



# Emerging Evidence Alert October 2020

This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics. It provides a review of recent journal articles and relevant content related to Comcare’s five research themes: Fostering Work Participation; Building Employer Capability; Adapting to the Future of Work; Guiding and Supporting Mental Health and Wellbeing; and Enabling Healthy and Safe Workplaces. Collated articles were published in September 2020 only.

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## Workplace interventions to manage insomnia

Insomnia is the most common sleep disorder worldwide and a significant occupational risk for workers and workplaces. A [recent systematic review and meta-analysis of 34 studies](#) examines the effectiveness of workplace interventions to manage insomnia, and their potential positive impact on work-related factors like presenteeism, sick leave and work-related burnout.

Cognitive behavioural therapy, health programs, meditation techniques and self-help strategies are effective workplace interventions to improve quality of sleep and decrease the symptoms of insomnia for workers, while also raising awareness about the condition. Investing in workplace policies that aim to improve worker sleep behaviour and attitudes can help ensure greater work productivity and workplace safety.

For more information and guidance about managing psychosocial hazards (such as insomnia and fatigue) in the workplace visit the [Comcare website](#) or [Safe Work Australia website](#).

## Latest COVID-19 research and guidance

The Emerging Evidence Alert now includes a new section to provide you with the latest COVID-19 research and the pandemic’s impacts on workers and workplaces.

In this edition you will find [recent research](#) on the psychological distress of non-health workers in Spain during the COVID-19 pandemic when performing essential roles and working from home. The research finds 65% of people report psychological distress. These findings highlight the importance of supporting workers’ positive attitudes, such as ensuring they have access to the latest information about COVID-19, including guidance on how to manage its potential risks.

For more guidance and the latest work health and safety information on COVID-19, visit the [Comcare website](#). For industry specific COVID-19 information, visit the [Safe Work Australia website](#).

## 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

#### Return to work for mental ill-health: A scoping review exploring the impact and role of return-to-work coordinators

**Purpose** This scoping review was completed to explore the role and impact of having a return-to-work (RTW) coordinator when dealing with individuals with common mental ill-health conditions. **Methods** Peer reviewed articles published in English between 2000 and 2018 were considered. Our research team reviewed all articles to determine if an analytic focus on RTW coordinator and mental ill-health was present; consensus on inclusion was reached for all articles. Data were extracted for all relevant articles and synthesized for outcomes of interest. **Results** Our search of six databases yielded 1798 unique articles; 5 articles were found to be relevant. The searched yielded only quantitative studies. Of those, we found that studies grouped mental ill-health conditions together, did not consider quality of life, and used different titles to describe RTW coordinators. Included articles described roles of RTW coordinators but did not include information on their strategies and actions. Included articles suggest that RTW interventions for mental ill-health that utilize a RTW coordinator may result in delayed time to RTW. **Conclusions** Our limited findings suggest that interventions for mental ill-health that employ RTW coordinators may be more time consuming than conventional approaches and may not increase RTW rate or worker's self-efficacy for RTW. Research on this topic with long-term outcomes and varied research designs (including qualitative) is needed, as well as studies that clearly define RTW coordinator roles and strategies, delineate results by mental health condition, and address the impact of RTW coordinators on workers' quality of life.

**MacEachen et al. 2020.**

**Journal of Occupational Rehabilitation, vol. 30, no. 3.**

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**Keywords:** Case management; mental health; return to work; return to work coordinators; scoping review.

**Evidence Level:** 1A

**Link:** <https://link.springer.com/article/10.1007%2Fs10926-020-09873-3>

### Presenteeism and Absenteeism

#### Predicting long-term sickness absence and identifying subgroups among individuals without an employment contract

**Purpose** Today, decreasing numbers of workers in Europe are employed in standard employment relationships. Temporary contracts and job insecurity have become more common. This study among workers without an employment contract aimed to (i) predict risk of long-term sickness absence and (ii) identify distinct subgroups of sick-listed workers. **Methods** 437 individuals without an employment contract who were granted a sickness absence benefit for at least two weeks were followed for 1 year. We used registration data and self-reported questionnaires on socio-demographics, work-related, health-related and psychosocial factors. Both were retrieved from the databases of the Dutch Social Security Institute and measured at the time of entry into the benefit. We used logistic regression analysis to identify individuals at risk of long-term sickness absence. Latent class analysis was used to identify homogenous subgroups of individuals. **Results** Almost one-third of the study population (n = 133; 30%) was still at sickness absence at 1-year follow-up. The final prediction model showed fair discrimination between individuals with and without long-term sickness absence (optimism adjusted AUC to correct for overfitting = 0.761). Four subgroups of individuals were identified based on predicted risk of long-term sickness absence, self-reported expectations about recovery and return to work, reason of sickness absence and coping skills. **Conclusion** The logistic regression model could be used to identify individuals at risk of long-term sickness absence. Identification of risk groups can aid professionals to offer tailored return to work interventions.

**Louwerse et al. 2020.**

**Journal of Occupational Rehabilitation, vol. 30, no. 3.**

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**Keywords:** Latent class analysis; long-term sickness absence; longitudinal cohort; prediction models.

**Evidence Level:** 4A

**Link:** <https://link.springer.com/article/10.1007%2Fs10926-020-09874-2>

## Working Hours

### **Gender differences in the volatility of work hours and labor demand**

This paper examines the role of heterogeneity in a real business cycle model, which traditionally has not fully captured the relative volatility of hours to output. Men and women have different cyclical volatilities in hours worked, which is robust to different filtering methods. This empirical regularity is used to motivate a standard RBC model augmented to allow for two different agents following Jaimovich et al. (2013). These two agents have identical utility functions but face different elasticities of labour demand due to their different complementarities with capital. These estimated elasticities find that women are more complementary to capital. The calibrated model generates the cyclical volatility of work hours by gender and for the total hours worked that matches the U.S. data better than the traditional representative agent model. I then explore other extensions to this model including investigating the stability of the estimated labour demand elasticities and allowing for various Frisch elasticities of labour supply. This paper demonstrates that allowing for even broad levels of heterogeneity in a simple framework can increase the model's tractability with the data. Since gender is important to explain U.S. business cycle dynamics, we need to carefully consider heterogeneity when analysing counter-cyclical economic policy, as it may not have symmetric effects across assorted groups.

**Guisinger et al. 2020.**

**Journal of Macroeconomics, vol. 66.**

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

**Keywords:** Gender; heterogeneity; labor demand; RBC.

**Evidence Level:** 6B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7489220/>

### **The effect of exposure to long working hours on stroke: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury**

**Background:** The World Health Organization (WHO) and the International Labour Organization (ILO) are developing joint estimates of the work-related burden of disease and injury (WHO/ILO Joint Estimates), with contributions from a large network of individual experts. Evidence from mechanistic data and prior studies suggests that exposure to long working hours may cause stroke. In this paper, we present a systematic review and meta-analysis of parameters for estimating the number of deaths and disability-adjusted life years from stroke that are attributable to exposure to long working hours, for the development of the WHO/ILO Joint Estimates. **Objectives:** We aimed to systematically review and meta-analyse estimates of the effect of exposure to long working hours (three categories: 41-48, 49-54 and  $\geq 55$  h/week), compared with exposure to standard working hours (35-40 h/week), on stroke (three outcomes: prevalence, incidence, and mortality). **Data sources:** A protocol was developed and published, applying the Navigation Guide to systematic reviews as an organizing framework where feasible. We searched electronic databases for potentially relevant records from published and unpublished studies, including Ovid MEDLINE, PubMed, EMBASE, Scopus, Web of Science, CISDOC, PsycINFO, and WHO ICTRP. We also searched grey literature databases, Internet search engines, and organizational websites; hand-searched reference lists of previous systematic reviews; and consulted additional experts. **Study eligibility and criteria:** We included working-age ( $\geq 15$  years) individuals in the formal and informal economy in any WHO and/or ILO Member State but excluded children (aged  $< 15$  years) and unpaid domestic workers. We included randomized controlled trials, cohort studies, case-control studies and other non-randomized intervention studies with an estimate of the effect of exposure to long working hours (41-48, 49-54 and  $\geq 55$  h/week), compared with exposure to standard working hours (35-40 h/week), on stroke (prevalence, incidence or mortality). **Study appraisal and synthesis methods:** At least two review authors independently screened titles and abstracts against the eligibility criteria at a first review stage and full texts of potentially

eligible records at a second stage, followed by extraction of data from qualifying studies. Missing data were requested from principal study authors. We combined relative risks using random-effects meta-analysis. Two or more review authors assessed the risk of bias, quality of evidence and strength of evidence, using the Navigation Guide and GRADE tools and approaches adapted to this project. **Results:** Twenty-two studies (20 cohort studies, 2 case-control studies) met the inclusion criteria, comprising a total of 839,680 participants (364,616 females) in eight countries from three WHO regions (Americas, Europe, and Western Pacific). The exposure was measured using self-reports in all studies, and the outcome was assessed with administrative health records (13 studies), self-reported physician diagnosis (7 studies), direct diagnosis by a physician (1 study) or during a medical interview (1 study). The outcome was defined as an incident non-fatal stroke event in nine studies (7 cohort studies, 2 case-control studies), incident fatal stroke event in one cohort study and incident non-fatal or fatal ("mixed") event in 12 studies (all cohort studies). Cohort studies were judged to have a relatively low risk of bias; therefore, we prioritized evidence from these studies, but synthesised evidence from case-control studies as supporting evidence. For the bodies of evidence for both outcomes with any eligible studies (i.e. stroke incidence and mortality), we did not have serious concerns for risk of bias (at least for the cohort studies). Eligible studies were found on the effects of long working hours on stroke incidence and mortality, but not prevalence. Compared with working 35-40 h/week, we were uncertain about the effect on incidence of stroke due to working 41-48 h/week (relative risk (RR) 1.04, 95% confidence interval (CI) 0.94-1.14, 18 studies, 277,202 participants,  $I^2$  0%, low quality of evidence). There may have been an increased risk for acquiring stroke when working 49-54 h/week compared with 35-40 h/week (RR 1.13, 95% CI 1.00-1.28, 17 studies, 275,181 participants,  $I^2$  0%,  $p$  0.04, moderate quality of evidence). Compared with working 35-40 h/week, working  $\geq$ 55 h/week may have led to a moderate, clinically meaningful increase in the risk of acquiring stroke, when followed up between one year and 20 years (RR 1.35, 95% CI 1.13 to 1.61, 7 studies, 162,644 participants,  $I^2$  3%, moderate quality of evidence). Compared with working 35-40 h/week, we were very uncertain about the effect on dying (mortality) of stroke due to working 41-48 h/week (RR 1.01, 95% CI 0.91-1.12, 12 studies, 265,937 participants,  $I^2$  0%, low quality of evidence), 49-54 h/week (RR 1.13, 95% CI 0.99-1.29, 11 studies, 256,129 participants,  $I^2$  0%, low quality of evidence) and 55 h/week (RR 1.08, 95% CI 0.89-1.31, 10 studies, 664,647 participants,  $I^2$  20%, low quality of evidence). Subgroup analyses found no evidence for differences by WHO region, age, sex, socioeconomic status and type of stroke. Sensitivity analyses found no differences by outcome definition (exclusively non-fatal or fatal versus "mixed") except for the comparison working  $\geq$ 55 h/week versus 35-40 h/week for stroke incidence ( $p$  for subgroup differences: 0.05), risk of bias ("high"/"probably high" ratings in any domain versus "low"/"probably low" in all domains), effect estimate measures (risk versus hazard versus odds ratios) and comparator (exact versus approximate definition). **Conclusions:** We judged the existing bodies of evidence for human evidence as "inadequate evidence for harmfulness" for all exposure categories for stroke prevalence and mortality and for exposure to 41-48 h/week for stroke incidence. Evidence on exposure to 48-54 h/week and  $\geq$ 55 h/week was judged as "limited evidence for harmfulness" and "sufficient evidence for harmfulness" for stroke incidence, respectively. Producing estimates for the burden of stroke attributable to exposures to working 48-54 and  $\geq$ 55 h/week appears evidence-based, and the pooled effect estimates presented in this systematic review could be used as input data for the WHO/ILO Joint Estimates.

**Descatha et al. 2020.**

**Environmental International, vol. 142.**

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**Keywords:** Global Burden of Disease; long working hours; meta-analysis; occupational; stroke; systematic review.

**Evidence Level:** 6A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0160412019332118?via%3Dihub>

## Building Employer Capability

### Wellness Programs

### **"I Get That Spirit in Me"- Mentally empowering workplace health promotion for female workers in low-paid jobs during menopause and midlife**

During menopause and midlife, female workers, particularly those in low-paid jobs, experience more occupational health problems than other groups of workers. Workplace interventions are often lacking, however. In the Netherlands, a workplace health promotion intervention-the work-life program (WLP)-has been developed to support female workers. Here, we tailored the WLP to the needs of female workers in low-paid jobs working at Amsterdam University Medical Center. In an exploratory mixed-methods study with a convergent design, among 56 participants, we used questionnaires before and after the intervention and semi-structured, in-depth interviews to address the following research question: What is the impact of the WLP on the women's health and work functioning? Our quantitative data showed that menopausal symptoms improved significantly after the WLP. Our qualitative data, derived from 12 participants, showed that the WLP initiated a process of mental empowerment that initiated positive changes in four domains: behavior, physical health, mental wellbeing, and in the workplace. Taken with caution, our findings suggest that the WLP mentally empowers female workers to make choices that enhance their health and wellbeing, both at work and in their private lives, as summarized in the quote of one participant: "I get that spirit in me!".

**Verburgh et al. 2020.**

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

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**Keywords:** Intervention; low-paid jobs; menopause; midlife; women; work; workplace health promotion.

**Evidence Level:** 5A

**Link:** <https://www.mdpi.com/1660-4601/17/18/6462>

### **Are workplace health promotion programmes effective for all socioeconomic groups? A systematic review**

Decreasing socioeconomic health inequalities is considered an important policy priority in many countries. Workplace health promotion programmes (WHPPs) have shown modest improvements in health behaviour. This systematic review aims to determine the presence and magnitude of socioeconomic differences in effectiveness and the influence of programme characteristics on differential effectiveness of WHPPs. Three electronic databases were searched for systematic reviews published from 2013 onwards and for original studies published from 2015 onwards. We synthesized the reported socioeconomic differences in effectiveness of WHPPs on health behaviours, and calculated effectiveness ratios by dividing the programme effects in the lowest socioeconomic group by the programme effects in the highest socioeconomic group. Thirteen studies with 75 comparisons provided information on the effectiveness of WHPPs across socioeconomic groups. Ten studies with 54 comparisons reported equal effectiveness and one study with 3 comparisons reported higher effectiveness for lower socioeconomic groups. Quantitative information on programme effects was available for six studies with 18 comparisons, of which 13 comparisons showed equal effectiveness and 5 comparisons showed significantly higher effect sizes among workers in low socioeconomic position. The differential effectiveness of WHPPs did not vary across programme characteristics. In this study no indications are found that WHPPs increase socioeconomic inequalities in health behaviour. The limited quantitative information available suggests that WHPPs may contribute to reducing socioeconomic inequalities. Better insight is needed on socioeconomic differences in effectiveness of WHPPs to develop strategies to decrease socioeconomic inequalities in health in the workforce.

**Van De Ven et al. 2020.**

**Occupational and Environmental Medicine, vol. 77, no. 9.**

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**Keywords:** Health promotion; occupational health practice; public health.

**Evidence Level:** 1A

**Link:** <https://oem.bmj.com/content/77/9/589.long>

### **Socioeconomic inequalities in effectiveness of and compliance to workplace health promotion programs: An individual participant data (IPD) meta-analysis**

**Background:** This individual patient data (IPD) meta-analysis aimed to investigate socioeconomic inequalities in effectiveness on healthy behavior of, and compliance to, workplace health promotion programs. **Methods:** Dutch (randomized) controlled trials were identified and original IPD were retrieved and harmonized. A two-stage meta-analysis was conducted where linear mixed models were performed per study (stage 1), after which individual study effects were pooled (stage 2). All models were adjusted for baseline values of the outcomes, age and gender. Intervention effects were assessed on physical activity, diet, alcohol use, and smoking. Also, we assessed whether effects differed between participants with low and high program compliance and. All analyses were stratified by socioeconomic position. **Results:** Data from 15 studies (n = 8709) were harmonized. Except for fruit intake (beta: 0.12 [95% CI 0.08 0.15]), no effects were found on health behaviors, nor did these effects differ across socioeconomic groups. Only participants with high compliance showed significant improvements in vigorous and moderate-to-vigorous physical activity, and in more fruit and less snack intake. There were no differences in compliance across socioeconomic groups. **Conclusions:** Workplace health promotion programs were in general not effective. Neither effectiveness nor compliance differed across socioeconomic groups (operationalized by educational level). Even though stronger effects on health behavior were found for participations with high compliance, effects remained small. The results of the current study emphasize the need for new directions in health promotion programs to improve healthy behavior among workers, in particular for those in lower socioeconomic position.

**Coenen et al. 2020.**

**International Journal of Behavioral Nutrition and Physical Activity, vol. 17, no. 1.**

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**Keywords:** Healthy lifestyle; meta analysis; risk reduction behavior; workplace.

**Evidence Level:** 1A

**Link:** <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-020-01002-w>

### **The effectiveness of body age-based intervention in workplace health promotion: Results of a cohort study on 9851 Danish employees**

**Introduction:** The aging population emphasize the need for effective health promotion interventions. The workplace is a prioritized setting for health promotion to reach widely within a population. Body age can be used as a health-risk estimate and as a motivational tool to change health behaviour. In this study we investigate body age-based intervention including motivational interview and its effect on health, when applied to real life workplace health promotion. **Material and methods:** Body age-based intervention was performed in 90 companies on 9851 Danish employees from 2011-2017. Metabolic risk factors were assessed, body age score was determined and an individualized motivational interview was conducted at baseline and follow-up. Change in body age score, single risk factors, smoking habits and metabolic syndrome were analysed. The body age score is a composite score comprising 11 weighted variables. A body age score  $\leq 0$  is preferred, as this elicit a younger/healthier or equal body age compared to chronological age. **Results:** At 1.3 year follow-up the unhealthiest employees were less likely to participate. Within follow-up participants (39%, n = 3843) body age had improved by a decline in mean body age score of -0.6 and -0.7 years for men and women, respectively ( $p < 0.001$ ). Number of employees with metabolic syndrome had decreased from 646 at baseline to 557 at follow-up ( $p = 0.005$ ) and 42% of smokers had quit smoking ( $p < 0.001$ ). **Conclusion:** On the basis of this study, we suggest that body age assessment motivates to participate in workplace health promotion, affect high risk behaviour such as smoking thus have potential in public health promotion.

**Husted et al. 2020.**

**PLoS One, vol. 15, no. 9.**

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**Keywords:** Health promotion; aging; workplace; Danish; employees; intervention.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239337>

## **Organisational Issues**



### **Female employees' perception of breastfeeding support in the workplace, public universities in Spain: A multicentric comparative study**

**Background:** Despite scientific recommendations for exclusive breastfeeding until 6 months of age and complementary breastfeeding to 2 years of age, breastfeeding abandonment rates increase with time, and one of the main reasons is that women go back to work. **Aim:** To analyze the perception of support of breastfeeding workers to continue breastfeeding at two Spanish universities, and associated factors.

**Methods:** A multicentre retrospective cross-sectional comparative study conducted in a population of 777 female workers at the Universidad de Sevilla (US) and the Universitat Jaume I (UJI) in Spain using an online questionnaire. **Results:** The response rate was 38.74% ( $n = 301$ ). Of all the participants, 57.8% continued breastfeeding after returning to work. The factors associated with continuing breastfeeding for longer were the university having a breastfeeding support policy and special accommodation ( $p < 0.001$ ); participating in breastfeeding support groups ( $p < 0.001$ ); intending to continue breastfeeding after returning to work ( $p < 0.001$ ); knowing the occupational legislation in force ( $p = 0.009$ ); having a female supervisor ( $p = 0.04$ ).

**Conclusion:** Breastfeeding support initiatives and having special accommodation to pump and preserve breast milk after returning to work are associated with a longer duration of female workers' breastfeeding. **Cervera-Gasch et al. 2020.**

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

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**Keywords:** Breastfeeding; breastfeeding barrier; breastfeeding support; female employment; lactation; workplace.

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/1660-4601/17/17/6402>

### **Job Design**

#### **Working at home and elsewhere: Daily work location, telework, and travel among United States knowledge workers**

The mediation of work practices by information and communication technologies enables knowledge workers to telework from remote non-office locations such as their homes, or to work nomadically from multiple locations in a day. This paper uses data from the American Time Use Survey to explore the relationship between daily work locations and travel in the United States from 2003 to 2017. Outcome variables include travel duration and travel during peak periods. Home is by far the most common non-office work location, but working from other people's homes, cafés/libraries, vehicles, and combinations of multiple locations are also measured. Findings show that working from home only on a day (full-day telework) decreases daily travel duration and increases the likelihood of avoiding peak hour travel for both work and non-work related travel. However, for homeworkers who also conduct work from their workplace on the same day (part-day telework), there is no reduction in daily travel time, and avoiding peak hour travel is limited to work-related travel. Working from other locations such as cafés/libraries or vehicles increases the likelihood of not traveling at peak hours. Findings also indicate that morning peak periods are more affected by work location decisions than evening peak periods. A survival analysis of daily departure times for both full-day and part-day homeworkers provides insight into this mechanism. We conclude on the basis of these findings that demand management policies and peak avoidance incentives would be more effective if they encourage both temporal and spatial flexibility for employees when partnering with regional employers.

**Stiles et al. 2020.**

**Transportation.**

**User License:** *PMC Open Access Subset*

**Keywords:** Nomadic work; peak hour avoidance; peak hour travel; telework; travel demand management.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7474569/>

#### **A work-life conflict perspective on telework**

Telework has been promoted for decades as one of the traffic demand management policies to alleviate congestion during peak periods and reduce work-related trips, along with other benefits. However, less clear is the role played by life stages (i.e., gender, marital status and parenthood) on telework behavior. This study investigated to which extent telework frequency associated with life stages, and how these associations could be explained based on the work-life conflict perspective. Representative data were obtained from German Microcensus 2010 (N = 188,081 participants). The outcome variable was measured as ordered telework participation levels (i.e., never, infrequently and frequently). After testing for multicollinearity, a zero-inflated ordered probit regression model was applied to assess the associations between telework and family-life stages, while adjusting for individual, household, job-related and environmental characteristics. Results suggest that life stages associate with telework behaviour in a complex way. Three patterns have been distinguished. Specifically, irrespective of gender and marital status, parents are less likely to telework compared to those without children. Regarding individuals without children, single individuals are more likely to telework than married ones, and males more likely than females. In contrast, for individuals with children, the partnered parents are more likely to telework than single parents, and females more likely than males. Our findings suggest that as the most important feature in family-life stages, children play a vital role in telework behaviour. It not only increases both work-to-family conflict and family-to-work conflict, but also triggers housework re-division within couples and aggravates gender differences. Policies that support formal childcare resources could relieve the family-to-work conflict and encourage people to work at home.

**Zhang et al. 2020.**

**Transportation Research Part A: Policy and Practice, vol. 141.**

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

**Keywords:** Family life stages; German Microcensus 2010; telework; work-life balance; work-life conflict; zero-inflated ordered probit regression.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7509537/>

## Shift Work

### Impact of shift work on the eating pattern, physical activity and daytime sleepiness among Chilean healthcare workers

We evaluated the eating pattern, physical activity, and daytime sleepiness level in Chilean shift workers. Fifty, middle-aged adult health workers from a public hospital in Santiago, Chile, were included: a group undergoing shift work (shift workers, including at least one "night shift" and one "long day", n = 33), and day workers under traditional schedule (from 8:00 to 17:00h, n = 17). Body composition, physical activity, and daytime sleepiness levels, and diet characteristics (diet composition, meals' timing, and diet quality) were assessed. Despite similar total energy intake, shift worker showed lower carbohydrate (% of energy) and higher protein intake (both  $P < 0.01$ ), decreased diet quality, an irregular eating pattern, and delayed meal timing (all  $P < 0.05$ ). Physical activity and daytime sleepiness levels did not differ between groups. Findings from this first Chilean study in healthcare shift workers support the fact that meal timing and diet quality appear as critical factors for upcoming intervention studies in this group.

**Farías et al. 2020.**

**Safety and Health at Work, vol. 11, no. 3.**

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**Keywords:** Daytime sleepiness; diet quality; meal timing; physical activity; shift work.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120303061?via%3Dihub>

### How to schedule night shift work in order to reduce health and safety risks

**Objectives:** This discussion paper aims to provide scientifically based recommendations on night shift schedules, including consecutive shifts, shift intervals and duration of shifts, which may reduce health and

safety risks. Short-term physiological effects in terms of circadian disruption, inadequate sleep duration and quality, and fatigue were considered as possible links between night shift work and selected health and safety risks, namely, cancer, cardio-metabolic disease, injuries, and pregnancy-related outcomes. **Method:** In early 2020, 15 experienced shift work researchers participated in a workshop where they identified relevant scientific literature within their main research area. **Results:** Knowledge gaps and possible recommendations were discussed based on the current evidence. The consensus was that schedules which reduce circadian disruption may reduce cancer risk, particularly for breast cancer, and schedules that optimize sleep and reduce fatigue may reduce the occurrence of injuries. This is generally achieved with fewer consecutive night shifts, sufficient shift intervals, and shorter night shift duration. **Conclusions:** Based on the limited, existing literature, we recommend that in order to reduce the risk of injuries and possibly breast cancer, night shift schedules have: (i)  $\leq 3$  consecutive night shifts; (ii) shift intervals of  $\geq 11$  hours; and (iii)  $\leq 9$  hours shift duration. In special cases – e.g., oil rigs and other isolated workplaces with better possibilities to adapt to daytime sleep - additional or other recommendations may apply. Finally, to reduce risk of miscarriage, pregnant women should not work more than one night shift in a week.

**Garde et al. 2020.**

**Scandinavian Journal of Work and Environmental Health, vol. 3920.**

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**Keywords:** Night shift; shift work; health; safety.

**Evidence Level:** 6A

**Link:** [https://www.sjweh.fi/show\\_abstract.php?abstract\\_id=3920](https://www.sjweh.fi/show_abstract.php?abstract_id=3920)

### **Relationship between sleep and hedonic appetite in shift workers**

Short and/or poor sleep are established behavioral factors which can contribute to excess food intake, and emerging evidence suggests that disturbed circadian rhythms may also impact food intake regulation. Together, disturbed sleep and circadian rhythms may help explain the excess risk for obesity seen in shift workers. To date, however, the details of how shift work may impact food intake regulation are still not fully defined. Here we examined the relationship between sleep characteristics and hedonic control of appetite in shift workers. A total of 63 shift workers (mean (M) age: 36.7 years, standard deviation (SD): 12.0; 59% women) completed an online survey comprising self-reported measures of body weight regulation, sleep (Pittsburgh Sleep Quality Index, Sleep Hygiene Index), and hedonic control of appetite (Food Craving Inventory, Power of Food Scale). Seventy-one percent reported some weight change since starting shift work, and 84% of those reported weight gain (M = +11.3 kg, SD = 9.1). Worse sleep quality and shorter sleep duration were associated with more food cravings, and worse sleep quality and hygiene were associated with higher appetitive drive to consume palatable food (greater hedonic drive). This preliminary study suggests hedonic pathways are potentially contributing to weight gain in shift workers with disturbed sleep.

**Vidafar et al. 2020.**

**Nutrients, vol. 12, no. 9.**

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**Keywords:** Appetite; cravings; diet; food intake; obesity; shift work; sleep.

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/2072-6643/12/9/2835>

### **Association between night-shift work, sleep quality and health-related quality of life: A cross-sectional study among manufacturing workers in a middle-income setting**

**Objectives:** Night-shift work may adversely affect health. This study aimed to determine the impact of night-shift work on health-related quality of life (HRQoL), and to assess whether sleep quality was a mediating factor. **Design:** A cross-sectional study. **Setting:** 11 manufacturing factories in Malaysia. **Participants:** 177 night-shift workers aged 40-65 years old were compared with 317 non-night-shift workers. **Primary and secondary outcomes:** Participants completed a self-administered questionnaire on socio-demographics and lifestyle factors, 12-item Short Form Health Survey V.2 (SF-12v2) and the Pittsburgh Sleep Quality Index (PSQI). The Baron and Kenny's method, Sobel test and multiple mediation model with bootstrapping were applied to determine whether PSQI score or its components mediated the

association between night-shift work and HRQoL. **Results:** Night-shift work was associated with sleep impairment and HRQoL. Night-shift workers had significantly lower mean scores in all the eight SF-12 domains ( $p < 0.001$ ). Compared with non-night-shift workers, night-shift workers were significantly more likely to report poorer sleep quality, longer sleep latency, shorter sleep duration, sleep disturbances and daytime dysfunction ( $p < 0.001$ ). Mediation analyses showed that PSQI global score mediated the association between night-shift work and HRQoL. 'Subjective sleep quality' (indirect effect = -0.24, SE = 0.14 and bias corrected (BC) 95% CI -0.58 to -0.01) and 'sleep disturbances' (indirect effect = -0.79, SE = 0.22 and BC 95% CI -1.30 to -0.42) were mediators for the association between night-shift work and physical well-being, whereas 'sleep latency' (indirect effect = -0.51, SE = 0.21 and BC 95% CI -1.02 to -0.16) and 'daytime dysfunction' (indirect effect = -1.11, SE = 0.32 and BC 95% CI -1.86 to -0.58) were mediators with respect to mental well-being. **Conclusion:** Sleep quality partially explains the association between night-shift work and poorer HRQoL. Organisations should treat the sleep quality of night-shift workers as a top priority area for action to improve their employees' overall wellbeing.

**Lim et al. 2020.**

**BMJ Open, vol. 10, no. 9.**

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**Keywords:** Quality of life; shift work; sleep quality; wellbeing.

**Evidence Level:** 4A

**Link:** <https://bmjopen.bmj.com/content/10/9/e034455.long>

### **Exploring the role of shift work in the self-reported health and wellbeing of long-term and assisted-living professional caregivers in Alberta, Canada**

**Background:** Numerous studies have found negative outcomes between shift work and physical, emotional, and mental health. Many professional caregivers are required to work shifts outside of the typical 9 am to 5 pm workday. Here, we explore whether shift work affects the health and wellbeing of long-term care (LTC) and assisted-living (AL) professional caregivers. **Method:** The Caring for Professional Caregivers research study was conducted across 39 LTC and AL facilities in Alberta, Canada. Of the 1385 questionnaires distributed, 933 surveys (67.4%) were returned completed. After identifying 49 questions that significantly explained variances in the reported health status of caregivers, we examined whether there was a relationship between these questions and reported health status of caregivers working night shifts. **Results:** We found significant differences between responses from those working different shifts across six of seven domains, including physical health, health conditions, mental/emotional health, quality of life, and health behaviors. In particular, we found that night shift caregivers were more likely to report incidents of poor health (i.e., they lacked energy, had regular presences of neck and back pain, regular or infrequent incidents of fatigue or low energy, had difficulty falling asleep, and that they never do exercise) and less likely to report incidents of good health (i.e., did not expect their health to improve, were not satisfied with their health, do not have high self-esteem/were happy, were unhappy with their physical appearance, and do not get a good night's sleep), compared to caregivers working other shifts.

**Conclusions:** Our study shows that professional caregivers working the night shift experience poor health status, providing further evidence that night shift workers' health is at risk. In particular, caregivers reported negative evaluations of their physical, mental/emotional health, lower ratings of their quality of life, and negative responses to questions concerning whether they engage in healthy behaviors. Our findings can support healthcare stakeholders outline future policies that ensure caregivers are adequately supported so that they provide quality care.

**Awosoga et al. 2020.**

**Human Resources for Health, vol. 18, no. 1.**

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

**Keywords:** Health status; professional caregivers; shiftwork; wellbeing.

**Evidence Level:** 4A

**Link:** <https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-020-00515-6>

## **Management and Leadership**

### **Facilitators and barriers surrounding the role of administration in employee job satisfaction in long-term care facilities: A systematic review**

Previous literature has shown how associate engagement has positively impacted on productivity, job satisfaction, safety, retention, consumer sentiment, and financial performance in hospitals and healthcare systems. However, a lack of research showing the relationship between associate engagement and job satisfaction within the long-term care environment has existed. Our objective was to investigate characteristics within the long-term care environment that promote and detract from associate job satisfaction and extrapolate the best practices in maintaining job satisfaction and engagement. This systematic review queried CINAHL, PubMed (MEDLINE), and Academic Search Ultimate databases for peer-reviewed publications for facilitators and barriers commensurate with employee job satisfaction in long-term care facilities using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and the Kruse Protocols. The authors identified 11 facilitators for job satisfaction and 18 barriers to job satisfaction in the 60 selected articles. The top four facilitators were Supportive Leadership, Capable and Motivated Employees, Positive Organizational Values, and Social Support Mechanisms. The top four barriers were condescending management style, high job demands, lack of self-care, and lack of training with medically complex patients. The systematic review revealed the importance of maintaining satisfied employees in the long-term care workplace through an emphasis leadership and on the facilitators identified to best serve their associates and improve care for residents.

**Lee et al. 2020.**

**Healthcare (Basel), vol. 8, no. 4.**

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**Keywords:** Assisted living; associate engagement; job satisfaction; long-term care; nursing homes; older adults.

**Evidence Level:** 1A

**Link:** <https://www.mdpi.com/2227-9032/8/4/360>

## **Work Ability**

### **Personal resources and personal demands for work engagement: Evidence from employees in the service industry**

Conventional studies have widely demonstrated that individuals' engagement at work depends on their personal resources, which are affected by environmental influences, especially those derived from the workplace and home domains. In this study, we examine whether a change in work engagement may be based on individuals' decisions in managing their personal resources. We use the conservation of resources (COR) theory to explain how personal resources and personal demands at home can influence work engagement through personal resources and personal demands at work. We conducted a daily diary study involving a group of 97 Chinese employees (N = 97) from a range of different service settings for 2 consecutive weeks (N = 1358) and evaluated their daily work engagement using manager ratings. The findings support the hypothesized mediating effects of personal resources and personal demands at work on personal resources and personal demands at home and work engagement.

**Chen et al. 2020.**

**International Journal of Hospitality Management.**

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

**Keywords:** Chinese; conservation of resources theory; personal demands; personal resources; work engagement; work-home interface.

**Evidence Level:** 5B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7326455/>

## **Adapting to the Future of Work**

### **Aging Workforce**

## **Work participation and risk factors for health-related job loss among older workers in the Health and Employment after Fifty (HEAF) study: Evidence from a 2-year follow-up period**

**Introduction:** Rapidly increasing population old age dependency ratios create a growing economic imperative for people to work to older ages. However, rates of older worker employment are only increasing slowly. Amongst a cohort of contemporary older workers, we investigated risk factors for health-related job loss (HRJL) over 2 years of follow-up. **Methods:** HEAF is a population-based cohort study of adults in England (aged 50-64 years at baseline) who provided information about socio-demographic characteristics, lifestyle, and work at baseline and annual follow-ups. Exits from paid work were mapped and risk factors for HRJL explored in a multiple-record survival dataset by Cox proportional hazards models. **Results:** 2475 (75%) men and 2668 (66%) women were employed; 115 (4.6%) men and 182 (6.8%) women reported HRJL. Employment as road transport drivers/in vehicle trades (men), or as teaching/education/nursing/midwifery professionals or in caring personal services (women), was more frequent among people exiting work for health-related versus non-health-related reasons. Principal socio-demographic and lifestyle risk factors for HRJL were: struggling financially (men and women); low physical activity (men); being overweight or obese, and current smoking (women). Mutually adjusted work-related risk factors for HRJL were job dissatisfaction, and not coping with the physical (hazard ratio [95% confidence interval]: men 5.34[3.40,8.39]; women 3.73[2.48,5.60]) or mental demands (women only, 2.02[1.38,2.96]) of work. **Conclusions:** Employment characteristics of contemporary older workers differ by sex. Job satisfaction and perceived ability to cope with the physical and mental demands of work are key determinants of HRJL which employers could potentially influence to enable work to older ages.

**Syddall et al. 2020.**

**PLoS One, vol. 15, no. 9.**

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**Keywords:** Work; health; work participation; health related job loss.

**Evidence Level:** 4A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239383>

## **Guiding and Supporting Mental Health and Wellbeing**

### **Mental Health**

#### **Role of a digital return-to-work solution for individuals with common mental disorders: Qualitative study of the perspectives of three stakeholder groups**

**Background:** Although effective return-to-work (RTW) interventions are not widely available for individuals with common mental disorders on sick leave, there is potential for transforming such interventions into a digital solution in an effort to make them more widely available. However, little is currently known about the viewpoints of different stakeholder groups, which are critical for successful development and implementation of a digital RTW intervention in health care services. **Objective:** The aim of this study was to examine stakeholder groups' perspectives on the role and legitimacy of a digital RTW solution called mWorks for individuals with common mental disorders who are on sick leave. **Methods:** A purposeful snowball sampling method was utilized to recruit respondents. Semi-structured individual and focus group interviews were conducted for stakeholder groups of service users, RTW professionals, and influential managers regarding their experiences, needs, and preferences for mWorks. Content analysis generated themes and categories that constituted the main findings. **Results:** The legitimacy of a digital RTW solution was high among all stakeholder groups since such a tool was perceived to enable service users to take control over their RTW process. This was mainly a product of accessible support and promotion of service user decision making, which had the potential to empower service users. All respondents stressed the importance of fostering a positive user experience with usability and emphasis on service user resources and strengths, as opposed to various limitations and shortcomings. Stakeholder groups highlighted critical content to facilitate RTW, such as the need to clarify a back-to-work plan, accompanied by an accessible RTW network and strategies for handling mental health problems. Implementation challenges primarily involved influential managers' concern of legislation incompatibility with innovative technology, and RTW professionals' concern of the possibility that digital solutions may replace them to a certain extent.

**Conclusions:** This formative research emphasizes the importance of shifting power from RTW professionals to service users. mWorks can play a role in mediating service user control over the RTW process, and thereby increase their empowerment. A digital RTW solution may facilitate the circumvention of implementation barriers associated with introducing evidence-based RTW interventions in a traditional RTW context.

**Engdahl et al. 2020.**

**JMIR Formative Research, vol. 4, no. 9.**

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**Keywords:** mHealth; mental health; qualitative method; quality improvement; vocational rehabilitation.

**Evidence Level:** 5A

**Link:** <https://formative.jmir.org/2020/9/e15625/>

### **A pilot evaluation of a smartphone application for workplace depression**

Interventions delivered via mobile apps show particular promise in tackling the burden of common mental disorders. Appropriately targeting these interventions to at-risk populations is critical to their success. This pilot study aimed to assess the usability, feasibility, acceptability, and preliminary effects of an app-based intervention designed to target depressive symptoms in a stressed working population. Anchored, a smartphone app including a 30-day program of mindfulness and cognitive and behavioural therapeutic components, was tested in a pre-post pilot study with participants recruited via social media advertisements. Eligible participants (N = 81) were Australian adults who were employed and reported elevated stress levels on a single-item screening measure. Follow-up assessment occurred 5 weeks after baseline. The primary outcome measure was change in depressive symptoms, with secondary outcomes measuring change in anxiety, wellbeing, stress, resilience, exercise, alcohol use, absenteeism, and work performance. User feedback and in-app data were analysed to assess engagement and intervention adherence. At follow-up, there were significant reductions in depressive symptoms ( $t_{61} = 6.35$ ;  $p < 0.001$ ) and anxiety symptoms ( $t_{60} = 7.35$ ;  $p < 0.001$ ), along with significantly reduced cases of likely new onset depression compared to baseline (24% vs. 6%,  $p = 0.012$ ). Significant improvements were also seen in wellbeing ( $t_{60} = -5.64$ ;  $p < 0.001$ ), resilience ( $t_{60} = -3.89$ ;  $p < 0.001$ ), stress ( $t_{61} = 11.18$ ;  $p < 0.001$ ), and alcohol use ( $t_{60} = 3.40$ ;  $p = 0.001$ ). Participants reported no significant changes in work performance, absenteeism or exercise. There were satisfactory levels of app usability, feasibility, and acceptability. Most participants found the app easy to use (93.2%), understood the app content well (83.0%), and rated the app highly or very highly overall (72.9%). User feedback suggestions were predominantly focused on improving app navigation and user interface. This pilot study provides encouraging evidence that Anchored has potentially beneficial effects, and is usable, feasible, and acceptable as an app-based intervention for the working population experiencing elevated stress. Further testing of Anchored in a randomised controlled trial is required to investigate its efficacy as an intervention for workplace mental ill-health.

**Collins et al. 2020.**

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

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

**Keywords:** Anxiety; depression; eHealth; mHealth; mental health; mobile app; prevention; smartphone; workplace.

**Evidence Level:** 5A

**Link:** <https://www.mdpi.com/1660-4601/17/18/6753>

### **Employment precariousness and mental health, understanding a complex reality: A systematic review**

Precarious employment has expanded during the last decades, but there is no full consensus on its definition, and its impact on mental health is not completely understood. The relevance of several micro- and macro-level variables in the association between precarious employment and mental health has not been fully addressed. This review has 2 aims: to identify scientific evidence on the relationship between various dimensions of precarious employment and mental health, and to synthesize the inclusion of a gender-sensitive perspective, context variables, workers' household variables, and the discussion of causal mechanisms underlying the association. The literature was searched in PubMed, EMBASE, Web of Science and PsycINFO including articles dated 2010-May 2018. A minimum of 2 independent reviewers assessed

each article regarding quality and eligibility criteria. The search retrieved 1522 papers, of which 54 (corresponding to 53 studies) met the inclusion criteria. Most of the studies analyzing job insecurity, temporariness and multidimensional approaches reported a significant association. Nevertheless, results for working time arrangements and downsizing are inconclusive. Around half of the studies included sex-stratified analyses and formulated contradictory conclusions. Overall, 7 studies considered workers' household situation and only 3 delivered significant results, and 16 described some of the potential pathways. There is evidence of an association between various precarious employment approaches and mental health problems. Further research (preferably longitudinal) should aim to discuss theoretical models explaining the pathways between precarious employment and mental health, including a gender-sensitive perspective, and integrating several levels of individual and contextual variables.

**Utzet et al. 2020.**

**International Journal of Occupational Medicine and Environmental Health, vol. 33, no. 5.**

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**Keywords:** Europe; gender; mental health; pathway; precarious employment; review.

**Evidence Level:** 1A

**Link:** <http://ijomeh.eu/Employment-precariousness-and-mental-health-understanding-a-complex-reality-a-systematic,123519,0,2.html>

### **Trajectories for post-traumatic stress disorder symptoms among local disaster recovery workers following the great east Japan earthquake: Group-based trajectory modelling**

**Background:** As many local municipality and medical workers were involved in disaster recovery duties following the Great East Japan Earthquake (GEJE) on March 11, 2011, the aim of this work was to elucidate the distinct trajectories for post-traumatic stress disorder (PTSD) symptoms and associated factors among these personnel. They confronted a diverse range of stressors both as survivors and as relief workers; however, little is known about their longitudinal PTSD symptoms. **Methods:** The participants were 745 local municipality and hospital medical workers [average age:  $43.6 \pm 9.5$  years, range: 20 - 66 years; 306 (59%) women] involved in disaster recovery duties following the GEJE. PTSD symptoms were measured using the Japanese version of the PTSD Checklist Specific Version (PCL-S) at four time points: 14, 30, 43, and 54 months after the GEJE. Using group-based trajectory modelling, distinct trajectories were elucidated.

**Results:** We identified five distinct PTSD symptoms profiles: resistance ( $n = 467$ , 62.7%), subsyndromal ( $n = 181$ , 24.3%), recovery ( $n = 47$ , 6.3%), fluctuating ( $n = 26$ , 3.5%), and chronic ( $n = 24$ , 3.2%). The trajectories differed according to the post-disaster working conditions and personal disaster experiences.

**Limitations:** Potential selection bias resulting from the limited number of participants who completed all waves. The survey was conducted in one region of the disaster area. **Conclusions:** The majority of participants remained stable, with a relatively small group classified as chronic and fluctuating. Our results highlight the importance of improved working conditions and sustained monitoring of workers responding to natural disasters.

**Sakuma et al. 2020.**

**Journal of Affective Disorders, vol. 242.**

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**Keywords:** Disaster medicine; disaster relief planning; earthquakes; post-traumatic stress disorders; Tsunamis.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0165032719333750?via%3Dihub>

## **Bullying and Harassment**

### **Work related sexual harassment and risk of suicide and suicide attempts: Prospective cohort study**

**Objective:** To analyse the relation between exposure to workplace sexual harassment and suicide, as well as suicide attempts. **Design:** Prospective cohort study. **Setting:** Sweden. **Participants:** 86 451 men and women of working age in paid work across different occupations responded to a self-report questionnaire



including exposure to work related sexual harassment between 1995 and 2013. The analytical sample included 85 205 people with valid data on sexual harassment, follow-up time, and age. **Main outcome measures:** Suicide and suicide attempts ascertained from administrative registers (mean follow-up time 13 years). **Results:** Among the people included in the respective analyses of suicide and suicide attempts, 125 (0.1%) died from suicide and 816 (1%) had a suicide attempt during follow-up (rate 0.1 and 0.8 cases per 1000 person years). Overall, 11 of 4095 participants exposed to workplace sexual harassment and 114 of 81 110 unexposed participants committed suicide, and 61/4043 exposed and 755/80 513 unexposed participants had a record of suicide attempt. In Cox regression analyses adjusted for a range of sociodemographic characteristics, workplace sexual harassment was associated with an excess risk of both suicide (hazard ratio 2.82, 95% confidence interval 1.49 to 5.34) and suicide attempts (1.59, 1.21 to 2.08), and risk estimates remained significantly increased after adjustment for baseline health and certain work characteristics. No obvious differences between men and women were found. **Conclusions:** The results support the hypothesis that workplace sexual harassment is prospectively associated with suicidal behaviour. This suggests that suicide prevention considering the social work environment may be useful. More research is, however, needed to determine causality, risk factors for workplace sexual harassment, and explanations for an association between work related sexual harassment and suicidal behaviour.

**Hanson et al. 2020.**

**BMJ, vol. 370.**

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**Keywords:** Work; sexual harassment; suicide; risk; suicide attempt.

**Evidence Level:** 4A

**Link:** <https://www.bmj.com/content/370/bmj.m2984.long>

## Psychosocial Issues – Risk Factors

**Psychosocial work environment explains the association of job dissatisfaction with long-term sickness absence: A one-year prospect study of Japanese employees**

**Background:** Using a 1-year prospective design, we examined the association of job dissatisfaction with long-term sickness absence lasting 1 month or more, before and after adjusting for psychosocial work environment (i.e., quantitative job overload, job control, and workplace social support) in Japanese employees. **Methods:** We surveyed 14,687 employees (7,343 men and 7,344 women) aged 20-66 years, who had not taken long-term sickness absence in the past 3 years, from a financial service company in Japan. The Brief Job Stress Questionnaire, including scales on job satisfaction and psychosocial work environment, was administered, and information on demographic and occupational characteristics (i.e., age, gender, length of service, job type, and employment position) was obtained from the personnel records of the surveyed company at baseline (July-August 2015). Subsequently, information on the start dates of long-term sickness absences was obtained during the follow-up period (until July 2016) from the personnel records. Cox's proportional hazard regression analysis was conducted. **Results:** After adjusting for demographic and occupational characteristics, those who perceived job dissatisfaction had a significantly higher hazard ratio of long-term sickness absence than those who perceived job satisfaction (hazard ratio 2.91; 95% confidence interval, 1.74-4.87). After additionally adjusting for psychosocial work environment, this association was weakened and no longer significant (hazard ratio 1.55; 95% confidence interval, 0.86-2.80). **Conclusions:** Our findings suggest that the association of job dissatisfaction with long-term sickness absence is spurious and explained mainly via psychosocial work environment.

**Inoue et al. 2020.**

**Journal of Epidemiology, vol. 30, no. 9.**

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**Keywords:** Absenteeism; job satisfaction; longitudinal studies; psychosocial job characteristics; survival analysis.

**Evidence Level:** 4B

**Link:** [https://www.jstage.jst.go.jp/article/jea/30/9/30\\_JE20190050/\\_article](https://www.jstage.jst.go.jp/article/jea/30/9/30_JE20190050/_article)

## **Which factors are related to Finnish home care workers' job satisfaction, stress, psychological distress and perceived quality of care? - A mixed method study**

**Background:** The desire to increase the role of home care in Finland has created problems in home care work. Working conditions have deteriorated, the quality of care experienced is low, and staff members suffer from time pressure and stress, amongst other things. The aim of this article is to explore the challenges, stressors, teamwork and management factors that are associated with home care staff members' well-being, job satisfaction and experienced care quality, and further, how staff members experience their work. **Methods:** A survey was sent to home care workers in two case organizations that participated in the study. In addition, semi-structured theme interviews with home care workers were conducted. The data from the survey was analysed using analysis of covariance, and interview data was analysed using the Grounded Theory-based method from Gioia et al. **RESULTS:** Respondents of the survey and the interview participants were mainly female practical nurses. The results from the survey showed, for example, that time pressure was associated with higher stress and psychological distress, and interruptions were associated with lower job satisfaction and higher stress. In addition, variables related to teamwork, such as participative safety, were shown to explain the variation in quality of care. The analysis of the interview data further brought up dissatisfaction with management practices, which seems to have led to a decrease in job satisfaction. Exhaustion and strain were present among staff members, which originated from an insufficient number of carers. **Conclusions:** Current working conditions and work practices in Finnish home care are experienced stressful. The results from this study indicate that having more autonomy at work was associated with job satisfaction, according to both analyses. Team climate and idea implementation were related to quality of care. Therefore, increasing self-organizing team practices might be a possible development method for improving working conditions and staff members' well-being. Implementing self-organizing team practices could possibly also attract employees to work in home care and prevent turnover.

**Ruotsalainen et al. 2020.**

**BMC Health Services Research, vol. 20, no. 1.**

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**Keywords:** Home care; job satisfaction; mixed methods; quality of care; self-organization.

**Evidence Level:** 5B

**Link:** <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-020-05733-1>

## **Enabling Healthy and Safe Workplaces**

### **Health and Wellbeing**

#### **Insomnia interventions in the workplace: A systematic review and meta-analysis**

The aim of this systematic review and meta-analysis was to identify and evaluate the impact of interventions to improve or reduce insomnia in the workforce through randomized clinical trials. Following the recommendations of the PRISMA and MARS statement, a systematic literature search was carried out on the PubMed, Web of Science, CINHAL, and PsycINFO databases, with no restrictions on the language or publication date. For the meta-analysis, a random-effects model and the Insomnia Severity Index were used as outcome measures. To assess the risk of bias and the quality of evidence, the Cochrane Collaboration tool and the GRADE method were used, respectively. Twenty-two studies were included in the systematic review and 12 studies in the meta-analysis, making a total of 14 intervention groups with a sample of 827 workers. Cognitive behavioral therapy was the most widely used intervention. According to the estimated difference between the means, a moderate effect for the reduction of insomnia symptoms after the intervention (MD -2.08, CI 95%: [-2.68, -1.47]) and a non-significant degree of heterogeneity were obtained ( $p = 0.64$ ;  $I^2 = 0\%$ ). The quality of the evidence and the risk of bias were moderate. The results suggest that interventions on insomnia in the workplace are effective for improving workers' health, and that improvements in the quality of sleep and a decrease in the symptoms of insomnia are produced,

thanks to an increase in weekly sleeping hours and a reduction in latency at sleep onset. As regards work, they also led to improvements in productivity, presenteeism, and job burnout.

**Vega-Escano et al. 2020.**

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

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**Keywords:** Insomnia; meta-analysis; occupational health; systematic review; workplace health.

**Evidence Level:** 1A

**Link:** <https://www.mdpi.com/1660-4601/17/17/6401>

### **Age, gender and season are good predictors of vitamin D status independent of body mass index in office workers in a subtropical region**

This study aimed at determining the prevalence and predictors of hypovitaminosis D (serum 25-hydroxyvitamin D < 30 ng/mL) among office workers in a subtropical region from an electronic hospital database. Totally, 2880 office workers aged 26-65 years who received health examinations with vitamin D status and total calcium concentrations at a tertiary referral center were retrospectively reviewed. Subjects were divided into groups according to genders, age (i.e., 26-35, 36-45, 46-55, 56-65), body-mass index (BMI) (i.e., obese BMI  $\geq$  30, overweight  $25 \leq$  BMI < 30, normal  $20 \leq$  BMI < 25, and underweight BMI < 20) and seasons (spring/winter vs. summer/autumn) for identifying the predictors of hypovitaminosis D. Corrected total calcium level <8.4 mg/dL is considered as hypocalcemia. Multivariate logistic regression demonstrated that females (AOR 2.33, (95% CI: 1.75, 3.09)), younger age (4.32 (2.98, 6.24), 2.82 (1.93, 4.12), 1.50 (1.03, 2.17)), and season (winter/spring) (1.55 (1.08, 2.22)) were predictors of hypovitaminosis D, whereas BMI was not in this study. Despite higher incidence of hypocalcemia in office workers with hypovitaminosis D ( $p < 0.001$ ), there was no association between vitamin D status and corrected total calcium levels. A high prevalence (61.9%) of hypovitaminosis D among office workers in a subtropical region was found, highlighting the importance of this occupational health issue.

**Wang et al. 2020.**

**Nutrients, vol. 12, no. 9.**

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**Keywords:** Age; gender; hypocalcemia; hypovitaminosis D; occupational health; season; subtropical.

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/2072-6643/12/9/2719>

### **Pregnancy vs. paycheck: A qualitative study of patient's experience with employment during pregnancy at high risk for preterm birth**

**Background:** Pregnant women with a history of preterm birth are at risk for recurrence, often requiring frequent prenatal visits for close monitoring and/or preventive therapies. Employment demands can limit uptake and adherence to recommended monitoring and preterm birth prevention therapies. **Method:** We conducted a qualitative descriptive study using in-depth interviews (IDIs) of pregnant women with a history of preterm birth. IDIs were conducted by trained qualitative interviewers following a semi-structured interview guide focused on uncovering barriers and facilitators to initiation of prenatal care, including relevant employment experiences, and soliciting potential interventions to improve prompt prenatal care initiation. The IDIs were analyzed via applied thematic analysis. **Results:** We described the interview findings that address women's employment experiences. The current analysis includes 27 women who are majority self-described as non-Hispanic Black (74%) and publically insured (70%). Participants were employed in a range of professions; food services, childcare and retail were the most common occupations. Participants described multiple ways that being pregnant impacted their earning potential, ranging from voluntary work-hour reduction, involuntary duty hour reductions by employers, truncated promotions, and termination of employment. Participants also shared varying experiences with workplace accommodations to their work environment and job duties based on their pregnancy. Some of these accommodations were initiated by a collaborative employee/employer discussion, others were initiated by the employer's perception of safe working conditions in pregnancy, and some accommodations were based on medical recommendations. Participants described supportive and unsupportive employer reactions to requests for accommodations. **Conclusions:** Our findings provide novel insights into women's experiences balancing a

pregnancy at increased risk for preterm birth with employment obligations. While many women reported positive experiences, the most striking insights came from women who described negative situations that ranged from challenging to potentially unlawful. Many of the findings suggest profound misunderstandings likely exist at the patient, employer and clinical provider level about the laws surrounding employment in pregnancy, safe employment responsibilities during pregnancy, and the range of creative accommodations that often allow for continued workplace productivity even during high risk pregnancy.

**Wheeler et al. 2020.**

**BMC Pregnancy and Childbirth, vol. 20, no. 1.**

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**Keywords:** Employment; high risk pregnancy; preterm birth; work.

**Evidence Level:** 5A

**Link:** <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-03246-7>

## Work Health and Safety

### **Relationship between chronic stress and heart rate over time modulated by gender in a cohort of office workers: Cross-sectional study using wearable technologies**

**Background:** Chronic stress is increasing in prevalence and is associated with several physical and mental disorders. Although it is proven that acute stress changes physiology, much less is known about the relationship between physiology and long-term stress. Continuous measurement of vital signs in daily life and chronic stress detection algorithms could serve this purpose. For this, it is paramount to model the effects of chronic stress on human physiology and include other cofounders, such as demographics, enabling the enrichment of a population-wide approach with individual variations. **Objective:** The main objectives of this study were to investigate the effect of chronic stress on heart rate (HR) over time while correcting for weekdays versus weekends and to test a possible modulation effect by gender and age in a healthy cohort. **Methods:** Throughout 2016 and 2017, healthy employees of technology companies were asked to participate in a 5-day observation stress study. They were required to wear two wearables, of which one included an electrocardiogram sensor. The derived HR was averaged per hour and served as an output for a mixed design model including a trigonometric fit over time with four harmonics (periods of 24, 12, 8, and 6 hours), gender, age, whether it was a workday or weekend day, and a chronic stress score derived from the Perceived Stress Scale (PSS) as predictors. **Results:** The study included 328 subjects, of which 142 were female and 186 were male participants, with a mean age of 38.9 (SD 10.2) years and a mean PSS score of 13.7 (SD 6.0). As main effects, gender ( $\chi^2_1=24.02$ ,  $P<.001$ ); the hour of the day ( $\chi^2_1=73.22$ ,  $P<.001$ ); the circadian harmonic ( $\chi^2_2=284.4$ ,  $P<.001$ ); and the harmonic over 12 hours ( $\chi^2_2=242.1$ ,  $P<.001$ ), over 8 hours ( $\chi^2_2=23.78$ ,  $P<.001$ ), and over 6 hours ( $\chi^2_2=82.96$ ,  $P<.001$ ) had a significant effect on HR. Two three-way interaction effects were found. The interaction of age, whether it was a workday or weekend day, and the circadian harmonic over time were significantly correlated with HR ( $\chi^2_2=7.13$ ,  $P=.03$ ), as well as the interaction of gender, PSS score, and the circadian harmonic over time ( $\chi^2_2=7.59$ ,  $P=.02$ ). **Conclusions:** The results show a relationship between HR and the three-way interaction of chronic stress, gender, and the circadian harmonic. The modulation by gender might be related to evolution-based energy utilization strategies, as suggested in related literature studies. More research, including daily cortisol assessment, longer recordings, and a wider population, should be performed to confirm this interpretation. This would enable the development of more complete and personalized models of chronic stress.

**Van kraaij et al. 2020.**

**Journal of Medicine Internet Research, vol. 22, no. 9.**

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**Keywords:** Age; chronic stress; circadian rhythm; gender; heart rate; wearable device.

**Evidence Level:** 4A

**Link:** <https://www.jmir.org/2020/9/e18253/>

### **Cold-related symptoms and performance degradation among Thai poultry industry workers with reference to vulnerable groups: A cross-sectional study**

**Background:** Few studies have examined cold-related symptoms among cold workplace workers in Thailand. This study aimed to determine the prevalence of cold-related cardiorespiratory, circulatory, and general symptoms and performance degradation among Thai chicken industry workers and identify vulnerable groups. **Methods:** Overall, 422 workers aged from 18 to 57 years at four chicken meat factories in Thailand were interviewed for cold-related symptoms and complaints. The results were expressed in terms of model-based adjusted prevalence and prevalence differences (PDs) in percentage points (pp) with 95% confidence intervals (CIs). **Results:** In total, 76.1% of the respondents reported cold-related respiratory symptoms, 24.6% reported cardiac symptoms, 68.6% reported circulatory symptoms, and 72.1% reported general symptoms. In addition, 82.7% of the respondents reported performance degradation. Cold-related respiratory symptoms increased by PD 29.0 pp. (95% CI 23.4-34.6) from the lowest to the highest educational group, with a similar pattern observed in performance degradation. Forklift drivers and storage and manufacturing workers complained of cold-related respiratory symptoms more than office staff (PD 22.1 pp., 95% CI 12.8-31.3; 12.0 pp., 95% CI 2.4-21.6; and 17.5 pp., 95% CI 11.5-23.6, respectively); they also reported more performance degradation (PD 24.1 pp., 95% CI 17.0-31.2; 19.8 pp., 95% CI 14.1-25.6; and 14.8 pp., 95% CI 8.0-22.6, respectively). Weekly alcohol consumers reported more performance problems owing to cold (PD 18.2 pp., 95% CI 13.9-22.6) than non-consumers of alcohol. Cardiac and circulation symptoms were more common in women than men (PD 10.0 pp., 95% CI 1.1-18.9; and 8.4 pp., 95% CI 0.5-16.4, respectively). The age trend in performance issues was curved, with the highest prevalence among those aged 35-44 years, while the oldest workers (45-57 years) perceived less cold-related symptoms, particularly thirst. **Conclusions:** Cold-related symptoms and performance degradation were found to be common in this industry, with vulnerable groups comprising of highly educated workers, forklift drivers, storage and manufacturing workers, weekly alcohol consumers, aging workers, and women. The results demonstrate a need for further research on the adequacy of protection provided against the cold, particularly given that global warming will increase the contrast between cold workplaces and outdoor heat.

**Auttanate et al. 2020.**

**BMJ Public Health, vol. 20, no. 1.**

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**Keywords:** Cold; occupation; poultry industry; symptoms.

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09272-6>

### **Business cycle and occupational accidents in Korea**

**Background:** Occupational accidents occur for a variety of reasons, such as unsafe behaviors of workers and insufficient safety equipment at the workplace, but there are also various economic and social factors that can impact working conditions and working environment. This study analyzed the relationship between changes in economic factors and the occurrence of occupational accidents in Korea. **Methods:** Multilinear regression analysis was used as the analysis model. The general to specific method was also used, which consecutively removes statistically insignificant variables from a general model that includes dependent variables and lagged variables of dependent variables. **Results:** The frequency of occupational accidents was found to have a statistically significant relationship to economic indicators. The monthly number of cases of occupational injury and disease and fatal occupational injuries were found to be closely related to manufacturing capacity utilization, differences in the production index in the services sector, and commencements of building construction. The increase in equipment investment indicators was found to reduce fatal occupational injuries. **Conclusion:** The results of this study may be used to develop occupational accident trends or leading indicators, which in turn can be used by organizations that manage and monitor occupational accidents toward taking administrative action designed to reduce occupational accidents. The results also imply that short-term and mid- to long-term economic and social changes that can impact workers, workplaces and working conditions, and workplace organizations must be taken into

account if more effective government policies are to be established and implemented toward further prevention of occupational accidents.

**Kim et al. 2020.**

**Safety and Health at Work, vol. 11, no. 3.**

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**Keywords:** Business cycle; occupational injuries and diseases; regression analysis.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120302766?via%3Dihub>

### **Nonfatal occupational injuries to younger workers - United States, 2012-2018**

Adolescents and young adults represent approximately 13% of the U.S. workforce (1). Compared with adult workers, young workers (aged 15-24 years) experience higher rates of job-related injury (2,3). To describe injuries among young workers and inform research and prevention activities, CDC's National Institute for Occupational Safety and Health (NIOSH) analyzed national data for 2012-2018 from the occupational supplement to the National Electronic Injury Surveillance System\* (NEISS-Work) and for 2018 from the Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII).† During the 7-year period, an estimated 3.2 million (95% confidence interval [CI] = 2.6-3.7) nonfatal, job-related injuries to young workers were treated in hospital emergency departments (EDs). From 2012 to 2018, annual rates of work-related injuries§ treated in the ED (ED-treated injuries) declined overall across all age groups but ranged from 1.2 to 2.3 times higher for workers aged 15-24 years compared with those for adults aged 25-44 years. Workers aged 18-19 years had the highest rate of ED-treated injuries. In 2018, among all age groups, workers in service occupations¶ had the highest percentage of injuries requiring at least 1 day away from work. Among workers aged 15-17 years, those in the leisure and hospitality industry had the highest percentage of work-related injuries requiring at least 1 day away from work. Occupational injuries can have long-term impacts on health (4). The disproportionate risk of injury among young workers highlights the need for sustained, targeted public health efforts to prepare this population with essential workplace safety and health competencies before they enter the workforce and to provide high-quality safety training and close supervision on the job. NIOSH and its partners developed a free curriculum to teach adolescents workplace safety and health competencies, which includes identification of workplace hazards and methods for addressing them, how to understand their rights and responsibilities as workers, and how to voice concerns about work safety issues (5).

**Guerin et al. 2020.**

**MMWR, vol. 69, no. 35.**

**Keywords:** Non-fatal; occupational injuries; young workers; work.

**Evidence Level:** 4A

**Link:** [https://www.cdc.gov/mmwr/volumes/69/wr/mm6935a3.htm?s\\_cid=mm6935a3\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6935a3.htm?s_cid=mm6935a3_w)

## **Risk Assessment**

### **Functional movement screen as a predictor of occupational injury among Denver firefighters**

**Background:** The Functional Movement Screen (FMS™) is a screening tool used to assess an individual's ability to perform fundamental movements that are necessary to do physically active tasks. The purpose of this study was to assess the ability of FMS to predict occupational injury among Denver Fire Department firefighters. **Method:** FMS tests were administered from 2012 to 2016. Claim status was defined as any claim occurrence vs. no claim and an overexertion vs. no claim/other claim within 1 year of the FMS. To assess associations between FMS score and claim status, FMS scores were dichotomized into  $\leq 14$  and  $> 14$ . Age-adjusted odds ratios were calculated using logistic regression. Sensitivities and specificities of FMS predicting claims at various FMS score cut points, ranging from 10 to 20 were tested. **Results:** Of 581 firefighters (mean  $\pm$  SD, age  $38 \pm 9.8$  y) who completed FMS between February 2015 and March 2018, 188 (32.4%) filed a WC claim in the study time frame. Seventy-two of those (38.3%) were categorized as overexertion claims. There was no association between FMS score and claim status [odds ratio (OR) = 1.27,

95% confidence interval (CI): 0.88 - 1.83] and overexertion claim vs. no claim/other claim (OR = 1.33, 95% CI: 0.81 - 2.21). There was no optimal cutoff for FMS in predicting a WC claim. **Conclusions:** Although the FMS has been predictive of injuries in other populations, among this sample of firefighters, it was not predictive of a future WC claim.

**Shore et al. 2020.**

**Safety Health & Work, vol. 11, no. 3.**

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**Keywords:** FMS; firefighters; occupational health; occupational injury; occupational safety.

**Evidence Level:** 4A

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120302729?via%3Dihub>

### **Work accidents and occupational risks identified in the mobile emergency service**

**Objective:** To analyze the occurrence of work accidents among Mobile Emergency Service workers and the association with the identified occupational risks. **Method:** A quantitative, exploratory, descriptive and cross-sectional study conducted with Mobile Emergency Service workers in Rio Grande do Sul, between January 2016 and November 2017, using an online instrument. **Results:** A total of 265 workers participated. There was a significant association between the occurrence of accidents at work and professional category ( $p = 0.041$ ); as well as the occurrence of work accidents and the mesoregion ( $p = 0.015$ ). In the significant associations between the occurrence of accidents at work and occupational risks, accidents with sharps, physical aggression, animal bites, verbal aggression, traffic accidents during commuting and falls were highlighted. In addition, a significant association between the occurrence of an accident at work and work leave ( $p = 0.000$ ) was found. **Conclusion:** The occurrences of work accidents during pre-hospital service activities are related to the professional category of workers, the work mesoregion, work leave and the exposure of workers to different occupational risks.

**Goulart et al. 2020.**

**Revista de Escola de Enfermagem da, vol. 54.**

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**Keywords:** Work accidents; occupational risk; mobile emergency service workers.

**Evidence Level:** 4A

**Link:** [https://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0080-62342020000100452&lng=en&nrm=iso&tlng=en](https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342020000100452&lng=en&nrm=iso&tlng=en)

## **Ergonomics**

### **The effects of ramp gradients and pushing-pulling techniques on lumbar spinal load in healthy workers**

**Background:** Many tasks in industrial and health care setting are involved with pushing and pulling tasks up or down on a ramp. An efficient method of moving cart which reduces the risk of low back pain should be concerned. This study aimed to investigate the effects of handling types (HTs) and slope on lumbar spinal load during moving a cart on a ramp. We conducted a  $2 \times 2 \times 4$  factorial design with three main factors: 2 HTs, 2 handling directions of moving a cart and 4 degrees of ramp slope. **Methods:** Thirty healthy male workers performed 14 tasks consist of moving a cart up and down on the ramp of  $0^\circ$ ,  $10^\circ$ ,  $15^\circ$ , and  $20^\circ$  degrees with pushing and pulling methods. Joint angles from a 3D motion capture system combined with subject height, body weight, and hand forces were used to calculate the spinal load by the 3DSSPP program. **Results:** Our results showed significant effect of HT, handling directions and slope on compression and shear force of the lumbar spine ( $p < 0.001$ ). When the ramp gradient increased, the L4/5 compression forces increased in both pushing and pulling ( $p < 0.001$ ) Shear forces increased in pulling and decreased in pushing in all tasks. At high slopes, pulling generated more compression and shear forces than that of pushing ( $p < 0.01$ ). **Conclusion:** Using the appropriate technique of moving a cart on the ramp can reduce the risk of high spinal load, and the pushing is therefore recommended for moving a cart up/down on ramp gradients.

**Pinupong et al. 2020.**

### **Safety and Health at Work, vol. 11, no. 3.**

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**Keywords:** Manual handling; pulling; pushing; slope of ramp floor; spinal load.

**Evidence Level:** 5A

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120302754?via%3Dihub>

## **Chronic Health Issues**

### **Influence of changing working conditions on exit from paid employment among workers with a chronic disease**

**Objectives:** To investigate the relation between changes in working conditions and exit from paid employment among workers with a chronic disease. **Methods:** Six waves from the longitudinal Study on Transitions in Employment, Ability and Motivation (2010-2016), enriched with tax-based employment information from Statistics Netherlands (2011-2017), were available for 4820 chronically ill workers aged 45-63 years (mean 55.3 years, SD 5.1). A change in working conditions (physical workload, psychological job demands, job autonomy, emotional job demands and social support) was defined as an increase or decrease between two consecutive waves of at least one SD. Discrete-time survival models with repeated measurements were used to estimate the relative risk (RR) of a change in working conditions on exiting paid employment in the following year compared with no change and consecutive favourable working conditions. **Results:** A favourable change in physical workload lowered the risk to exit paid employment (RR 0.46, 95% CI 0.22 to 0.94). An adverse change in psychosocial working conditions, especially a decrease in social support (RR 2.07, 95% CI 1.52 to 2.81), increased the likelihood to exit paid employment. In contrast, a favourable change in psychological job demands increased the risk to exit paid employment (RR 1.57, 95% CI 1.09 to 2.24). Multiple adverse changes increased the risk to exit paid employment up to six times (RR 6.06, 95% CI 2.83 to 12.98). **Conclusions:** Changes in working conditions among workers with chronic diseases influence exit from paid employment. Ensuring that working conditions can be adapted to the needs of workers with a chronic disease may help to extend working life.

**Schram et al. 2020.**

### **Occupational and Environmental Medicine, vol. 77, no. 9.**

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**Keywords:** Occupational health practice; physical work; workload.

**Evidence Level:** 4B

**Link:** <https://oem.bmj.com/content/77/9/628.long>

### **The impact of disease severity and duration on cost, early retirement and ability to work in rheumatoid arthritis in Europe: An economic modelling study**

**Objective:** RA is a progressive, chronic autoimmune disease. We summarize the impact of disease activity as measured by the DAS in 28 joints (DAS28-CRP scores) and pain on productivity and ability to work using the Work Productivity and Activity Impairment questionnaire (WPAI) scores, in addition to the impact of disease duration on the ability to work. **Methods:** Data were drawn from the Burden of RA across Europe: a Socioeconomic Survey (BRASS), a European cross-sectional study in RA. Analyses explored associations between DAS28-CRP score and disease duration with stopping work because of RA, and regression analyses assessed impacts of pain and DAS28-CRP on early retirement and WPAI. **Results:** Four hundred and seventy-six RA specialist clinicians provided information on 4079 adults with RA, of whom 2087 completed the patient survey. Severe disease activity was associated with higher rates of stopping work or early retirement attributable to RA (21%) vs moderate/mild disease (7%) or remission (8%). Work impairment was higher in severe (67%) or moderate RA (45%) compared with low disease activity [LDA (37%)] or remission (28%). Moreover, patients with severe (60%) or moderate pain (48%) experienced increased work impairment [mild (34%) or no pain (19%)]. Moderate to severe pain is significant in patients with LDA (35%) or remission (22%). A statistically significant association was found between severity, duration and



pain vs work impairment, and between disease duration vs early retirement. **Conclusion:** Results demonstrate the high burden of RA. Furthermore, subjective domains, such as pain, could be as important as objective measures of RA activity in affecting the ability to work.

**Galloway et al. 2020.**

**Rheumatology Advances in Practice, vol. 4, no. 2.**

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**Keywords:** Health economics; management; outcome measures; pain assessment; quality of life; rheumatoid arthritis.

**Evidence Level:** 4A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7494042/>

### **Impact of individual headache types on the work and work efficiency of headache sufferers**

**Background:** Headaches have not only medical but also great socioeconomic significance, therefore, it is necessary to evaluate the overall impact of headaches on a patient's life, including their work and work efficiency. The aim of this study was to determine the impact of individual headache types on work and work efficiency. **Methods:** This research was designed as a cross-sectional study performed by administering a questionnaire among employees. The questionnaire consisted of general questions, questions about headache features, and questions about the impact of headaches on work. **Results:** Monthly absence from work was mostly represented by migraine sufferers (7.1%), significantly more than with sufferers with tension-type headaches (2.23%;  $p = 0.019$ ) and other headache types (2.15%;  $p = 0.025$ ). Migraine sufferers (30.2%) worked in spite of a headache for more than 25 h, which was more frequent than with sufferers from tension-type and other-type headaches (13.4%). On average, headache sufferers reported work efficiency ranging from 66% to 90%. With regard to individual headache types, this range was significantly more frequent in subjects with tension-type headaches, whereas 91-100% efficiency was significantly more frequent in subjects with other headache types. Lower efficiency, i.e., 0-40% and 41-65%, was significantly more frequent with migraine sufferers. **Conclusions:** Headaches, especially migraines, significantly affect the work and work efficiency of headache sufferers by reducing their productivity. Loss is greater due to reduced efficiency than due to absenteeism.

**Simic et al. 2020.**

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

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**Keywords:** Headache burden; migraine; tension-type headache; working population.

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/1660-4601/17/18/6918>

## **Occupational Exposure**

### **Occupational exposures associated with life expectancy without and with disability**

Policies to extend working lives often do not take into account potentially important health inequalities arising from differences in occupational exposures. Little is known about which occupational exposures are associated with these inequalities. This study aims to examine differences in life expectancy without and with disability by occupational exposures. Longitudinal data (1992-2016) on disability and physical and psychosocial work demands and resources of 2513 (former) workers aged  $\geq 55$  years participating in the Longitudinal Aging Study Amsterdam were used. Gender specific life expectancies without and with disability by occupational exposures were calculated using multistate survival models. Women aged 55 years with high physical work demands had a lower life expectancy without disability than those with low exposure (1.02-1.57 years), whereas there was no difference for men. Men and women with high psychosocial work demands and resources had a longer life expectancy without disability than those with low exposure (1.19-2.14 years). Life expectancy with disability did not significantly differ across occupational exposures. Workers with higher psychosocial demands and resources and lower physical demands can expect to live more disability-free years. Information on occupational exposure helps to

identify workers at risk for lower life expectancy, especially without disability, who may need specific support regarding their work environment.

**de Wind et al. 2020.**

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

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**Keywords:** Ageing; disability; gender; healthy life expectancy; occupational exposure.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/17/6377>

### **Combined effects of occupational exposure to hazardous operations and lifestyle-related factors on cancer incidence**

We aimed to examine whether the number of types of hazardous operations at work experienced through a lifetime is associated with cancer incidence, and additionally examined the combined effects with lifestyle-related factors. Using a nationwide, multicenter, hospital inpatient dataset (2005-2015), we conducted a matched case-control study with 1,149,296 study subjects. We classified the participants into those with none, one, and two or more types of hazardous operation experience, based on information of special medical examinations taken, mandatory in Japan for workers engaged in hazardous operations. Using those with no experience as the reference group, we estimated the odds ratios for cancer incidence (all sites, lung, stomach, colon and rectum, liver, pancreas, bile duct, and bladder) by conditional logistic regression with multiple imputations. We also examined the effects of the combination with hazardous operations and lifestyle-related factors. We observed increased risks for cancer of all sites, and lung, pancreas, and bladder cancer associated with the experience of hazardous operations. Multivariable-adjusted ORs (95% CIs) of cancer incidence of all sites were 1 (reference), 1.16 (1.12, 1.21), and 1.17 (1.08, 1.27) for none, one, and two or more types of hazardous operation experience, respectively (P for trend <0.001). Potential combined associations of hazardous operations with smoking were observed for lung, pancreas, and bladder cancer, and with diabetes for pancreas cancer. Engaging in hazardous operations at work and in combination with lifestyle-related factors may increase the risk of cancer. We highlight the potential for those engaged in hazardous work to avoid preventable cancers.

**Fukai et al. 2020.**

**Cancer Science, vol. 25.**

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**Keywords:** Cancer incidence; case-control study; diabetes; occupational exposure; smoking.

**Evidence Level:** 5A

**Link:** <https://onlinelibrary.wiley.com/doi/10.1111/cas.14663>

### **Occupational noise-induced hearing loss in China: A systematic review and meta-analysis**

**Objective:** Most of the Chinese occupational population are becoming at risk of noise-induced hearing loss (NIHL). However, there is a limited number of literature reviews on occupational NIHL in China. This study aimed to analyse the prevalence and characteristics of occupational NIHL in the Chinese population using data from relevant studies. **Design:** Systematic review and meta-analysis. **Methods:** From December 2019 to February 2020, we searched the literature through databases, including Web of Science, PubMed, MEDLINE, Scopus, the China National Knowledge Internet, Chinese Sci-Tech Journal Database (weip.com), WanFang Database and China United Library Database, for studies on NIHL in China published in 1993-2019 and analysed the correlation between NIHL and occupational exposure to noise, including exposure to complex noise and coexposure to noise and chemicals. **Results:** A total of 71 865 workers aged  $33.5 \pm 8.7$  years were occupationally exposed to  $98.6 \pm 7.2$  dB(A) (A-weighted decibels) noise for a duration of  $9.9 \pm 8.4$  years in the transportation, mining and typical manufacturing industries. The prevalence of occupational NIHL in China was 21.3%, of which 30.2% was related to high-frequency NIHL (HFNIHL), 9.0% to speech-frequency NIHL and 5.8% to noise-induced deafness. Among manufacturing workers, complex noise contributed to greater HFNIHL than Gaussian noise (overall weighted OR (OR)=1.95). Coexposure to noise and chemicals such as organic solvents, welding fumes, carbon monoxide and hydrogen sulfide led to greater HFNIHL than noise exposure alone (overall weighted OR=2.36). Male workers were more likely to experience HFNIHL than female workers (overall weighted OR=2.26). Age, noise level and exposure

duration were also risk factors for HFNIHL (overall weighted OR=1.35, 5.63 and 1.75, respectively).

**Conclusions:** The high prevalence of occupational NIHL in China was related to the wide distribution of noise in different industries as well as high-level and long-term noise exposure. The prevalence was further aggravated by exposure to complex noise or coexposure to noise and specific chemicals. Additional efforts are needed to reduce occupational noise exposure in China.

**Zhou et al. 2020.**

**BMJ Open, vol. 10, no. 9.**

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

**Evidence Level:** 1A

**Link:** <https://bmjopen.bmj.com/content/10/9/e039576.long>

### **Association between chronic obstructive pulmonary disease (COPD) and occupational exposures: A hospital based quantitative cross-sectional study among the Bangladeshi population**

The association between chronic obstructive pulmonary disease (COPD) and occupational exposures are less studied in Bangladeshi context, despite the fact that occupational exposures are serious public health concerns in Bangladesh. Therefore, this study aimed to evaluate this association considering demographic, health and smoking characteristics of Bangladeshi population. This was a hospital-based quantitative study including 373 participants who were assessed for COPD through spirometry testing. Assessment of occupational exposures was based on both self-reporting by respondents and ALOHA based job exposure matrix (JEM). Here, among the self-reported exposed group (n = 189), 104 participants (55%) were found with COPD compared to 23 participants (12.5%) in unexposed group (n = 184) that differed significantly (p = 0.00). Similarly, among the JEM measured low (n = 103) and high exposed group (n = 236), 23.3% and 41.5% of the participants were found with COPD respectively; compared to unexposed group (14.7%; n = 34), that differed significantly also (p = 0.00). Likewise, participants with longer self-reported occupational exposures (>8 years) showed significantly (p = 0.00) higher proportions of COPD (79.5%) compared to 40.4% in shorter exposure group (1-8 years). Similarly, significant (p = 0.00) higher cases of COPD were observed among the longer cumulative exposure years (>9 years) group than the shorter cumulative exposure years (1-9 years) group in JEM. While combining smoking and occupational exposure, the chance of developing COPD among the current, former and non-smokers of exposed group were 7.4, 7.2 and 12.7 times higher respectively than unexposed group. Furthermore, logistic analysis revealed that after adjustments for confounding risk factors, the chance of developing COPD among the self-reported exposure group was 6.3 times higher (ORs: 6.3, p = 0.00) than unexposed group; and JEM exposure group has odds of 2.8 and 1.1 respectively (p<0.05) for high and low exposures. Further studies are needed to reinforce this association between COPD and occupational exposure in Bangladesh.

**Sumit et al. 2020.**

**PLoS One, vol. 15, no. 9.**

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**Keywords:** Chronic obstructive pulmonary disease; COPD; occupational exposure; hospital.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239602>

### **Examining relationship between occupational acid exposure and oral health in workplace**

**Background:** Acid mist can suspend in the air and enter the body via skin contact, the respiratory tract, or even oral intake, which pose various health hazards. Previous studies have shown that occupational exposure to acid mist or acidic solutions is a major risk factor for oral diseases. However, the findings are inconsistent and do not consider individual factors and lifestyles that may cause the same oral diseases. Therefore, we conducted a comprehensive oral health survey and collected detail information to confirm the effect of acidic solution exposure on worker's oral health. **Methods:** From 4 acidic solution factories, a total of 309 subjects (157 in control and 152 in exposed group) was enrolled. All participants completed oral examinations and self-report questionnaire, including the decayed, missing, and filled teeth (DMFT) index, community periodontal index (CPI), loss of attachment (LA) index, and tooth erosion. Multivariate logistic regression analysis was used to determine the association between the acidic solution exposure and oral

health. **Results:** The results showed that acid exposure was correlated with soft oral tissue injury rather than hard oral tissue in our survey. In the multivariate model (adjusted for sex, age, worked years, education level, mouthwash use, dental floss use, tooth brushing, mask use, smoking, drinking, chewing areca and dietary habits with acidic foods), significant relationships of acid exposure with LA score were observed (OR = 2.32, 95% CI 1.03-5.26). However, the presence of acid exposure was not significantly associated with tooth erosion, DMFT, and CPITN. **Conclusion:** Our study highlighted that occupational acid exposure was an independent risk factor for periodontal health, especially LA. It is important to strengthen occupational hazard control, educate workers on oral disease and related factors, and raise the awareness of oral hygiene.

**Chen et al. 2020.**

**BMJ Public Health, vol. 20, no. 1.**

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**Keywords:** Acid mist; CPITN; loss of attachment; tooth erosion.

**Evidence Level:** 4A

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09496-6>

### **Factors associated with self-reported exposure to chemical substances at work in Brazil: Results from the National Health Survey, 2013**

**Objective:** To describe the prevalence of self-reported exposure to chemical substances at work and its associated factors in a sample of Brazilian adults that participated in the National Health Survey, conducted between 2013 and 2014. **Methods:** Our sample consisted of adults aged 18 years or older that answered question E1 of module E: "In the week of July 21-27, 2013 (reference week), did you work as regular employee or intern for at least an hour in any activity paid with cash?" Sociodemographic data, situation and health behaviors were analyzed with single and multivariate binary logistic regression. The model was adjusted by the variables of all groups, adopting a 5% significance level. The values of odds ratio (OR) and respective confidence intervals were obtained. **Results:** Women (OR = 0.74; 95%CI 0.66-0.82) had a lower chance of exposure to chemicals. The highest chances were observed in groups with no instruction or that attended up to middle-school (OR = 1.77; 95%CI 1.50-2.08), high school (OR = 1.62; 95%CI 1.37-1.91), age between 25 and 54 years (OR = 1.26; 95%CI 1.07-1.48), current smokers (OR = 1.21; 95%CI 1.07-1.37), who reported tiredness (OR = 1.35; 95%CI 1.21-1.50), hearing difficulties (OR = 1.24; 95%CI 1.04-1.48) and who reported having suffered an accident at work (OR = 2.00; 95%CI 1.57-2.54). **Conclusions:** The unprecedented results cover the entire workforce. Positive associations with hearing loss, smoking and history of work accidents are consistent, as well as the inverse association with education level and gender differences. The absence of association with asthma was surprising. To fill gaps in investigations on chronic non-communicable diseases, we suggested improving the PNS collection instrument in the occupational dimension.

**Assuncao et al. 2020.**

**Revista de Saude Publica, vol. 54, no. 92.**

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**Keywords:** Chemical substances; occupational exposure; Brazil; self-reported exposure; workforce.

**Evidence Level:** 4B

**Link:** [https://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0034-89102020000100267&lng=en&nrm=iso&tlng=en](https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102020000100267&lng=en&nrm=iso&tlng=en)

### **Sustainable solutions to mitigate occupational heat strain – an umbrella review of physiological effects and global health perspectives**

**Background:** Climate change is set to exacerbate occupational heat strain, the combined effect of environmental and internal heat stress on the body, threatening human health and wellbeing. Therefore, identifying effective, affordable, feasible and sustainable solutions to mitigate the negative effects on worker health and productivity, is an increasingly urgent need. **Objectives:** To systematically identify and evaluate methods that mitigate occupational heat strain in order to provide scientific-based guidance for practitioners. **Methods:** An umbrella review was conducted in biomedical databases employing the following eligibility criteria: 1) ambient temperatures > 28 °C or hypohydrated participants, 2) healthy

adults, 3) reported psychophysiological (thermal comfort, heart rate or core temperature) and/or performance (physical or cognitive) outcomes, 4) written in English, and 5) published before November 6, 2019. A second search for original research articles was performed to identify interventions of relevance but lacking systematic reviews. All identified interventions were independently evaluated by all co-authors on four point scales for effectiveness, cost, feasibility and environmental impact. **Results:** Following screening, 36 systematic reviews fulfilled the inclusion criteria. The most effective solutions at mitigating occupational heat strain were wearing specialized cooling garments, (physiological) heat acclimation, improving aerobic fitness, cold water immersion, and applying ventilation. Although air-conditioning and cooling garments in ideal settings provide best scores for effectiveness, the limited applicability in certain industrial settings, high economic cost and high environmental impact are drawbacks for these solutions. However, (physiological) acclimatization, planned breaks, shading and optimized clothing properties are attractive alternative solutions when economic and ecological sustainability aspects are included in the overall evaluation. **Discussion:** Choosing the most effective solution or combinations of methods to mitigate occupational heat strain will be scenario-specific. However, this paper provides a framework for integrating effectiveness, cost, feasibility (indoors and outdoor) and ecologic sustainability to provide occupational health and safety professionals with evidence-based guidelines.

**Morris et al. 2020.**

**Environmental Health, vol. 19, no. 1.**

**User License:**

**Keywords:** Climate change; environmental health; heat stress; occupational hygiene; occupational medicine.

**Evidence Level:** 1A

**Link:** <https://ehjournal.biomedcentral.com/articles/10.1186/s12940-020-00641-7>

### **Two-year responses of office and ambulatory blood pressure to first occupational lead exposure**

Lead exposure causing hypertension is the mechanism commonly assumed to set off premature death and cardiovascular complications. However, at current exposure levels in the developed world, the link between hypertension and lead remains unproven. In the Study for Promotion of Health in Recycling Lead (URL: <https://www.clinicaltrials.gov>; Unique identifier: NCT02243904), we recorded the 2-year responses of office blood pressure (average of 5 consecutive readings) and 24-hour ambulatory blood pressure to first occupational lead exposure in workers newly employed at lead recycling plants. Blood lead (BL) was measured by inductively coupled plasma mass spectrometry (detection limit 0.5 µg/dL). Hypertension was defined according to the 2017 American College of Cardiology/American Heart Association guideline. Statistical methods included multivariable-adjusted mixed models with participants modeled as a random effect and interval-censored Cox regression. Office blood pressure was measured in 267 participants (11.6% women, mean age at enrollment, 28.6 years) and ambulatory blood pressure in 137 at 2 follow-up visits. Geometric means were 4.09 µg/dL for baseline BL and 3.30 for the last-follow-up-to-baseline BL ratio. Fully adjusted changes in systolic/diastolic blood pressure associated with a doubling of the BL ratio were 0.36/0.28 mm Hg (95% CI, -0.55 to 1.27/-0.48 to 1.04 mm Hg) for office blood pressure and -0.18/0.11 mm Hg (-2.09 to 1.74/-1.05 to 1.27 mm Hg) for 24-hour ambulatory blood pressure. The adjusted hazard ratios of moving up across hypertension categories for a doubling in BL were 1.13 (0.93-1.38) and 0.84 (0.57-1.22) for office blood pressure and ambulatory blood pressure, respectively. In conclusion, the 2-year blood pressure responses and incident hypertension were not associated with the BL increase on first occupational exposure.

**Yu et al. 2020.**

**Hypertension, vol. 76, no. 4.**

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**Keywords:** Ambulatory blood pressure monitoring; environmental exposure; hypertension; lead; occupational exposure.

**Evidence Level:** 5A

Link: <https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.120.15590>

### **Changes in spirometry indices and lung cancer mortality risk estimation in concrete workers exposed to Crystalline Silica**

The health of workers in the concrete and cement industries can be at risk due to occupational exposure to silica dust. The purpose of this study was to evaluate the changes of pulmonary parameters and risk of mortality from lung cancer in concrete workers exposed to crystalline silica. This cross-sectional study was performed on 72 male workers exposed to silica at a concrete manufacturing plant in Neyshabur, Iran. Respiratory zone air sampling was performed using the standard NIOSH7602 method using individual sampling pumps and membrane filters. Then, the amount of silica in the samples was determined using the Fourier Transform Infrared technique. The risk of death from lung cancer was determined using Rice et al.'s model. Respiratory indices were measured using a spirometer. Data were analyzed by the SPSS 20 software. Occupational exposure to silica was 0.025 mg/m<sup>3</sup> and mortality was estimated to be 7-94 per thousand. All spirometry indices significantly decreased during these 4 years of exposure to silica dust. The respiratory pattern of 22% of the exposed workers was obstructive and this prevalence was significantly higher than the control group. The results showed that although the average occupational exposure to silica in these concrete workers was below the recommended threshold of national and international organizations, their risk of death was significantly higher; and workers' lung indices had significantly decreased over four years. Therefore, appropriate measures should be taken to reduce silica exposure among these workers.

**Moghamdam et al. 2020.**

**Asian Pacific Journal of Cancer Prevention, vol. 21, no. 9.**

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**Keywords:** Concrete; lung cancer; pulmonary function; risk; silica dust.

**Evidence Level:** 4B

**Link:** [http://journal.waocp.org/article\\_89288.html](http://journal.waocp.org/article_89288.html)

### **The association between occupational exposure to hand-arm vibration and hearing loss: A systematic literature review**

**Background:** Hearing loss is one of the most prevalent worker health conditions worldwide. Although the effect of noise exposure on hearing is well researched, other workplace exposures may account for significant hearing loss. The aim of this review was to determine whether occupational hand-arm vibration exposure through use of power or pneumatic tools, independent of noise exposure, is associated with permanent hearing loss. Do workers suffer from hand-arm vibration-induced hearing loss?

**Methods:** Peer-reviewed articles published in English between 1981 and 2020 were identified through five online databases with five search keywords. Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines, including online database search methodology, study selection, article exclusion, and assessment of potential study design confounders and biases, were followed.

**Results:** Database searches retrieved 697 articles. Fifteen articles that reported 17 studies met the criteria for review. All but two studies revealed statistically significant associations between occupational exposure to hand-arm vibration and hearing loss. The majority of the study results revealed associations between hand-arm vibration and hearing loss, independent of potential age and noise confounders.

**Conclusion:** Few studies have examined the association between occupational exposure to hand-arm vibration and hearing loss. Dose response data were limited as only one study measured vibration intensity and duration. Although the majority of studies identified statistically significant associations, causal relationships could not be determined. Further research using standardized and uniform measurement protocols is needed to confirm whether the association between occupational exposure to hand-arm vibration and permanent hearing loss is causal and the mechanism(s).

**Weier et al. 2020.**

**Safety and Health at Work, vol. 11, no. 3.**

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**Keywords:** Hand-arm vibration; hearing loss; raynaud; vibration; white finger.

**Evidence Level:** 1A

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120302699?via%3Dihub>

### **Occupational exposure to carbon black nanoparticles increases inflammatory vascular disease risk: An implication of an ex vivo biosensor assay**

**Background:** Among manufactured or engineered nanoparticles, carbon black (CB) has largest production worldwide and is also an occupational respiratory hazard commonly seen in rubber industry. Few studies have assessed the risk for cardiovascular disease in carbon black exposed populations. An endothelial biosensor assay was used to quantify the capacity of sera from 82 carbon black packers (CBP) and 106 non-CBPs to induce endothelial cell activation ex vivo. The mediation effect of circulatory proinflammatory factors on the association between carbon black exposure and endothelial cell activation was assessed and further validated using in vitro intervention experiments. **Results:** The average elemental carbon level inside carbon black bagging facilities was 657.0  $\mu\text{g}/\text{m}^3$ , which was 164-fold higher than that seen in reference areas (4.0  $\mu\text{g}/\text{m}^3$ ). A global index was extracted from mRNA expression of seven candidate biosensor genes using principal component analysis and used to quantify the magnitude of endothelial cell activation. This global index was found to be significantly altered in CBPs compared to non-CBPs ( $P < 0.0001$ ), however this difference did not vary by smoking status ( $P = 0.74$ ). Individual gene analyses identified that de novo expression of key adhesion molecules (e.g., ICAM and VCAM) and chemotactic factors (e.g., CCL2, CCL5, and CXCL8) responsible for the recruitment of leukocytes was dramatically induced in CBPs with CXCL8 showing the highest fold of induction (relative quantification = 9.1,  $P < 0.0001$ ). The combination of mediation analyses and in vitro functional validation confirmed TNF- $\alpha$ , IL-1 $\beta$ , and IL-6 as important circulatory factors mediating the effects of carbon black exposure on endothelial cell activation responses. **Conclusions:** Inflammatory mediators in sera from CBPs may bridge carbon black exposure and endothelial cell activation response assessed ex vivo. CBPs may have elevated risk for cardiovascular diseases when comorbidity exists. Our study may serve as a benchmark for understanding health effects of engineered carbon based nanoparticles with environmental and occupational health relevance.

**Tang et al. 2020.**

**Particle and Fibre Toxicology, vol. 17, no. 1.**

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**Keywords:** Biosensor; carbon black nanoparticles; endothelial cell activation; mediation effect.

**Evidence Level:** 6B

**Link:** <https://particleandfibretoxicology.biomedcentral.com/articles/10.1186/s12989-020-00378-8>

### **Occupational exposures and cardiac structure and function: ECHO-SOL (Echocardiographic Study of Latinos)**

**Background:** Our objective was to determine associations of occupational exposures with cardiac structure and function in Hispanic/Latino adults. **Methods and Results:** Employed participants were included ( $n=782$ ; 52% women, mean age 52.9 years). Occupational exposures to burning wood, vehicle exhaust, solvents, pesticides, and metals at the current and longest-held job were assessed by questionnaire. Survey multivariable linear regression analyses were used to model the relationship of each self-reported exposure with echocardiographic measures of cardiac structure and function. Exposure to burning wood at the current job was associated with decreased left ventricular (LV) ejection fraction (-3.1%; standard error [SE], 1.0 [ $P=0.002$ ]). When the analysis was restricted to exposure at the longest-held job, occupational exposure to burning wood was associated with increased LV diastolic volume (6.7 mL; SE, 1.6 [ $P<0.0001$ ]), decreased LV ejection fraction (-2.7%; SE, 0.6 [ $P<0.0001$ ]), worse LV global longitudinal strain (1.0%; SE, 0.3 [ $P=0.0009$ ]), and decreased right ventricular fractional area change (-0.02; SE, 0.004 [ $P<0.001$ ]). Exposure to pesticides was associated with worse average global longitudinal strain (0.8%; SE, 0.2 [ $P<0.0001$ ]). Exposure to metals was associated with worse global longitudinal strain in the 2-chamber view (1.0%; SE, 0.5 [ $P=0.04$ ]), increased stroke volume (3.6 mL; SE, 1.6 [ $P=0.03$ ]), and increased LV mass indexed to BSA (9.2  $\text{g}/\text{m}^2$ ; SE, 3.8 [ $P=0.01$ ]) or height (4.4  $\text{g}/\text{m}^{2.7}$ ; SE, 1.9 [ $P=0.02$ ]). **Conclusions:** Occupational exposures to burning wood, vehicle exhaust, pesticides, and metals were associated with abnormal parameters of LV

and right ventricular systolic function. Reducing exposures to toxic chemicals and particulates in the workplace is a potential opportunity to prevent cardiovascular disease in populations at risk.

**Peña et al. 2020.**

**Journal of the American Heart Association vol. 9, no. 17.**

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**Keywords:** Air pollution; echocardiography; environmental medicine; occupational medicine.

**Evidence Level:** 5B

**Link:** <https://www.ahajournals.org/doi/10.1161/JAHA.120.016122>

## Asbestosis and Mesothelioma

### **Estimate of environmental and occupational components in the spatial distribution of malignant mesothelioma incidence in Lombardy (Italy)**

**Introduction:** Measuring and mapping the occurrence of malignant mesothelioma (MM) is a useful means to monitor the impact of past asbestos exposure and possibly identify previously unknown sources of asbestos exposure. **Objective:** Our goal is to decompose the observed spatial pattern of incidence of MM in the Lombardy region (Italy) in gender-specific components linked to occupational exposure and a shared component linked to environmental exposure. **Materials and methods:** We selected from the Lombardy Region Mesothelioma Registry (RML) all incident cases of MM (pleura, peritoneum, pericardium, and tunica vaginalis testis) with first diagnosis in the period 2000-2016. We mapped at municipality level crude incidence rates and smoothed rates using the Besag York and Mollié model separately for men and women. We then decomposed the spatial pattern of MM in gender-specific occupational components and a shared environmental component using a multivariate hierarchical Bayesian model. **Results:** We globally analyzed 6226 MM cases, 4048 (2897 classified as occupational asbestos exposure at interview) in men and 2178 (780 classified as occupational asbestos exposure at interview) in women. The geographical analysis showed a strong spatial pattern in the distribution of incidence rates in both genders. The multivariate hierarchical Bayesian model decomposed the spatial pattern in occupational and environmental components and consistently identified some known occupational and environmental hot spots. Other areas at high risk for MM occurrence were highlighted, contributing to better characterize environmental exposures from industrial sources and suggesting a role of natural sources in the Alpine region. **Conclusion:** The spatial pattern highlights areas at higher risk which are characterized by the presence of industrial sources - asbestos-cement, metallurgic, engineering, textile industries - and of natural sources in the Alpine region. The multivariate hierarchical Bayesian model was able to disentangle the geographical distribution of MM cases in two components interpreted as occupational and environmental.

**Catelan et al. 2020.**

**Environmental Research vol. 188.**

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**Keywords:** Asbestos exposure; epidemiological surveillance; hierarchical bayesian models; malignant mesothelioma.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0013935120305843?via%3Dihub>

## Sedentary Practices

### **The effectiveness of sedentary behaviour interventions on sitting time and screen time in children and adults: An umbrella review of systematic reviews**

**Background:** There is increasing concern about the time people spend in sedentary behaviour, including screen time, leisure and occupational sitting. The number of both primary research studies (published trials) and reviews has been growing rapidly in this research area. A summary of the highest level of evidence that provides a broader quantitative synthesis of diverse types of interventions is needed. This



research is to articulate the evidence of efficacy of sedentary behaviour interventions to inform interventions to reduce sitting time. The umbrella review, therefore, synthesised systematic reviews that conducted meta-analyses of interventions aiming at reducing sedentary behaviour outcomes across all age group and settings. **Method:** A systematic search was conducted on six databases (MEDLINE Complete, PsycINFO, CINAHL, Global Health via EBSCOhost platform, EMBASE, and Cochrane Central Register of Systematic Reviews). Included articles were systematic reviews with meta-analysis of interventions aiming at reducing sedentary behaviour (screen time, sitting time or sedentary time) in the general population across all age group. **Results:** Seventeen reviews met the inclusion criteria (7 in children and adolescent, 10 in adults). All reviews of sedentary behaviour interventions in children and adolescents investigated intervention effectiveness in reducing screen time. Six out of 11 meta-analyses (reported in 7 reviews) showed small but significant changes in viewing time. All reviews of sedentary behaviour interventions in office workplaces indicated substantial reduction in occupational sitting time (range: 39.6 to 100 min per 8-h workday). Sub-group analyses reported a trend favouring environmental change components such as sit-stand desks, active permissive workstations etc. Meta-analyses indicated that sedentary behaviour interventions were superior to physical activity alone interventions or combined physical activity and sedentary behaviour interventions in reducing sitting time. **Conclusion:** The current systematic reviews and meta-analyses supported sedentary behaviour interventions for reducing occupational sitting time in particular, with small changes seen in screen time in children and adolescents. Future research should explore approaches to maintaining behaviour change beyond the intervention period and investigate the potential of sedentary behaviour reduction interventions in older age groups in non-occupational settings.

**Nguyen et al. 2020.**

**International Journal of Behavioral Nutrition and Physical Activity, vol. 17, no. 1.**

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**Keywords:** Effectiveness; screen time; sedentary behaviour; sedentary time; sitting time; systematic review.

**Evidence Level:** 1A

**Link:** <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-020-01009-3>

## Physical Activity

### **Evaluation of an occupational exercise training program for Firefighters: Mixed methods pilot study**

**Background:** Occupational exercise training programs can improve overall health and fitness in firefighters, but evidence beyond clinical and performance outcomes is needed before fire departments invest in and successfully adopt health promotion programs. **Objective:** This mixed methods pilot study sought to pair clinical and performance outcomes with participants' qualitative feedback (e.g., participants' enjoyment, lifestyle behavior changes, and team structure) with the goal of informing recommendations for future programs. **Methods:** Professional firefighters participated in a 14-week occupational exercise training program with assessments conducted pre- and posttraining. Clinical outcomes included weight, BMI, body fat percentage, resting heart rate, systolic blood pressure, and diastolic blood pressure. Performance outcomes included the sharpened Romberg balance test, 1-repetition maximum leg press and bench press, graded exercise test (estimated  $VO_{2max}$ ), knee range of motion, shoulder flexibility, and hamstring flexibility. Self-administered surveys (Short Form-36, International Physical Activity Questionnaire, Barriers Self-Efficacy Scale, and Barriers to Being Active Quiz) were completed. In 3 private focus groups of 3 to 4 participants, firefighters' experiences in the training program and their health behaviors were explored. **Results:** Male firefighters ( $n=14$ ; age: mean 36.4, SD 2.6 years) completed 20 training sessions. There were no significant changes to weight ( $P=.20$ ), BMI ( $P=.15$ ), body fat percentage ( $P=.16$ ), systolic blood pressure ( $P=.12$ ), estimated  $VO_{2max}$  ( $P=.34$ ), balance ( $P=.24$ ), knee range of motion (left:  $P=.35$ ; right:  $P=.31$ ), or hamstring flexibility ( $P=.14$ ). There was a significant decrease in diastolic blood pressure ( $P=.04$ ) and significant increases in shoulder flexibility ( $P<.001$ ) and leg press 1-repetition maximum volume ( $P=.04$ ). Participants reported improvements in overall health, endurance, flexibility, and mood as well as

improvements to team environment and health behaviors around the station; however, there was a decline in overcoming barriers to physical activity. **Conclusions:** A 14-week program of exercise training in firefighters elicited improvements in clinical, performance, and self-reported physical activity outcomes. This occupational exercise training program for firefighters increased time spent exercising, improved team building, and led to physical and mental health benefits. Results from this pilot study set a broad, informed, and meaningful foundation for future efforts to increase firefighter participation in occupational fitness programs.

**Keywords:**

**Leary et al. 2020.**

**JMIR Formative Research, vol. 4, no. 9.**

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**Keywords:** Clinical; exercise; firefighters; mixed methods; performance; qualitative.

**Evidence Level:** 5A

**Link:** <https://formative.jmir.org/2020/9/e17835/>

### **The effectiveness of multi-component interventions targeting physical activity or sedentary behaviour amongst office workers: A three-arm cluster randomised controlled trial**

**Background:** Interventions to increase physical activity or reduce sedentary behaviour within the workplace setting have shown mixed effects. This cluster randomised controlled trial assessed whether multi-component interventions, focusing on changes at the individual, environmental, and organisational levels, either increased physical activity or reduced sedentary behaviour, compared to a passive control group.

**Methods:** Teams of office-workers from two companies participated in one of two interventions (iPA: targeting physical activity; or iSED: targeting sedentary behaviour), or wait-list control group (C). Exclusion criterion was very high physical activity level (MVPA  $\geq 30$  min/day in  $\geq 10$  min bouts every day).

Randomisation occurred at the level of workplace cluster, and groups were randomly allocated (1:1) with stratification for company and cluster size. Personnel involved in data collection and processing were blinded to group allocation. Both interventions included five sessions of cognitive behavioural therapy counselling for 6 months. iPA included counselling focused on physical activity, access to a gym, and encouragement to exercise, and go for lunch walks. iSED included counselling on sedentary behaviour and encouragement to reduce sitting and increase engagement in standing- and walking-meetings. At baseline and the 6-month mark accelerometers were worn on the hip and thigh for 7 days. The primary outcomes were group differences in time spent in moderate-to-vigorous intensity physical activity (%MVPA) and in sedentary behaviour (%), analysed using Bayesian multilevel modelling for those with complete data.

**Results:** Two-hundred and sixty three office workers (73% women, mean age  $42 \pm 9$  years, education  $15 \pm 2$  years) were randomised into 23 cluster teams (iPA  $n = 84$ , 8 clusters; iSED  $n = 87$ , 7 clusters; C  $n = 92$ , 7 clusters). No significant group differences (posterior mean ratios: 95% credible interval) were found after the intervention for %MVPA or for %Sedentary. %MVPA: iPA vs C (0.04: - 0.80-0.82); iSED vs C (0.47: - 0.41-1.32); iPA vs iSED (0.43: - 0.42-1.27). %Sedentary: iPA vs C (1.16: - 1.66-4.02); iSED vs C (- 0.44: - 3.50-2.64); iPA vs iSED (- 1.60: - 4.72-1.47). **Conclusions:** The multi-component interventions focusing on either physical activity or sedentary behaviour were unsuccessful at increasing device-measured physical activity or reducing sedentary behaviour compared to a control group.

**Nooijen et al. 2020.**

**BMC Public Health, vol. 20, no. 1.**

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**Keywords:** Device-based; intervention; office workers; physical activity; sedentary behaviour; self-report; workplace.

**Evidence Level:** 2A

**Link:** <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-020-09433-7>

### **Get vigorous with physical exercise and improve your well-being at work!**

The aim of this study is to investigate whether people who exercise regularly have higher levels of psychological well-being at work. Doing physical exercise is a habit that not only has consequences for physical and mental health, but it can also have positive consequences for organizations because physical

exercise makes it easier for the employee to recover from physical, mental, and emotional effort during the workday, thus showing higher levels of engagement the next day. Through the analysis of structural equation models in a sample of 485 workers from different Spanish and Latin American companies, this study shows that subjects who exercise more have higher levels of vigor in physical exercise, which is positively related to high levels of well-being at work. This means that organizations that promote activities related to physical exercise among their employees are building a process of resource recovery, which, through the vigor of these activities, makes workers feel less stressed and more satisfied, thus experiencing greater well-being at work. Therefore, at a practical level, these results suggest that the practice of physical exercise is a tool for organizations that want to promote their employees' psychological well-being.

**Gil-Beltrán et al. 2020.**

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

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**Keywords:** Healthy organizations; job satisfaction; physical exercise; positive affect; stress; vigor; well-being.

**Evidence Level:** 5B

**Link:** <https://www.mdpi.com/1660-4601/17/17/6384>

## Musculoskeletal Health

### **Prevalence and associated factors of musculoskeletal disorders among cleaners working at Mekelle University, Ethiopia**

**Background:** Musculoskeletal disorder is a common cause of morbidity, disability, and poor quality-of-life. Its burden among cleaners in developed countries ranges from 56-90%. However, there are a lack of studies in developing countries, particularly in the study area. Thus, the result of this study will help to resolve health problems caused by musculoskeletal disorders among cleaners. **Purpose:** The objective of this study was to identify the prevalence and associated factors of musculoskeletal disorders among cleaners working at Mekelle University. **Materials and methods:** An institutional-based cross-sectional study was conducted on 270 cleaners. Simple random sampling was used to select the study participants. Data were collected through interview using the standard Nordic Musculoskeletal Questionnaire. Descriptive statistics and bivariate logistic regression were done to identify factors associated with musculoskeletal disorder. In bivariate logistic regression analysis, variables with a P-value<0.25 were modeled to multivariate analysis. Variables with a P-value≤0.05 with 95% confidence interval (CI) in multivariate model were taken as statistically significant. Finally, AOR with 95% CI at a P-value<0.05 was reported. **Results:** This study found that the prevalence of musculoskeletal disorders among cleaners was 52.3% in the past 12 months and 31.8% in the last 7 days. Time pressure (AOR=3.25, 95% CI=1.08-9.77), work experience (AOR=2.49, 95% CI=1.12-5.52), feeling exhausted (AOR=2.68, 95% CI=1.16-6.20), working hours per day (AOR=3.55, 95% CI=1.54-8.20), awkward posture (AOR=15.71, 95% CI=6.47-38.17), and those who work more than 2 hours in sustaining position (AOR=8.05, 95% CI=2.25-28.85) showed a statistically significant association with musculoskeletal disorder. **Conclusion:** Musculoskeletal disorders were commonly reported among cleaners working at Mekelle University. Time pressure, work experience, feeling exhausted, working hours per day, awkward posture, and working >2 hours in sustaining position were statistically significant in their association with musculoskeletal disorders.

**Melese et al. 2020.**

**Journal of Pain Research, vol. 13.**

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**Keywords:** Associated factors; cleaners; musculoskeletal disorders; prevalence.

**Evidence Level:** 4B

**Link:** <https://www.dovepress.com/prevalence-and-associated-factors-of-musculoskeletal-disorders-among-c-peer-reviewed-article-JPR>

### **Work-related musculoskeletal disorders and associated factors among bankers in Ethiopia, 2018**

**Background:** Work-related musculoskeletal disorders (WMSDs) are an important public health problem in working environments. WMSDs are the major causes of disability and cause individual suffering and financial burdens to the individual, families, industry or employer, healthcare system, and society at large. This study aims to assess the prevalence and associated factors of work-related musculoskeletal disorders among bankers working in Mekelle city, Tigray, Ethiopia, 2018. This study is based on an institutional-based cross-sectional study design, where 328 bankers are selected randomly from bankers working in Mekelle city from February to June 2018. Data were entered, organized, and analyzed by SPSS version 23. A final logistic model was run to identify factors associated with WMSDs, and the magnitude and direction of association were decided based on the adjusted odds ratio (AOR) and its corresponding 95% confidence interval (95% CI). **Result:** Out of 307 bankers, the annual prevalence rate of WMSDs was 65.5% (201). Significant predictors were being 30-39 years old [AOR = 5.552; 95% CI = 1.465-21.039] and above 40 years old [AOR = 5.719; 95% CI = 1.422-22.994], low educational level [AOR = 4.256; 95% CI = 1.139-15.895], working > 5 years [AOR = 3.892; 95% CI = 1.841-8.231], not doing physical exercises [AOR = 2.866; 95% CI = 1.303-6.304], stress [AOR = 4.723; 95% CI = 2.421-9.213], poor posture [AOR = 2.692; 95% CI = 1.339-5.411], breaks [AOR = 5.170; 95% CI = 2.070-12.912], and ergonomics [AOR = 3.801; 95% CI = 1.260-11.472]. **Conclusion:** The prevalence of WMSDs among bankers was high. The significant associated factors responsible for the occurrence of work-related musculoskeletal disorders include longer working experience, being above 30 years old, low educational status, physical exercise, job stress, poor posture, absence of breaks during working hours, and absence of ergonomic training.

**Kibret et al. 2020.**

**Pain Research and Management.**

**User License:**

**Keywords:** Work-related; musculoskeletal disorders; bankers; Ethiopia.

**Evidence Level:** 4B

**Link:** <https://www.hindawi.com/journals/prm/2020/8735169/>

### **Prevalence of work-related musculoskeletal symptoms and associated risk factors among domestic gas workers and staff of works department in Enugu, Nigeria: A cross-sectional study**

**Background:** The impact of work-related musculoskeletal symptoms (WMSS) permeates various occupations. **Objective:** To compare WMSS and associated risk factors among domestic gas workers (DGWs) and staff of Works Department (SWD) in Enugu. **Methods:** One-hundred adults (DGW = 50, SWD = 50) participated in this cross-sectional study. The Nordic Musculoskeletal Questionnaire and a demographics questionnaire were used to assess the prevalence of WMSS and related risk factors. Data were analysed using independent t-test or Mann-Whitney U, chi-square, and logistic regression at  $p < 0.05$ . **Results:** The DGWs (86%) had a significantly ( $\chi^2 = 24.45$ ,  $p < 0.001$ ) higher WMSS than the SWD (38%). Lower-back (54%) and shoulder (52%) were the most affected body parts among the DGWs in comparison to the hips/thighs (20%) among the SWD. Work-related factors such as daily work-duration ( $\chi^2 = 75.44$ ,  $p < 0.001$ ), lifting training ( $\chi^2 = 96.24$ ,  $p < 0.001$ ), and use of personal protective equipment (PPE) of facemask ( $\chi^2 = 100.0$ ,  $p < 0.001$ ) and gloves ( $\chi^2 = 96.09$ ,  $p < 0.001$ ) were significantly associated with general WMSS among the DGWs. However, diastolic blood pressure (DBP) (OR = 1.29,  $p = 0.018$ ), work duration > 8 h/day (OR = 0.001,  $p = 0.028$ ), female gender (OR = 6.98-10.26,  $p < 0.05$ ), sleep duration < 6 h/day (OR = 0.56-0.73,  $p < 0.05$ ) and poor exercise behaviour (OR = 0.15,  $p = 0.013$ ) were the identified independent risk factors of WMSS among DGWs, while DBP (OR = 0.99,  $p = 0.012$ ) and female gender (OR = 6.47,  $p = 0.032$ ) were the only identified independent risk factors for SWD. **Conclusion:** WMSS is significantly higher among DGWs than the SWD. High DBP, female gender, working beyond 8 h per day, sleeping less than 6 h per day, and insufficient exercise increase the risks of WMSDs, especially among the DGWs. To mitigate the adverse effects of WMSDs, SWD and DGWs require break and leave periods, PPE and assistive devices, exercise, medical check-up, and workplace ergonomics.

**Oluka et al. 2020.**

**BMC Musculoskeletal Disorders, vol. 21, no. 1.**

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**Keywords:** Ergonomics; exercise; manual handling; musculoskeletal disorders; personal protective equipment; prevalence; shift duty.

**Evidence Level:** 4B

**Link:** <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-020-03615-5>

### **Is low-back pain a limiting factor for senior workers with high physical work demands? A cross-sectional study**

**Background:** Low-back pain (LBP) is highly prevalent among senior workers and may affect work ability, especially among those with hard physical work. This study determined the joint association of LBP intensity and physical work demands with work limitations due to pain in senior workers. **Methods:** In the SeniorWorkingLife study (2018), 11,738 senior workers ( $\geq 50$  years) replied to questions about physical work demands, LBP intensity, and work limitations due to pain. Using logistic regression analyses and controlling for potential confounders, associations between the physical work demands and LBP intensity (interaction) with work limitations due to pain (outcome) was modeled. **Results:** Higher LBP intensity, as well as higher physical work demands, significantly increased the odds of experiencing work limitations due to pain, and these two factors interacted with each other ( $p < 0.0001$ ). In analyses stratified for LBP intensity, higher physical work demands gradually increased the odds of experiencing work limitations due to pain. **Conclusions:** Senior workers with a combination of physically demanding work and LBP are more affected by their pain during everyday work tasks compared to workers with similar LBP-intensity in sedentary occupations. Accommodation of work demands seems especially relevant for this group of workers.

**Nygaard et al. 2020.**

**BMC Musculoskeletal Disorder, vol. 21, no. 1.**

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**Keywords:** Ergonomics; low-back; musculoskeletal disease; occupational medicine; physical work; sustainable employment; work ability; work limitations; workplace.

**Evidence Level:** 4A

**Link:** <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-020-03643-1>

### **Effectiveness of workplace intervention strategies in lower back pain prevention: A review**

The aim of this study was to identify effective workplace intervention strategies for the prevention of low back pain (LBP). The study focused on interventions to two major groups: personal interventions and technical interventions. Data basis were searched for with inclusion criteria: study design based on randomised controlled trial; outcome measures including non-specific LBP occurrence expressed by prevalence or intensity; intervention met the definition of the technical and/or personal (physical exercises, behavioural training, educational) intervention programme. Eighteen papers were selected for full analysis. The diversification of quantitative indicators of differences between control and intervention groups were carried out using Cohen's d index. The results of analysis showed strong differences in effects among intervention strategies, as well as among different cases within similar intervention strategies. LBP severity before intervention and the length of intervention were discussed as potentially influencing factors. The results of the analysis suggest that the most effective strategies for LBP prevention include technical modifications of the workstand and education based on practical training. Behavioural and physical training seems to be of lesser importance. LBP severity before intervention and the time when the measurements of outcome measures take place play an important role in the effectiveness of intervention.

**Danuta et al. 2020.**

**Industrial Health, vol. 24**

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**Keywords:** Behavioural training; personal intervention; physical exercises; technical intervention.

**Evidence Level:** 1B

**Link:** [https://www.istage.ist.go.jp/article/indhealth/advpub/0/advpub\\_2020-0130/article](https://www.istage.ist.go.jp/article/indhealth/advpub/0/advpub_2020-0130/article)

## **COVID 19**

### **Adapting to the Future of Work**

### **Women's and men's work, housework and childcare, before and during COVID-19**

Evidence from past economic crises indicates that recessions often affect men's and women's employment differently, with a greater impact on male-dominated sectors. The current COVID-19 crisis presents novel characteristics that have affected economic, health and social phenomena over wide swaths of the economy. Social distancing measures to combat the spread of the virus, such as working from home and school closures, have placed an additional tremendous burden on families. Using new survey data collected in April 2020 from a representative sample of Italian women, we analyse the effects of working arrangements due to COVID-19 on housework, childcare and home schooling among couples where both partners work. Our results show that most of the additional housework and childcare associated to COVID-19 falls on women while childcare activities are more equally shared within the couple than housework activities. According to our empirical estimates, changes to the amount of housework done by women during the emergency do not seem to depend on their partners' working arrangements. With the exception of those continuing to work at their usual place of work, all of the women surveyed spend more time on housework than before. In contrast, the amount of time men devote to housework does depend on their partners' working arrangements: men whose partners continue to work at their usual workplace spend more time on housework than before. The link between time devoted to childcare and working arrangements is more symmetric, with higher percentages of both women and men spending less time with their children if they continue to work away from home. For home schooling, too, parents who continue to go to their usual workplace after the lockdown are less likely to spend greater amounts of time with their children than before. Similar results emerge for the partners of women not working before the emergency. Finally, analysis of work-life balance satisfaction shows that working women with children aged 0-5 are those who find balancing work and family more difficult during COVID-19. The work-life balance is especially difficult to achieve for those with partners who continue to work outside the home during the emergency.

**Del Boca et al. 2020.**

**Review of Economics of the Household, vol. 6.**

**User License:** *PMC Open Access Subset*

**Keywords:** COVID-19; childcare; housework; work arrangements.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7474798/>

### **Working from home and income inequality: Risks of a 'new normal' with COVID-19**

In the current context of the COVID-19 pandemic, working from home (WFH) became of great importance for a large share of employees since it represents the only option to both continue working and minimise the risk of virus exposure. Uncertainty about the duration of the pandemic and future contagion waves even led companies to view WFH as a 'new normal' way of working. Based on influence function regression methods, this paper explores the potential consequences in the labour income distribution related to a long-lasting increase in WFH feasibility among Italian employees. Results show that a positive shift in WFH feasibility would be associated with an increase in average labour income, but this potential benefit would not be equally distributed among employees. Specifically, an increase in the opportunity to WFH would favour male, older, high-educated, and high-paid employees. However, this 'forced innovation' would benefit more employees living in provinces have been more affected by the novel coronavirus. WFH thus risks exacerbating pre-existing inequalities in the labour market, especially if it will not be adequately regulated. As a consequence, this study suggests that policies aimed at alleviating inequality, like income support measures (in the short run) and human capital interventions (in the long run), should play a more important compensating role in the future.

**Bonacini et al. 2020.**

**Journal of Population Economics, vol. 12.**

**User License:** *PMC Open Access Subset*

**Keywords:** COVID-19; inequality; unconditional quantile regressions; working from home.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7486597/>

### **Business closures, stay-at-home restrictions, and COVID-19 testing outcomes in New York City**

**Introduction:** In response to the coronavirus disease 2019 (COVID-19) pandemic, New York City closed all nonessential businesses and restricted the out-of-home activities of residents as of March 22, 2020. This order affected different neighborhoods differently, as stores and workplaces are not randomly distributed across the city, and different populations may have responded differently to the out-of-home restrictions. This study examines how the business closures and activity restrictions affected COVID-19 testing results. An evaluation of whether such actions slowed the spread of the pandemic is a crucial step in designing effective public health policies. **Methods:** Daily data on the fraction of COVID-19 tests yielding a positive result at the zip code level were analyzed in relation to the number of visits to local businesses (based on smartphone location) and the number of smartphones that stayed fixed at their home location. The regression model also included vectors of fixed effects for the day of the week, the calendar date, and the zip code of residence. **Results:** A large number of visits to local businesses increased the positivity rate of COVID-19 tests, while a large number of smartphones that stayed at home decreased it. A doubling in the relative number of visits increases the positivity rate by about 12.4 percentage points (95% CI, 5.3 to 19.6). A doubling in the relative number of stay-at-home devices lowered it by 2.0 percentage points (95% CI, -2.9 to -1.2). The business closures and out-of-home activity restrictions decreased the positivity rate, accounting for approximately 25% of the decline observed in April and May 2020. **Conclusion:** Policy measures decreased the likelihood of positive results in COVID-19 tests. These specific policy tools may be successfully used when comparable health crises arise in the future.

**Borjas et al. 2020.**

**Preventing Chronic Disease, vol. 17, no. 17.**

**Keywords:** Business closures; stay-at-home restrictions; COVID-19; testing; New York City.

**Evidence Level:** 5B

**Link:** [https://www.cdc.gov/pcd/issues/2020/20\\_0264.htm](https://www.cdc.gov/pcd/issues/2020/20_0264.htm)

### **Slowly coming out of COVID-19 restrictions in Australia: Implications for working from home and commuting trips by car and public transport**

With the onset of COVID-19 restrictions and the slow relaxing of many restrictions, it is imperative that we understand what this means for the performance of the transport network. In going from almost no commuting, except for essential workers, to a slow increase in travel activity with working from home (WFH) continuing to be both popular and preferred, this paper draws on two surveys, one in late March at the height of restrictions and one in late May as restrictions are starting to be partially relaxed, to develop models for WFH and weekly one-way commuting travel by car and public transport. We compare the findings as one way to inform us of the extent to which a sample of Australian residents have responded through changes in WFH and commuting. While it is early days to claim any sense of a new stable pattern of commuting activity, this paper sets the context for ongoing monitoring of adjustments in travel activity and WFH, which can inform changes required in the revision of strategic metropolitan transport models as well as more general perspectives on future transport and land use policy and planning.

**Beck et al. 2020.**

**Journal of Transport Geography, vol. 88.**

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

**Keywords:** Australian evidence; COVID-19; coronavirus; frequency of modal commuting; household surveys; ordered logit WFH model; poisson regression; travel activity; working from home.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462783/>

### **Guiding and Supporting Mental Health and Wellbeing**

**Associations of mental health and personal preventive measure compliance with exposure to COVID-19 information during work resumption following the COVID-19 outbreak in China: Cross-sectional survey study**

**Background:** Risk and crisis communication plays an essential role in public health emergency responses. The COVID-19 pandemic has triggered spontaneous and intensive media attention, which has affected people's adoption of personal preventive measures and their mental health. **Objective:** The aim of this study was to investigate the associations between exposure to COVID-19-specific information and mental health (depression and sleep quality) and self-reported compliance with personal preventive measures (face mask wearing and hand sanitizing). We also tested whether these associations were moderated by thoughtful consideration of the veracity of the information to which people were exposed. **Methods:** A cross-sectional, closed web-based survey was conducted among a sample of 3035 factory workers at the beginning of work resumption following the COVID-19 outbreak in Shenzhen, China. A stratified two-stage cluster sampling design was used for recruitment. Multivariate linear and logistic regression models were used for the analyses. **Results:** The prevalence of probable moderate-to-severe depression was 170/3035 (5.6%), while that of good or excellent sleep quality was 2110/3035 (69.5%). The prevalence of self-reported consistent face mask wearing in public places was 2903/3035 (95.7%), while that of sanitizing hands every time after returning from public spaces or touching public installations was 2151/3035 (70.9%). Of the 3035 respondents, 1013 to 1638 (33.3% to 54.0%) reported >1 hour of daily exposure to COVID-19-specific information through web-based media and television. After controlling for significant background variables, higher information exposure via television and via newspapers and magazines was associated with better sleep quality and higher compliance with hand sanitizing. Higher exposure via unofficial web-based media was associated with higher compliance with hand sanitizing but was also associated with higher depressive symptoms. In contrast, higher exposure through face-to-face communication was associated with higher depressive symptoms, worse sleep quality, and lower compliance with hand sanitizing. Exposure to information about positive outcomes for patients with COVID-19, development of vaccines and effective treatments, and heroic stories about frontline health care workers were associated with both better mental health and higher compliance with preventive measures. Higher overall information exposure was associated with higher depressive symptoms among participants who were less likely to carefully consider the veracity of the information to which they were exposed; it was also associated with better sleep quality among people who reported more thoughtful consideration of information veracity. **Conclusions:** This study provides empirical evidence of how the amount, sources, and contents of information to which people were exposed influenced their mental health and compliance with personal preventive measures at the initial phase of work resumption in China. Thoughtful consideration of information quality was found to play an important moderating role. Our findings may inform strategic risk communication by government and public health authorities during the COVID-19 pandemic.

**Pan et al. 2020.**

**Journal of Medical Internet Research, vol. 22, no. 10.**

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**Keywords:** COVID-19; China; communication; cross-sectional; information exposure; mental health; personal preventive measures; prevention; public health; risk.

**Evidence Level:** 4B

**Link:** <https://www.jmir.org/2020/10/e22596/>

### **The deterioration of mental health among healthcare workers during the COVID-19 outbreak: A population-based cohort study of workers in Japan**

**Objectives** This study compared the longitudinal change in the mental health of healthcare and non-healthcare workers during two months of the COVID-19 outbreak in Japan. **Methods** Data were derived from a prospective online cohort study of 1448 full-time employees in Japan. Participants were surveyed at baseline from 19-22 March 2020 (T1) and at follow-up from 22-26 May 2020 (T2). A self-administered online questionnaire was used to assess participants' fear and worry of COVID-19, psychological distress, and physical symptoms at T1 and T2. A series of generalized linear models were created to assess changes in outcomes between healthcare and non-healthcare workers. Demographic variables (i.e., sex, age, marital status, child[ren], education, and residential area) were included in the models as covariates. **Results** A total of 1032 participants completed the follow-up questionnaire at T2 (follow-up rate, 72.6%). After excluding unemployed respondents (N=17), the final sample comprised 1015 full-time employees (111 healthcare and 904 non-healthcare workers). After adjusting for the covariates, psychological distress (and



subscales of fatigue, anxiety, and depression) as well as fear and worry of COVID-19 increased statistically significantly more among healthcare than non-healthcare workers from T1 to T2. **Conclusions** Psychological distress, together with fear and worry of COVID-19, increased more among healthcare compared to non-healthcare workers during the COVID-19 outbreak. The study confirmed that healthcare workers are an important target for mental healthcare during the COVID-19 outbreak.

**Sasaki et al. 2020.**

**Scandinavian Journal of Work and Environmental Health.**

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**Keywords:** Mental health; healthcare; COVID-19; Japan.

**Evidence Level:** 4B

**Link:** [https://www.sjweh.fi/show\\_abstract.php?abstract\\_id=3922](https://www.sjweh.fi/show_abstract.php?abstract_id=3922)

### **Analysis of the influence of psychological contract on employee safety behaviors against COVID-19**

This study explored the influencing factors of safety behavior from the perspective of employees, studied the mechanism of the psychological contract on employees' safety behavior in the context of the Chinese epidemic situation, tested the mediating role of job burnout and perceived insider status in the process of work resumption, and provided preventive suggestions for combating the global spread of COVID-19. A questionnaire survey was utilized to collect data and, combined with the necessary protective measures taken for employees in China, was used to modify the mature safety behavior scale. Finally, through the analysis of 402 employees' questionnaires, the hypotheses were verified; that is, in the process of Chinese enterprises returning to work to cope with COVID-19, the psychological contract has a positive role in promoting employees' safety behavior, while job burnout plays a weakened mediating role, and perceived insider status plays a strengthening mediating role. The psychological contract negatively affects job burnout but positively affects perceived insider status. Job burnout negatively affects employees' safety behavior, but perceived insider status positively affects employees' safety behavior. The results show that employees' conscious participation in safety behavior plays an irreplaceable role in the prevention of COVID-19 and safety of work resumption.

**Du et al. 2020.**

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

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**Keywords:** COVID-19; double mediators; job burnout; perceived insider status; psychological contract; safety behavior.

**Evidence Level:** 5B

**Link:** <https://www.mdpi.com/1660-4601/17/18/6747>

### **Health-related factors of psychological distress during the COVID-19 pandemic among non-health workers in Spain**

**Background:** Non-health workers engaged in essential activities during the pandemic are less researched on the effects of COVID-19 than health workers. **Objective:** to study the differences between those who work away from home and those who do so from home, when the effects of fear of contagion cross with those of confinement, about the psychological distress during the COVID-19 in Spain. **Design:** Observational descriptive cross-sectional study. **Data sources:** The study was carried out receiving 1089 questionnaires from non-health workers that were working away from home and doing so from their homes. The questionnaire included sociodemographic and occupational data, physical symptoms, self-perceived health, use of preventive measures and possible contacts, and the Goldberg GHQ-12. **Results:** 71.6% of non-health female workers and 52.4% of non-health male workers had psychological distress, with differences among those working away from home and those working from home. The level of psychological distress among non-health workers is predicted by 66.5% through the variables: being a woman, 43 years old or younger, having a home with no outdoor spaces, poor perception of health, number of symptoms, and having been in contact with contaminated people or material. Among workers who work away from home, being self-employed is another predictive variable of distress. **Conclusion:** More than the half of the sample showed inadequate management of the psychological distress. There are modifiable factors which provide

necessary elements to support a positive attitude of the workers, such as: knowledge of hygiene, transmission of the virus, protective measures, and social distancing measures.

**Ruiz-Frutos et al. 2020.**

**Safety Science, vol. 133.**

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

**Keywords:** COVID-19; mental health; non-health workers; pandemic; psychological distress; public health; quarantine; workers.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7489927/>

### **Information on COVID-19 and psychological distress in a sample of non-health workers during the pandemic period**

Methods by which the population should be informed when going through a pandemic such as COVID-19 have been questioned because of its influence on the adoption of preventive measures and its effects on mental health. Non-health workers are at risk of psychological distress from exposure to contaminated people or materials or by having to stay at home and adapt their activity to telework. The objective of the study is to analyze information the public receives about COVID-19 and its influence on their level of distress. For this, 1089 questionnaires from non-health workers were collected online between 26 March and 26 April 2020 in Spain, and analysed and distributed by snowball effect. 492 participants carried out essential activities away from home, and 597 did so from home. They were surveyed about information received about COVID-19 regarding its source, time, assessment, or the beliefs expressed in it. Mental health was also measured with Goldberg's General Health Questionnaire (GHQ-12). The classification and regression tree (CART) method was used to design a binary tree with sample cases. It has been found that the time spent learning about COVID-19 and the level of knowledge about symptoms, pathways, prevention, treatment, or prognosis are associated with the level of distress, where 25% of participants were found to have spent more than 3 h daily on this activity. Social media and television are the most widely used sources, but they are considered to be of lower quality and usefulness than official sources. There is greater confidence in healthcare professionals than in the health system, and the main concern of those working away from home is spreading the virus to family members. It has been concluded that there is a need to enhance quality and truthful information on the Internet for non-health workers due to its accessibility, which should be constantly updated, a fact which international and national public bodies, research centers, and journal publishers have begun to understand during the current pandemic. Such quality information is needed to combat distress.

**Ruiz-Frutos et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 19.**

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**Keywords:** COVID-19; coronavirus; information; internet; knowledge; mental health; non-health workers; occupational health; pandemic; psychological distress.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/19/6982>

## **Enabling Healthy and Safe Workplaces**

### **COVID-19 exposure risk for family members of healthcare workers: An observational study**

**Background:** Many publications have considered the exposure risk to COVID-19 of the general population and healthcare workers. However, no available papers have discussed the risk of exposure by family members of health care workers. **Aims:** The present study collected data on SARS-COV-2 positive family members (FM) of health care workers (HW) using serological rapid IgM/IgG tests (SRT), compared to positive HWs on SRT and serological quantitative IgG tests (SQT). **Methods:** The study was conducted from May 2 to 31, 2020. Thirty-eight HWs were tested by both SRT and SQT; 81 FMs were screened using SRT. Descriptive statistical analyses were used to summarize the data. **Results:** Of the 38 HWs, two (5,3%) showed an IgG line on SRT, confirmed by SQT. Thirty-two HWs decided on self-isolation from the family

during the SARS-COV-2 spread. Out of 81 FMs, 26 (32,1%) were found IgG positive on SRT. Eleven (42%) of them had symptoms typical for COVID-19, during the study period. In two families, the HWs were the only negative cases. **Conclusions:** The general population's exposure to COVID-19 is less controlled than that of HWs. HWs experienced a lower infection rate than their families and did not represent a main transmission risk for relatives.

**Lorenzo et al. 2020.**

**International Journal of Infectious Diseases, vol. 98.**

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**Keywords:** COVID-19; infection of healthcare workers; rapid serological test; SARS-COV-2.

**Evidence Level:** 5B

**Link:** [https://www.ijidonline.com/article/S1201-9712\(20\)30541-5/fulltext](https://www.ijidonline.com/article/S1201-9712(20)30541-5/fulltext)

### **Measures to protect the health and safety of Massachusetts employees who must work at the workplace during the SARS-CoV-2 pandemic**

The Massachusetts Coalition for Occupational Safety and Health (MassCOSH) developed workplace health and safety recommendations for Phase 2 of the Massachusetts plans to reopen the economy as the spread of SARS-CoV-2 novel coronavirus was reduced in the state. The governor's plan included minimal measures for workplace health and safety protections during this pandemic. The MassCOSH recommendations are presented in this document.

**Brozan et al. 2020.**

**New Solutions – A Journal of Environmental and Occupational Health Policy, vol. 22.**

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**Keywords:** COVID-19; Massachusetts; economic reopening; worker health and safety.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7511801/>

### **COVID-19 outbreaks in a transmission control scenario: Challenges posed by social and leisure activities, and for workers in vulnerable conditions, Spain, early summer 2020**

Severe acute respiratory syndrome coronavirus 2 community-wide transmission declined in Spain by early May 2020, being replaced by outbreaks and sporadic cases. From mid-June to 2 August, excluding single household outbreaks, 673 outbreaks were notified nationally, 551 active (>6,200 cases) at the time. More than half of these outbreaks and cases coincided with: (i) social (family/friends' gatherings or leisure venues) and (ii) occupational (mainly involving workers in vulnerable conditions) settings. Control measures were accordingly applied.

**Euro Surveillance 2020.**

**Euro Surveillance, vol. 25, no. 35.**

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**Keywords:** COVID-19; Spain; outbreak; transmission.

**Evidence Level:** 6B

**Link:** <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.35.2001545>

### **Data on occupational health and safety strategies influencing the reduction of coronavirus in South Africa**

This data article describes raw statistics on occupational health and safety strategies influencing the reduction of coronavirus in South Africa. The purpose of this research was to investigate factors that could potentially influence the reduction of the spread of COVID-19 in a municipality setting. The following independent constructs are explored: physical wellness, psychological wellness, intellectual wellness, emotional wellness and social wellness. In addition to the individual dependent variables, the influence of these constructs on the reduction of COVID-19 transmission and employee performance at a selected municipality was tested. Hypotheses emerged from the proposed influence of each of these constructs on reduction of COVID-19 transmission at a municipality. Smart PLS was used to measure the impact of the proposed hypotheses of the research. In order to describe data on the respondents' characteristics, SPSS

and SMART PLS was used to generate the relevant statistics. The data generated for this research could potentially advise on how healthy and safety strategies could contribute to lowering the transmission of COVID-19 at a municipality.

**Rukuni et al. 2020.**

**Data in Brief, vol. 32.**

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**Keywords:** Emotional wellness; intellectual wellness; physical wellness; psychological wellness; reduction of COVID-19 transmission at the municipality; social wellness; employee performance.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S235234092031194X?via%3Dihub>

### **Evaluating lubricant performance to reduce COVID-19 PPE-related skin injury**

**Background:** Healthcare workers around the world are experiencing skin injury due to the extended use of personal protective equipment (PPE) during the COVID-19 pandemic. These injuries are the result of high shear stresses acting on the skin, caused by friction with the PPE. This study aims to provide a practical lubricating solution for frontline medical staff working a 4+ hours shift wearing PPE. **Methods:** A literature review into skin friction and skin lubrication was conducted to identify products and substances that can reduce friction. We evaluated the lubricating performance of commercially available products in vivo using a custom-built tribometer. **Findings:** Most lubricants provide a strong initial friction reduction, but only few products provide lubrication that lasts for four hours. The response of skin to friction is a complex interplay between the lubricating properties and durability of the film deposited on the surface and the response of skin to the lubricating substance, which include epidermal absorption, occlusion, and water retention.

**Interpretation:** Talcum powder, a petrolatum-lanolin mixture, and a coconut oil-cocoa butter-beeswax mixture showed excellent long-lasting low friction. Moisturising the skin results in excessive friction, and the use of products that are aimed at 'moisturising without leaving a non-greasy feel' should be prevented. Most investigated dressings also demonstrate excellent performance.

**Masen et al. 2020.**

**PLoS One, vol. 15, no. 9.**

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**Keywords:** COVID-19; PPE; lubricant; skin injury.

**Evidence Level:** 6A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239363>

### **Occupational factors in the COVID-19 pandemic in Italy: Compensation claims applications support establishing an occupational surveillance system**

**Introduction:** The SARS-CoV-2 pandemic is an impacting challenge for occupational health. Epidemiological surveillance of COVID-19 includes systematic tracking and reporting of the total cases and deaths, but suitable experiences of surveillance systems for identifying the occupational risk factors involved in the COVID-19 pandemic are still missing, despite the interest for occupational safety and health. **Methods:** A methodological approach has been implemented in Italy to estimate the occupational risk of infection, classifying each economic sector as at low, medium-low, medium-high and high risk, based on three parameters: exposure probability, proximity index and aggregation factor. Furthermore, during the epidemic emergency, the Italian Workers' Compensation Authority introduced the notation of COVID-19 work-related infection as an occupational injury and collected compensation claims of workers from the entire national territory. **Results:** According to compensation claims applications, COVID-19 infection in Italy has been acquired at the workplace in a substantial portion of the total cases (19.4%). The distribution of the economic sectors involved is coherent with the activities classified at risk in the lockdown period. The economic sectors mostly involved were human health and social work activities, but occupational compensation claims also include cases in meat and poultry processing plants workers, store clerks, postal workers, pharmacists and cleaning workers. **Conclusions:** There is a need to go towards an occupational surveillance system for COVID-19 cases, including an individual anamnestic analysis of the circumstances in

which the infection is acquired, for the prevention of occupational infectious risk, supporting insurance system effectiveness and managing vaccination policies.

**Marrinaccio et al. 2020.**

**Occupational and Environmental Medicine.**

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**Keywords:** Health and safety; occupational health practice; public health.

**Evidence Level:** 5B

**Link:** <https://oem.bmj.com/content/early/2020/09/23/oemed-2020-106844.long>

### **Social distancing and public health guidelines at workplaces in Korea: Responses to coronavirus disease-19**

**Background:** In the absence of a vaccine or treatment, the most pragmatic strategies against an infectious disease pandemic are extensive early detection testing and social distancing. This study aimed to summarize public and workplace responses to Coronavirus Disease-19 (COVID-19) and show how the Korean system has operated during the COVID-19 pandemic. **Method:** Daily briefings from the Korean Center for Disease Control and the Central Disaster Management Headquarters were assembled from January 20 to May 15, 2020. **Results:** By May 15, 2020, 11,018 COVID-19 cases were identified, of which 15.7% occurred in workplaces such as health-care facilities, call centers, sports clubs, coin karaoke, and nightlife destinations. When the first confirmed case was diagnosed, the Korean Center for Disease Control and Central Disaster Management Headquarters responded quickly, emphasizing early detection with numerous tests and a social distancing policy. This slowed the spread of infection without intensive containment, shut down, or mitigation interventions. After entering the public health blue alert level, a business continuity plan was distributed. After entering the orange level, the Ministry of Employment and Labor developed workplace guidelines for COVID-19 consisting of social distancing, flexible working schedules, early identification of workers with suspected infections, and disinfection of workplaces. Owing to the intensive workplace social distancing policy, workplaces remained safe with only small sporadic group infections. **Conclusion:** The workplace social distancing policy with timely implementation of specific guidelines was a key to preventing a large outbreak of COVID-19 in Korean workplaces. However, sporadic incidents of COVID-19 are still ongoing, and risk assessment in vulnerable workplaces should be continued.

**Kim et al. 2020.**

**Safety and Health at Work, vol. 11, no. 3.**

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**Keywords:** COVID-19; public health; public health surveillance; social distance; workplace.

**Evidence Level:** 6B

**Link:** <https://www.sciencedirect.com/science/article/pii/S2093791120303103?via%3Dihub>

### **Adult congenital heart disease and the COVID-19 pandemic**

Adults with congenital heart disease (ACHD) may be at high risk in the case of COVID-19. Due to the heterogeneity of ACHD and secondary complications, risk profiles are, however, not uniform. This document aims to give an overview of relevant data and outline our pragmatic approach to disease prevention and management. Based on anatomy and additional physiological factors including symptoms, exercise capacity, heart failure, pulmonary hypertension and cyanosis, we propose a pragmatic approach to categorising patients into low-risk, intermediate-risk and high-risk groups. We regard especially patients with complex cyanotic conditions, those with palliated univentricular hearts, heart failure, severe valvular disease or pulmonary hypertension as high-risk patients. To avoid infection, we recommend self-isolation and exemption from work for these cohorts. Infected ACHD patients with low or moderate risk and without signs of deterioration may be remotely followed and cared for at home while in self isolation. High-risk patients or those with signs of respiratory or cardiovascular impairment require admission ideally at a tertiary ACHD centre. Especially patients with complex, cyanotic disease, heart failure and arrhythmias require particular attention. Treatment in patients with cyanotic heart disease should be guided by the relative degree of desaturation compared with baseline and lactate levels rather than absolute oxygen

saturation levels. Patients with right heart dilatation or dysfunction are potentially at increased risk of right heart failure as mechanical ventilation and acute respiratory distress syndrome can lead to increase in pulmonary arterial pressures.

**Radke et al. 2020.**

**Heart, vol. 106, no. 17.**

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**Keywords:** Congenital heart disease; adult; COVID-19; high risk.

**Evidence Level:** 6A

**Link:** <https://heart.bmj.com/content/106/17/1302.long>

### **Impact of COVID-19 on life experiences of essential workers attending a dental testing facility**

**Objectives:** 1) To compare the impact of COVID-19 on the life experiences of essential workers attending a COVID-19 antibody testing clinic at a dental school. 2) To compare responses of dental, non-dental health care, and non-health care essential workers. 3) To assess acceptability/satisfaction of testing done in a dental setting. **Method:** A total of 984 participants completed a self-administered online questionnaire.

**Results:** Over 90% were healthy (i.e., not in a high-risk health-related group for COVID-19), did not have COVID-19 symptoms within 30 d, and always/frequently engaged in preventive measures. Fifty-eight percent thought that they had a 0% to 25% chance of having immunity/antibodies to COVID-19. Non-dental health care workers thought that their chance was significantly higher ( $P < 0.05$ ) than others. Over 70% were sometimes, frequently, or always worried about their friends and loved ones getting COVID-19 and of resulting financial problems. Dental workers were significantly less afraid than non-dental health care and non-health care providers. For all groups, more than half of the respondents stated that the pandemic had a negative (somewhat worse or worse) impact on daily life (59%), interactions with others (65%), stress levels (66%), and enjoyment of life (56%). There were significant differences among all 3 groups regarding the percentage of individuals with a negative impact on job security (dental, 47%; non-dental health care, 34%; non-health care, 31%). However, more than half of the respondents stated that the pandemic had a positive impact (same, somewhat better, or much better) on caring about one another, self-care, and exercise. Knowing the results of an antibody test would decrease the level of stress and anxiety in 67% of respondents. Over 80% found a COVID-19 test received in a dental setting acceptable, were "definitely" satisfied, and would "definitely" recommend it to a friend, family, or coworker. **Conclusions:** These findings support that dental workers are as vulnerable as other essential workers to threats and psychological impacts of COVID-19. They also support the acceptability and satisfaction of testing for a pandemic done in a dental setting.

**Fontana et al. 2020.**

**JDR Clinical and Translational Research.**

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**Keywords:** Anxiety; dentist; health care; life quality; pandemic; stress.

**Evidence Level:** 4A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7509243/>

### **Safety considerations during return to work in the context of stable COVID-19 epidemic control: An analysis of health screening results of all returned staff from a hospital**

In March 2020, China had periodically controlled the coronavirus disease-19 (COVID-19) epidemic. We reported the results of health screening for COVID-19 among returned staff of a hospital and conducted a summary analysis to provide valuable experience for curbing the COVID-19 epidemic and rebound. In total, 4729 returned staff from Zhongnan Hospital of Wuhan University, Wuhan, China were examined for COVID-19, and the basic information, radiology and laboratory test results were obtained and systematically analysed. Among the 4729 employees, medical staff (62.93%) and rear-service personnel (30.73%) were the majority. The results of the first physical examination showed that 4557 (96.36%) were normal, 172 (3.64%) had abnormal radiological or laboratory test results. After reexamination and evaluation, four were at high risk (asymptomatic infections) and were scheduled to transfer to a designated hospital, and three were at low risk (infectivity could not be determined) and were scheduled for home isolation observation. Close

contacts were tracked and managed by the Center for Disease Control and Prevention (CDC) in China. Asymptomatic infections are a major risk factor for returning to work. Extensive health screening combined with multiple detection methods helps to identify asymptomatic infections early, which is an important guarantee in the process of returning to work.

**Duan et al. 2020.**

**Epidemiology and Infection, vol. 18**

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**Keywords:** Asymptomatic infection; COVID-19; SARS-CoV-2; return to work; screening.

**Evidence Level:** 4B

**Link:** <https://www.cambridge.org/core/journals/epidemiology-and-infection/article/safety-considerations-during-return-to-work-in-the-context-of-stable-covid19-epidemic-control-an-analysis-of-health-screening-results-of-all-returned-staff-from-a-hospital/FCCE3E549E9BE1096F84F70C3058C6CD>

### **Self-reported compliance with personal preventive measures among Chinese factory workers at the beginning of work resumption following the COVID-19 outbreak: Cross-sectional survey study**

**Background:** Maintaining compliance with personal preventive measures is important to achieve a balance of COVID-19 pandemic control and work resumption. **Objective:** The aim of this study was to investigate self-reported compliance with four personal measures to prevent COVID-19 among a sample of factory workers in Shenzhen, China, at the beginning of work resumption in China following the COVID-19 outbreak. These preventive measures included consistent wearing of face masks in public spaces (the workplace and other public settings); sanitizing hands using soap, liquid soap, or alcohol-based hand sanitizer after returning from public spaces or touching public installations and equipment; avoiding social and meal gatherings; and avoiding crowded places. **Methods:** The participants were adult factory workers who had resumed work in Shenzhen, China. A stratified two-stage cluster sampling design was used. We randomly selected 14 factories that had resumed work. All full-time employees aged  $\geq 18$  years who had resumed work in these factories were invited to complete a web-based survey. Out of 4158 workers who had resumed work in these factories, 3035 (73.0%) completed the web-based survey from March 1 to 14, 2020. Multilevel logistic regression models were fitted. **Results:** Among the 3035 participants, 2938 (96.8%) and 2996 (98.7%) reported always wearing a face mask in the workplace and in other public settings, respectively, in the past month. However, frequencies of self-reported sanitizing hands (2152/3035, 70.9%), avoiding social and meal gatherings (2225/3035, 73.3%), and avoiding crowded places (1997/3035, 65.8%) were relatively low. At the individual level, knowledge about COVID-19 (adjusted odds ratios [AORs] from 1.16, CI 1.10-1.24, to 1.29, CI 1.21-1.37), perceived risk (AORs from 0.58, CI 0.50-0.68, to 0.85, CI 0.72-0.99) and severity (AOR 1.05, CI 1.01-1.09, and AOR 1.07, CI 1.03-1.11) of COVID-19, perceived effectiveness of preventive measures by the individual (AORs from 1.05, CI 1.00-1.10, to 1.09, CI 1.04-1.13), organization (AOR 1.30, CI 1.20-1.41), and government (AORs from 1.14, CI 1.04-1.25, to 1.21, CI 1.02-1.42), perceived preparedness for a potential outbreak after work resumption (AORs from 1.10, CI 1.00-1.21, to 1.50, CI 1.36-1.64), and depressive symptoms (AORs from 0.93, CI 0.91-0.94, to 0.96, CI 0.92-0.99) were associated with self-reported compliance with at least one personal preventive measure. At the interpersonal level, exposure to COVID-19-specific information through official media channels (AOR 1.08, CI 1.04-1.11) and face-to-face communication (AOR 0.90, CI 0.83-0.98) were associated with self-reported sanitizing of hands. The number of preventive measures implemented in the workplace was positively associated with self-reported compliance with all four preventive measures (AORs from 1.30, CI 1.08-1.57, to 1.63, CI 1.45-1.84). **Conclusions:** Measures are needed to strengthen hand hygiene and physical distancing among factory workers to reduce transmission following work resumption. Future programs in workplaces should address these factors at multiple levels.

**Pan et al. 2020.**

**Journal of Medical Internet Research, vol. 22, no. 9.**

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**Keywords:** COVID-19; compliance; cross-sectional; facemask wearing; hand hygiene; online; physical distancing; prevention; survey; work resumption, factory workers.

**Evidence Level:** 4B

**Link:** <https://www.jmir.org/2020/9/e22457/>

### **Differential occupational risk for COVID-19 and other infection exposure according to race and ethnicity**

**Background:** There are racial and ethnic disparities in the risk of contracting COVID-19. This study sought to assess how occupational segregation according to race and ethnicity may contribute to the risk of COVID-19. **Methods:** Data about employment in 2019 by industry and occupation and race and ethnicity were obtained from the Bureau of Labor Statistics Current Population Survey. This data was combined with information about industries according to whether they were likely or possibly essential during the COVID-19 pandemic and the frequency of exposure to infections and close proximity to others by occupation. The percentage of workers employed in essential industries and occupations with a high risk of infection and close proximity to others by race and ethnicity was calculated. **Results:** People of color were more likely to be employed in essential industries and in occupations with more exposure to infections and close proximity to others. Black workers in particular faced an elevated risk for all of these factors. **Conclusion:** Occupational segregation into high-risk industries and occupations likely contributes to differential risk with respect to COVID-19. Providing adequate protections to workers may help to reduce these disparities.

**Hawkins et al. 2020.**

**American Journal of Industrial Medicine, vol. 63, no. 9.**

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**Keywords:** COVID-19; infectious disease; occupational health; occupational segregation; racial/ethnic disparities.

**Evidence Level:** 4A

**Link:** <https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23145>

### **Migrant workers and COVID-19**

**Objectives:** Daily numbers of COVID-19 in Singapore from March to May 2020, the cause of a surge in cases in April and the national response were examined, and regulations on migrant worker accommodation studied. **Methods:** Information was gathered from daily reports provided by the Ministry of Health, Singapore Statues online and a Ministerial statement given at a Parliament sitting on 4 May 2020. **Results:** A marked escalation in the daily number of new COVID-19 cases was seen in early April 2020. The majority of cases occurred among an estimated 295 000 low-skilled migrant workers living in foreign worker dormitories. As of 6 May 2020, there were 17 758 confirmed COVID-19 cases among dormitory workers (88% of 20 198 nationally confirmed cases). One dormitory housing approximately 13 000 workers had 19.4% of residents infected. The national response included mobilising several government agencies and public volunteers. There was extensive testing of workers in dormitories, segregation of healthy and infected workers, and daily observation for fever and symptoms. Twenty-four dormitories were declared as 'isolation areas', with residents quarantined for 14 days. New housing, for example, vacant public housing flats, military camps, exhibition centres, floating hotels have been provided that will allow for appropriate social distancing. **Conclusion:** The COVID-19 pandemic has highlighted migrant workers as a vulnerable occupational group. Ideally, matters related to inadequate housing of vulnerable migrant workers need to be addressed before a pandemic.

**Koh et al. 2020.**

**Occupational and Environmental Medicine, vol. 77, no. 9.**

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**Keywords:** Migrant workers; occupational health practice.

**Evidence Level:** 6B

**Link:** <https://oem.bmj.com/content/77/9/634.long>

### **Severe acute respiratory syndrome Coronavirus 2 among asymptomatic workers screened for work resumption, China**

After the outbreak in Wuhan, China, we assessed 29,299 workers screened for severe acute respiratory syndrome coronavirus 2 by reverse transcription PCR. We noted 18 (0.061%) cases of asymptomatic



infection; 13 turned negative within 8.0 days, and 41 close contacts tested negative. Among 6 contacts who had serologic tests, none were positive.

**Han et al. 2020.**

**Emerging Infectious Diseases, vol. 26, no. 9.**

**Keywords:** COVID-19; China; SARS; SARS-CoV-2; Wuhan; coronavirus; coronavirus disease; respiratory infections; severe acute respiratory syndrome coronavirus 2; viruses; zoonoses.

**Evidence Level:** 5B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7454110/>