Emerging Evidence Alert
September 2022

This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics published in August 2022 only.

Contents

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Description of Evidence Levels Definitions Used in this Review

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

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

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

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

Fostering Work Participation

Return to Work

This month's studies explore issues associated with the return to work following spinal surgery, ulnar shortening osteotomy and acquired brain injury.

Systematic review and meta-analysis of predictors of return to work after spinal surgery for chronic low back and leg pain

Background: Spinal surgeries to treat chronic low back pain (CLBP) have variable success rates, and despite the significant personal and socioeconomic implications, we lack consensus for prognostic factors. **Methods:** This systematic review and meta-analysis evaluated the evidence for preoperative predictors of return to work (RTW) after spinal surgery for CLBP. We searched electronic databases and references (January 1984 to March 2021), screened 2,622 unique citations, and included 8 reports (5 low and 3 high risk-of-bias) which involved adults with ≥3 months duration of CLBP with/without leg pain undergoing first elective lumbar surgery with RTW assessed ≥3 months later. **Results**: Narrative synthesis and meta-analysis where possible found that individuals less likely to RTW were older (odds ratio [OR] = .58; 95% confidence interval [CI]: 0.46-0.72), not working before surgery, had longer sick leave (OR = .95; 95% CI: 0.93-0.97), higher physical workload, legal representation (OR = .61; 95% CI: 0.53-0.71), psychiatric comorbidities and depression (moderate quality-of-evidence, QoE), and longer CLBP duration and opioid use (low QoE), independent of potential confounders. Low quality and small number of studies limit our confidence in other associations. **Conclusions:** In conclusion, RTW after spinal surgery for CLBP likely depends on sociodemographic and affective psychological factors, and potentially also on symptom duration and opioid use.

Halicka et al. 2022.
The Journal of Pain, vol. 23, no. 8.
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Keywords: Chronic low back pain; lumbar spine; predictors; return to work; spinal surgery.
Evidence Level: 1A
Link: https://www.jpain.org/article/S1526-5900(22)00032-3/fulltext

What does it take to get somebody back to work after severe acquired brain injury? Service actions within the Vocational Intervention Program (VIP 2.0)

Background: Little is known about service actions delivered in the complex intervention of vocational rehabilitation (VR) for people with severe acquired brain injury (ABI). Scale-up of the Vocational Intervention Program (VIP) across the 12 Community teams of the NSW Brain Injury Rehabilitation Program provided an opportunity to analyse the intensity and profile of actions delivered in providing VR programs. Seventy-two participants with severe TBI were supported in returning to either pre-injury employment (FastTrack, FT, *n* = 27) or new employment (NewTrack, NT, *n* = 50), delivered by two types of VR providers (Disability Employment Service DES; private providers). VR providers documented their service actions in hours and minutes, using the Case Management Taxonomy, adapted to VR. The NT pathway required significantly higher levels of intervention in comparison to FT (25 h, five minutes vs. 35 h, 30 min, *p* = 0.048, W = 446). Case coordination was the most frequent service action overall (41.7% of total time for FT, 42.3% for NT). DES providers recorded significantly greater amounts of time undertaking engagement, assessment and planning, and emotional/motivational support actions compared to private providers. Overall duration of the programs were a median of 46 weeks (NT) and 36 weeks (FT), respectively. This study helps illuminate the profile of VR interventions for people with severe TBI.

McRae et al. 2022.
International Journal of Environmental Research and Public Health, vol. 19, no. 15.
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Keywords: Acquired brain injury; case management; return to work; taxonomy; traumatic brain injury; vocational rehabilitation.
Evidence Level: 5A

Return to usual work following an ulnar shortening osteotomy: A sample of 111 patients
Background: The primary aim of this study was to analyze the median time until patients performed their usual work following an ulnar shortening osteotomy (USO). The secondary aim was to identify factors influencing the median time until return to their usual work. **Methods:** We used a retrospective cohort of patients with ongoing data collection from our institution in the Netherlands. Patients with paid employment who underwent USO were invited to complete a return-to-work questionnaire at 6 weeks, 3 months, 6 months, and 12 months after surgery. The probability of and median time until return to usual work were assessed using an inverted Kaplan-Meier analysis. Factors influencing the return to usual work were evaluated using multivariable Cox proportional hazard regression. **Results:** In total, 111 patients who underwent USO were included, with a mean age of 46 years. The probability of returning to usual work in the first year was 92%, and the median time was 12 weeks. The type of work was independently associated with a return to work, with median times of 8, 12, and 14 weeks for light, moderate, and heavy physical work, respectively. We did not find differences in return to usual work based on age, sex, duration of complaints until surgery, treatment side, smoking status, the preoperative Patient-Rated Wrist Evaluation score, or whether the osteotomy was performed freehand or with an external cutting device.
Conclusions: Half of the patients that underwent USO fully performed their usual work by 12 weeks following surgery. We found that 92% of the patients performed their usual work within 1 year after surgery. We found a large variation in the time until a return to work based on the type of work. Surgeons can use this data to inform patients on the rehabilitation phase after USO.
Teunissen et al. 2022.
The Journal of Hand Surgery, vol. 47, no. 8.
Keywords: DRUJ; return to work; ulnar shortening osteotomy.
Evidence Level: 5A

Presenteeism and Absenteeism

This month we explore the ability to predict Covid-19 related sick leave, the rate of Covid-19 related sick leave amongst healthcare workers, and the trajectories of sickness absence and disability pension days among people with multiple sclerosis and white-collar workers in the trade and retail industry.

Predicting past and future SARS-CoV-2-related sick leave using discrete time Markov modelling
Background: Prediction of SARS-CoV-2-induced sick leave among healthcare workers (HCWs) is essential for being able to plan the healthcare response to the epidemic. **Methods:** During first wave of the SARS-Cov-2 epidemic (April 23rd to June 24th, 2020), the HCWs in the greater Stockholm region in Sweden were invited to a study of past or present SARS-CoV-2 infection. We develop a discrete time Markov model using a cohort of 9449 healthcare workers (HCWs) who had complete data on SARS-CoV-2 RNA and antibodies as well as sick leave data for the calendar year 2020. The one-week and standardized longer term transition probabilities of sick leave and the ratios of the standardized probabilities for the baseline covariate distribution were compared with the referent period (an independent period when there were no SARS-CoV-2 infections) in relation to PCR results, serology results and gender. **Results:** The one-week probabilities of transitioning from healthy to partial sick leave or full sick leave during the outbreak as compared to after the outbreak were highest for healthy HCWs testing positive for large amounts of virus (ratio: 3.69, (95% confidence interval, CI: 2.44-5.59) and 6.67 (95% CI: 1.58-28.13), respectively). The proportion of all sick leaves attributed to COVID-19 during outbreak was at most 55% (95% CI: 50%-59%).
Conclusions: A robust Markov model enabled use of simple SARS-CoV-2 testing data for quantifying past

and future COVID-related sick leave among HCWs, which can serve as a basis for planning of healthcare during outbreaks.

Association between COVID-19 and sick leave for healthcare workers in a large academic hospital in southern Italy: An observational study

Background: Studies have shown that the pandemic has led to an increase in sick leave periods among healthcare workers (HCWs); however, this might have changed over time considering increase in vaccination coverage and change in COVID-19 variant predominance. **Methods:** Therefore, we conducted an observational study to evaluate whether the type of symptoms and the duration of sick leave period for healthcare workers working in a large university hospital in the South of Italy changed between January 2021 and January 2022; 398 cases of COVID-19 were identified for a total of 382 subjects involved. **Results:** A total of 191 subjects answered the questionnaire about symptoms; of these, 79 had COVID-19 during the period from March 2020 until February 2022. The results showed a decrease of about 1.2 days in sick leave period for each quarter without finding significant differences in the perception of symptoms. **Conclusions:** It is possible to hypothesize a contribution from the Omicron variant to the decrease in sick leave period in the last quarter, from vaccination coverage, from optimization of COVID-19 management, and from change in the regulations for the assessment of positivity.

Trajectories of sickness absence and disability pension days among people with multiple sclerosis by type of occupation

Background: Multiple sclerosis (MS) can impact working life, sickness absence (SA) and disability pension (DP). Different types of occupations involve different demands, which may be associated with trajectories of SA/DP among people with MS (PwMS). **Objectives:** To explore, among PwMS and references, if SA/DP differ according to type of occupation. Furthermore, to examine how trajectories of SA/DP days are associated with type of occupation among PwMS. **Methods:** A longitudinal nationwide Swedish register-based cohort study was conducted, including 6100 individuals with prevalent MS and 38,641 matched references from the population. Trajectories of SA/DP were identified with group-based trajectory modelling. Multinomial logistic regressions were estimated for associations between identified trajectories and occupations. **Results:** Increase of SA/DP over time was observed in all occupational groups, in both PwMS and references, with higher levels of SA/DP among PwMS. The lowest levels of SA/DP were observed among managers. Three trajectory groups of SA/DP were identified: Persistently Low (55.2%), Moderate Increasing (31.9%) and High Increasing (12.8%). Managers and those working in Science & Technology, and Economics, Social & Cultural were more likely to belong to the Persistently Low group. **Conclusion:** Results suggest that type of occupation plays a role in the level and course of SA/DP.

Trajectories of sickness absence and disability pension days among 189,321 white-collar workers in the trade and retail industry; A 7-year longitudinal Swedish cohort study

Background: 1) identify different trajectories of annual mean number of sickness absence (SA) and disability pension (DP) days among privately employed white-collar workers in the trade and retail industries and 2) investigate if sociodemographic and work-related characteristics were associated with trajectory membership. **Methods**: A longitudinal population-based cohort register study of all white-collar workers in the trade and retail industry in 2012 in Sweden (N = 189,321), with SA and DP data for 2010-2016. Group-based trajectory analysis was used to identify groups of individuals who followed similar trajectories of SA/DP days. Multinomial logistic regression was used to determine associations between sociodemographic and work-related factors and trajectory membership. **Results**: We identified four trajectories of SA/DP days. Most individuals (73%) belonged to the trajectory with 0 days during all seven years, followed by a trajectory of few days each year (24%). Very small minorities belonged to a trajectory with increasing SA/DP days (1%) or to constantly high SA/DP (2%). Men had a lower risk of belonging to any of the three trajectories with SA/DP than women (OR Low SA/DP 0.42, 95% CI 0.41-0.44; Increasing SA/DP 0.34, 0.30-0.38; High SA/DP 0.33, 0.29-0.37). Individuals in occupations with low job control had a higher risk of belonging to the trajectory High SA/DP (OR low demands/low control 1.51; 95% CI 1.25-1.83; medium demands/low control 1.47, 1.21-1.78; high demands/low control 1.35, 1.13-1.61). **Conclusion**: Most white-collar belonged to trajectories with no or low SA/DP. Level of job control was more strongly associated with trajectory memberships than level of job demands.

Farrants et al. 2022.

Building Employer Capability

Wellness Programs

This month we explore a citizen science approach to the design and implementation of workplace health promotion programs, and the interest and barriers to participation in wellness programs among workers with work-related permanent impairments.

The process evaluation of a citizen science approach to design and implement workplace health promotion programs

Background: Many workplace health promotion programs (WHPPs) do not reach blue-collar workers. To enhance the fit and reach, a Citizen Science (CS) approach was applied to co-create and implement WHPPs. This study aims to evaluate i) the process of this CS approach and ii) the resulting WHPPs. **Methods:** The study was performed in two companies: a construction company and a container terminal company. Data were collected by questionnaires, interviews and logbooks. Using the framework of Nielsen and Randall, process measures were categorized in the intervention, context and mental models. Interviews were transcribed and thematically coded using MaxQDA software. **Results:** The involvement in the CS approach and co-creating the WHPPs was positively experienced. Information provision, sustained engagement over time and alignment with the workplace's culture resulted in barriers in the CS process. As to the resulting WHPPs, involvement and interaction during the intervention sessions were particularly experienced in small groups. The reach was affected by the unfavorable planning off the WHPPs and external events of re-originations and the covid-19 pandemic. **Discussion:** Continuous information provision and engagement over time, better alignment with the workplace's culture and favorable planning are considered to be important factors for facilitating involvement, reach and satisfaction of the workers in a Citizen science approach to design and implement a WHPP. Further studies continuously monitoring the process of WHPPs using the CS approach could be helpful to anticipate on external factors and increase the adaptability.

Conclusions: Workers were satisfied with the involvement in WHPPs. Organizational and social cultural factors were barriers for the CS approach and its reach. Involvement and interaction in WHPPs were particularly experienced in small grouped sessions. Consequently, contextual and personal factors need be considered in the design and implementation of WHPPs with CS approach among blue-collar workers.

Workplace wellness program interest and barriers among workers with work-related permanent impairments

Background: Nearly half of U.S. workers have access to workplace wellness programs (WWPs), 58% of workers with access participate. The aim of this study was to assess interest in WWP participation and identify reasons for lack of interest among workers with work-related permanent impairments-a population at elevated risk of adverse health outcomes. **Methods:** Workers who returned to work after a work-related permanent impairment were interviewed 11 to 15 months after workers' compensation claim closure. Qualitative content analysis methods were used to code open-ended responses. **Findings:** Of 560 respondents, 51.4% expressed interest in WWP participation. Numerous adverse health and economic characteristics were associated with WWP interest, for example, interest was expressed by 63.3% of workers reporting fair/poor health status versus 47.1% reporting good/excellent; 56.9% of workers reporting moderate/severe pain versus 41.4% reporting mild/no pain; 64.7% of workers without health insurance versus 50.1% with health insurance; 69.0% of workers reporting depression versus 47.2% without depression; 70.4% of workers reporting obesity versus 48.0% without obesity; and 63.2% of workers often worried about expenses versus 46.9% reporting sometimes/never worried. Specific participation barriers were described by 34.2% of the 272 workers who were not interested. **Conclusions/applications to practice:** A majority of workers with work-related permanent impairments-particularly those with adverse health and economic characteristics-were interested in WWPs. Many workers who reported no interest cited participation barriers. Further research is needed to determine whether addressing such barriers would enhance equitable access. Those undertaking WWP planning, implementation, and outreach should ensure that WWPs are inclusive and serve workers with disabilities.

Shift Work

This month we explore shiftworkers' attitudes to shiftwork hours, and the association of shiftwork with pregnancy outcomes, and with depression, anxiety, and stress during the COVID-19 pandemic. Other shiftwork related issues include the effect of a mobile phone sleep self-management applications, the use of exogenous melatonin on shift work sleep disorders and the effects of a multimodal shift-work intervention on fatigue, sleep, health, and performance parameters.

Shiftworkers' attitude to their work hours, positive or negative, and why?

Background: Shift work is associated with impaired health and safety but there is a lack of systematic knowledge of shift workers attitude to their shift systems. This may be important for the ability to retain valuable personnel in the company/organization, and to attract new employees. The purpose of the

present study was to investigate: the prevalence of shift characteristics (nights, long shifts, short rest, etc.) in traditional shift systems, the workers' attitude to their shift systems, if combinations of problematic shift characteristics are associated with the workers' attitude, and if work stress and poor sleep, fatigue, or social difficulties are associated with attitudes to shift systems. **Methods:** A representative sample of 3,500 individuals with non-day work in the general population of Sweden were asked to participate in the study. A total of 1965 workers remained after drop-outs. The material was analyzed by Chi2 analysis and hierarchical multiple regression. **Results:** The results showed that traditional shift systems included many more shift characteristics than those constituting the core of the systems. All included day work, for example. 90.2% of those with roster work had shifts > 10 h at least once a month. 66.9% of those with roster work without nights had < 11 h rest between shifts at least once a month. Less than 25% of the respondents had a rather or very negative attitude to their shift system, with the lowest level for those who work either fixed days or nights (7.6 and 5.7%, respectively) and highest for three-shift work (21.2%) and roster work without night work (24.4%). Shiftwork or roster work with nights had highest levels (> 50%) of sleep problems and fatigue. The difference across shift systems was significant at p < .001 in all cases. Combinations of the most problematic shift characteristics were associated with some increase in negative attitude to the shift schedule. Among schedule characteristics, only long weeks turned out significant in the multivariable regression. The strongest predictor of negative attitude to work hours were social difficulties due to work schedule [ß = 4.98 (95% Confidence interval (Ci) = 3.41, 7.27; p < .001], fatigue caused by schedule (ß = 3.20 Ci = 2.03, 5.05; p < .001), sleep problems caused by schedule (ß = 2.10 Ci = 1.46, 3.01; p = .01), and stressful work (ß = 1.52 Ci = 1.10, 2.11; p < .05). **Conclusion:** It was concluded that shift systems often included many different shift characteristics, that night shift systems had a large proportion of long shifts, and that split shifts mainly occurred in roster day work. Furthermore, it was concluded that the attitude to the worker's present shift systems seems to be positive for the majority, with the highest level for those who work either fixed days or nights, compared to those who work alternating shifts (including night shifts). Negative attitude to shift systems was more linked to social difficulties, fatigue or sleep problems due to the shift schedule, than to schedule characteristics per se.

Shortening shift's length: Should we ask the residents if this is what they want?

Background: Work overload in hospitals enforced reducing shifts length of physicians in many countries over the last decade. In Israel, the current shift standard is of 26 hours, however, there is a residents' struggle alongside a governmental intent to short the shifts to 16 hour. We aim to evaluate residents and interns support and preferences regarding shortening shifts and their ramifications to quality of life and residency programs. **Methods:** A structured questionnaire was distributed to all resident and interns in a single center. We evaluated their current quality of residency and life, their support in the shorter shifts model, offering alternative program components such as reduced pay, longer residency or replacement in order to allow rest. We compared those who support the new model to those who objected to identify common characteristics to draw a resident profile for acceptance of change. **Results:** Overall, 151 physicians answer the questionnaire. 70.2% support the shorter shifts model. Residents above 35 years old and those reaching completion of residency, significantly less support the shortening shifts model. No other demographic nor professional parameters were different between the supporters and non-supporters. Option of reduced pay or longer residency dramatically reduced the support rate to less than 30% and 20%, respectively. Replacement by other physician (resident or senior physician) in order to allow rest was supported by only 40%. **Conclusion:** Residents' standpoints regarding a desirable change are crucial to plan a successful implementation. A national survey is required before a new model is introduced, to achieve an optimal transparent efficient process.

Shift work and sleep duration are associated with adverse pregnancy outcomes in a predominantly Latinx population with high rates of obesity

Background: Shift work has been associated with adverse pregnancy outcomes. The objective of this study was to evaluate the association between sleep disturbances and adverse pregnancy outcomes.
Methods and findings: This was a secondary analysis of a prospective study of participants enrolled in a prospective observational study wherein gravidae were screened for sleep apnea (2010-2012). A screening questionnaire with standard sleep apnea questionnaires as well as novel items about shift work and nocturnal sleep duration was administered at a prenatal care visit. Short sleep duration was defined as less than 7 hours. Prolonged sleep duration was defined as greater than 9 hours. In a cohort of 1125 pregnant people, 9.4% reported shift work at the time of screening. Gravidae who reported shift work were more likely than gravidae who reported no shift work to develop preeclampsia (28.3% versus 13.0%, P<0.001), preeclampsia with severe features (16.0% versus 8.5%, P = 0.010), gestational diabetes (28.3% versus 19.9%, P = 0.041), and a composite of adverse obstetric outcomes (61.3% versus 47.8%, P = 0.008). After adjusting for potentially confounding variables, shift work was associated with an increased risk for preeclampsia with (adjusted relative risk (aRR) 1.70, 95% CI 1.03-2.79, p = 0.036) and without (aRR 2.03, 95% CI 1.43-2.90, p<0.001) severe features, and gestational diabetes mellitus class A1 (aRR 1.47, 95% CI 1.05-2.05, p = 0.023) and class A2 (aRR 1.67, 95% CI 1.13-2.44, p = 0.009). Sleep duration was associated with gestational diabetes (31.3% among those with short sleep duration, 25.2% among those with normal sleep duration and 14.0% among those with prolonged sleep duration, P<0.001) and gestational diabetes class A2 (29.5%, 17.9%, and 10.1%, respectively, P<0.001). Gravidae with prolonged sleep duration experienced less composite adverse pregnancy outcomes at 42.6% compared to 57.4% for those with short sleep duration or 52.5% for those with normal sleep duration, P = 0.002. **Conclusions:** Shift work and sleep duration are both associated with adverse pregnancy outcomes. Further research on the impact of sleep disturbance on pregnancy outcomes is warranted.
Larson et al. 2022.
PLoS One, vol. 17, no. 8.

Exploring the associated factors of depression, anxiety, and stress among healthcare shift workers during the COVID-19 pandemic

Background: The recent pandemic of COVID-19 has had a tremendous impact on healthcare frontliners. This study sought to assess healthcare shift workers' depression, anxiety, and stress and its associated factors. **Methods:** The sampling frame includes healthcare shift workers directly managing COVID-19 cases around Klang Valley, Malaysia. The participants' mental health status was assessed using the Depression, Anxiety, Stress Scale-21 (DASS-21). The associated factors specified in this study include sleep quality, physical activities, and eating habits. Pearson's χ^2 and simple and multivariable binary logistic regression models were constructed following the Hosmer-Lemeshow approach to determine the potential associated factors. **Results:** A total of 413 participants were recruited. Overall, 40.7% of participants had one or more symptoms of depression, anxiety, or stress. Poor sleep quality was significantly associated with all mental health outcomes of depression, anxiety, and stress. Inactivity was found to be strongly associated with symptoms of depression and anxiety. At the same time, eating habits were strongly associated with anxiety and stress. **Conclusions:** Sleep quality, inactivity, and eating habits that were found to be associated with the mental health status of healthcare shift workers are modifiable factors that must be addressed to curb mental health issues among this group of workers.
Juliana et al. 2022.

Mobile phone sleep self-management applications for early start shift workers: A scoping review of the literature

Background: Poor sleep has significant impacts on both mental and physical well-being. This is especially the case for shift workers who rely on good sleep practices to manage the disruption caused by their working conditions. In recent years there has been a proliferation of sleep-focused mobile phone applications, some of which may be suitable for use by shift workers. There is limited evidence however, on whether these applications are sufficient in managing the sleep needs of the early start shift working population (i.e., those whose work schedules begin pre-dawn). **Methods:** This scoping review aims to identify and discuss peer-reviewed literature on mobile sleep applications used by early start shift workers for sleep-self management. Four databases (Scopus, EBSCOhost, CINAHL and PsycInfo) were searched for relevant literature using a pre-determined search string. **Results:** The initial search using the term *early start shift work* returned no papers, however a broadened search on shift work in general found 945 papers for title and abstract screening, of which 21 were deemed eligible for full text screening. Two of these papers met the inclusion criteria for this review. The results highlight, firstly, the paucity of research on the use of mobile phone applications for sleep self-management amongst early start shift workers, and secondly, the need for further research on the effectiveness of mobile applications for sleep self-management amongst shift workers in general. **Conclusions:** A working definition of early start shift work that can be used to stimulate research in this understudied population of shift workers is also proposed.

The effects of the exogenous melatonin on shift work sleep disorder in health personnel: A systematic review

Background: To know the medical documentation related to exogenous melatonin in sleep disorders caused by shift work in health personnel. **Methods**: Systematic and critical review. Data were obtained by looking up the bibliographic data base: MEDLINE (via Pubmed), Embase, Cochrane Library, Scopus, Web of Science, Latin American and Caribbean literature in Health Sciences (LILACS) and Medicine in Spanish (MEDES). The used terms, as descriptors and text in the title and abstract record fields, were "Health Personnel", "Melatonin" and "Sleep Disorders", Circadian Rhythm, by using the following filters: "Humans", "Adult: 19+ years" and "Clinical Trial". The search update was in December 2021. The documentary quality of the articles was assessed using the CONSORT questionnaire. **Results**: Having applied the inclusion and exclusion criteria, 10 clinical essays were selected out of 98 retrieved references. CONSORT scores ranged from a minimum of 6.0 to a maximum of 13. 7 with a median of 10.2. According to the SIGN criteria, this review presented "1-"evidence with a grade of recommendation B. The intervention dose via administration of exogenous melatonin ranged between 1 and 10 mg. It was not mentioned whether the route of administration was by fast or slow absorption. The outcomes showed decreased daytime sleepiness, lessened sleep onset latency, diminished night-time awakenings, increased total sleep period and improved daytime attention in the melatonin-treated group. **Conclusions**: Exogenously administered melatonin is effective in shift worker health personnel that are suffering from sleep disorders, and given its low adverse effects and tolerability, it might be recommended. A great disparity was evidenced in terms of dose, follow-up periods and type of melatonin, small participant population, same age ranges and young age. Therefore, new trials would be needed to amend these observations in order to have full evidence that is able to ensure the efficacy of exogenous melatonin in the studied population.

SHIFTPLAN: A randomized controlled trial investigating the effects of a multimodal shift-work intervention on drivers' fatigue, sleep, health, and performance parameters

Background: Shift work is commonly associated with health problems resulting from circadian misalignment and sleep restriction. About one in three shift workers is affected by insomnia and up to 90% report regular fatigue and/or sleepiness at the workplace. Epidemiological data shows that shift workers are at increased risk of cardiovascular disease, diabetes, obesity, breast cancer, mental-health problems, and shift-work disorder, which conditions typically lead to reduced work performance, processing errors, accidents at work, absenteeism, and reduced quality of life. Given these widespread and debilitating consequences, there is an urgent need for treatments that help improve the sleep, health, and functional performance of the shift-working population. The most common non-pharmacological recommendations are improved scheduling, bright-light exposure, napping, psychoeducation promoting sleep hygiene, and cognitive-behavioral techniques. The objectives of the present study are to investigate the effects of a multimodal shift-work intervention on perceived fatigue, sleepiness, physical and mental health, sleep parameters, and absenteeism. **Methods:** A randomized controlled interventional study comparing the two groups each comprising at least 80 drivers of a public transport company, using self-report questionnaires and health checks completed at intake and after 3 and 6 months following the start of the intervention or waiting-list period. The intervention consists of (a) healthy scheduling taking into account shift-rotation direction and speed, chronotype, resting time, and napping; (b) an education program specifically developed for shift workers; and (c) a dedicated information campaign for shift planners. The primary outcome is symptomatic burden in terms of sleepiness, and the key secondary outcome is symptomatic burden in terms of fatigue. Supplementary secondary outcomes are sleep parameters, absenteeism, general and clinical health, changes in mood, and anxiety. **Discussion:** Expected outcomes are significant improvements on all primary and secondary outcome parameters in the intervention group. To our knowledge, ours is the first randomized controlled study to systematically investigate the effects of a multimodal program on multiple health, sleep, and performance parameters in shift workers. Our research also aims at providing evidence-based practice guidelines for healthy scheduling in general and thus contribute to diminishing the serious health and economic burdens associated with shift work overall.

Work Ability

In this month's work ability studies, we explore work ability following a non-catastrophic road traffic injury, amongst young adult cancer patients, in workers with shoulder pain and amongst workers with visual impairment. We also explore the association between mobile work and work ability during the COVID-19 pandemic and the development of a prediction model for unemployment and work disability.

Factors associated with long term work incapacity following a non-catastrophic road traffic injury: Analysis of a two-year prospective cohort study

Background: Road traffic injuries (RTIs), primarily musculoskeletal in nature, are the leading cause of unintentional injury worldwide, incurring significant individual and societal burden. Investigation of a large representative cohort is needed to validate early identifiable predictors of long-term work incapacity post-RTI. Therefore, up until two years post-RTI we aimed to: evaluate absolute occurrence of return-to-work (RTW) and occurrence by injury compensation claimant status; evaluate early factors (e.g., biopsychosocial and injury-related) that influence RTW longitudinally; and identify factors potentially modifiable with intervention (e.g., psychological distress and pain). **Methods:** Prospective cohort study of 2019 adult participants, recruited within 28 days of a non-catastrophic RTI, predominantly of mild-to-moderate severity, in New South Wales, Australia. Biopsychosocial, injury, and compensation data were collected via telephone interview within one-month of injury (baseline). Work status was self-reported at baseline, 6-, 12-, and 24-months. Analyses were restricted to participants who reported paid work pre-injury (N = 1533). Type-3 global p-values were used to evaluate explanatory factors for returning to 'any' or 'full duties' paid work across factor subcategories. Modified Poisson regression modelling was used to evaluate factors associated with RTW with adjustment for potential covariates. **Results:** Only ~ 30% of people with RTI returned to full work duties within one-month post-injury, but the majority (76.7%) resumed full duties by 6-months. A significant portion of participants were working with modified duties (~ 10%) or not working at all (~ 10%) at 6-, 12-, and 24-months. Female sex, low education, low income, physically demanding occupations, pre-injury comorbidities, and high injury severity were negatively associated with RTW. Claiming injury compensation in the fault-based scheme operating at the time, and early identified post-injury pain and psychological distress, were key factors negatively associated with RTW up until two years post-injury. **Conclusions:** Long-term work incapacity was observed in 20% of people following RTI. Our findings have implications that suggest review of the design of injury compensation schemes and processes, early identification of those at risk of delayed RTW using validated pain and psychological health assessment tools, and improved interventions to address risks, may facilitate sustainable RTW.

Association between mobile work and work ability: A longitudinal study under the impact of the COVID-19 pandemic

Background: This study examines the effect of mobile work on work ability as direct predictor and as factor moderating workplace stressors and resources. Originally, the study focused on the effects of mobile work on work ability in a mobile test group compared to office workers. As the study period of 1 year collided with the beginning of the COVID-19 pandemic and lockdown restrictions, we can now explore the association of mobile work and work ability before and during the first year of the COVID-19 pandemic. **Methods:** This longitudinal, exploratory study took place in a medium-sized company in the social insurance sector in Germany. We used a mixed-methods design (online survey and focus group interviews) with two survey dates 1 year apart (T0: summer/autumn 2019 (before COVID-19 pandemic), T1: summer 2020 (during COVID-19 pandemic, after first strict lockdown)). Quantitative data, which are reported here, were collected by means of an online questionnaire, which includes questions on mobile work and validated measures for work-related stressors and resources and work ability. Non-parametric tests, regression analysis, and logistic regression models were used for data analysis. **Results:** The linked data set of both survey dates includes N = 102 persons (men: 37%, mean age: 41-50 years). Interestingly, we found an improvement in work ability over the course of the study (p = 0.007), although it included the first and most drastic COVID-19 restrictions in Germany. Before the pandemic, correlations between work ability and work-related stressors (e.g., work-privacy conflicts) and resources (e.g., sense of community) were evident. Some of these factors are moderated by mobile work. During the COVID-19 pandemic, mobile work was identified as independent factor for work ability. In addition, technology competence conviction gained importance as a personal resource in our cohort. **Conclusions:** Work ability can be influenced by many factors. Our study, which allowed for a comparison of work ability before and during COVID-19

pandemic, suggests that mobile work can be especially helpful to maintain work ability in times of change. Our findings support the notion that-under normal conditions-mobile work can influence work ability via work-related stressors and resources. In times of changes, it can have an independent effect on work ability. It must be assumed that the effects can be highly individual or context-specific.

Work ability and cognitive impairments in young adult cancer patients: Associated factors and changes over time-results from the AYA-Leipzig study

Background: Although young adults represent a significant portion of the working population, little is known about the work ability and cognitive impairments in adolescent and young adult (AYA) cancer patients (including the long-term course) following cancer treatment. **Methods:** As part of the AYA-Leipzig study, we surveyed AYA cancer survivors (aged 18-39 years at diagnosis; time since diagnosis ≤ 4 years, including all cancer diagnoses) at two time points (t2 = 12 months after t1). Work ability (Work Ability Index, WAI-r) and cognitive impairments (Copenhagen Psychosocial Questionnaire, COPSOQ) were compared at both time points. We analysed predictors for work ability at, on average, 2 years post cancer diagnosis (t2) by using multivariate regression analyses. **Results:** A total of 502 patients (74.7% women) participated in both measurements. Mean work ability increased significantly from t1 (6.0; SD = 2.3) to t2 (6.8; SD = 2.2) (t = -9.3; p < 0.001). As many as 380 (76%) AYA cancer survivors reported reduced work ability at t1; 1 year later, this still applied to 287 (57%) of them. Decreased work ability (t2) was associated with more cognitive impairment, higher effort coping with the disease, comorbidities, sick leave > 6 months (since diagnosis), and having children (adj R^2 = .48). Cognitive impairments occurred in approximately every fifth patient at both surveys. **Conclusions:** Achieving maximum work ability is a major challenge for AYAs. Our results show the need for multimodal cancer survivorship and rehabilitation programmes with a special focus on improving cognitive and psychosocial functioning. **Implications for cancer survivors:** AYAs with cancer should receive targeted occupational counselling early in the course of the disease.

Factors associated with limitations in daily life and at work in a population with shoulder pain

Background: Shoulder pain, which is a widespread condition, can lead to participation restrictions in daily and professional life. However, there are few studies focusing on the differences between daily life limitations and work limitations. This study aims at identifying the factors associated with limitations in personal and professional life in a population of working age suffering from shoulder pain. **Methods**: A sample of working age job seekers and workers with shoulder pain was drawn from the last general population cross-sectional French study on disability. Limitations were categorized depending on whether they related to daily life and/or work. The variables assessed were age, sex, state of health, activity restrictions, need for accommodation, and aggravating living conditions or aggravating working conditions. Separate Quasi-Poisson regressions were performed for each type of limitation. **Results**: The sample consisted of 795 individuals of which 33.7% had no limitation, 21.7% were limited in daily life, 6.0% at work, and 38.6% in both. Factors significantly associated with daily life limitations and work limitations and their computed Prevalence Ratios (PR) were the need for accommodation (PR = 2.16), activity restrictions (PR = 2.28), perceived poor health (PR = 2.42) and low income (PR = 1.64). Aggravating living conditions and aggravating working conditions were associated with daily life limitations (PR of 1.69 and 0.63 respectively).

Conclusions: The present study identifies factors associated with disability in a population with shoulder pain. Further research should be carried out in order to study health-related periods of cessation of work.

Effect of the age of visual impairment onset on employment outcomes in South Korea: Analysis of the national survey on persons with disabilities data

Background: Opportunities for paid employment provide meaningful ways for those with disabilities to participate in society and achieve financial independence. Although the onset age of disabilities can alter individuals' attitudes toward accepting their disabilities and their desire for work, the lack of data limits relevant empirical research. The purpose of this study is to examine the effect of the onset age on employment, job security (permanent vs. temporary), and wage level among visually impaired adults in South Korea. **Methods:** We used three years of the National Survey on Persons with Disabilities data, 2011, 2014, and 2017, and included 583 participants in this study. We used a logistic regression model for the employment status and a multinomial logistic regression model for job security. We analyzed log monthly wage by a multivariate linear regression model, which subdivided the age groups, with 20-49 years old denoting prime-aged (n = 245) and 50-64 years old denoting late-middle-aged (n = 338). For each age group, we conducted a sub-analysis by sex. **Results:** For prime-aged adults, the employment probability decreased as the age of visual impartment onset increased, and women in particular experienced a lower employment rate for both permanent and temporary jobs when their disability onset age was above 25. However, among permanent employees, monthly wages were higher if the onset age was 25 + compared to when the onset age was 0-5 years old. In late middle-aged adults, adult onset disabilities were associated with higher odds of employment and higher wages for temporary jobs, implying these individuals worked unskilled or manual jobs. **Conclusions:** In prime-aged adults, higher monthly wages among permanent employees showed that they were more likely to continue their original work, whereas in late-middle-aged adults, adult-onset disabilities were associated with a higher employment rate and higher wages for temporary jobs, suggesting the need for further investigation into job quality. These findings indicate a need for differentiated policy approaches considering the onset age of visual impairment to improve labor market outcomes throughout individuals' lifespans.

Development and validation of a prediction model for unemployment and work disability among 55,950 Dutch workers

Background: This study developed prediction models for involuntary exit from paid employment through unemployment and disability benefits and examined if predictors and discriminative ability of these models differ between five common chronic diseases. **Methods:** Data from workers in the Lifelines Cohort Study (n = 55 950) were enriched with monthly information on employment status from Statistics Netherlands. Potential predictors included sociodemographic factors, chronic diseases, unhealthy behaviours and working conditions. Data were analyzed using cause-specific Cox regression analyses. Models were evaluated with the C-index and the positive and negative predictive values (PPV and NPV, respectively). The developed models were externally validated using data from the Study on Transitions in Employment, Ability and Motivation. **Results:** Being female, low education, depression, smoking, obesity, low development possibilities and low social support were predictors of unemployment and disability. Low meaning of work and low physical activity increased the risk for unemployment, while all chronic diseases

increased the risk of disability benefits. The discriminative ability of the models of the development and validation cohort were low for unemployment (c = 0.62; c = 0.60) and disability benefits (c = 0.68; c = 0.75). After stratification for specific chronic diseases, the discriminative ability of models predicting disability benefits improved for cardiovascular disease (c = 0.81), chronic obstructive pulmonary disease (c = 0.74) and diabetes mellitus type 2 (c = 0.74). The PPV was low while the NPV was high for all models.
Conclusion: Taking workers' particular disease into account may contribute to an improved prediction of disability benefits, yet risk factors are better examined at the population level rather than at the individual level.

Adapting to the Future of Work

Aging Workforce

This month we explore the effect of work changes on aging workers' ability to cope, their wellbeing and employment transitions, and weight change.

Work changes and employee age, maladaptive coping expectations, and well-being: A Swedish cohort study
Background: Older workers are expected to suffer more from work changes than younger ones, but empirical evidence is lacking. Negative responses to work changes may result rather from maladaptive coping expectations. This study examined possible age differences in job and life satisfaction, and sleep disturbances, after work changes (voluntary and involuntary job changes, reorganizations) and the moderating role of maladaptive coping expectations. **Methods:** Four biennial waves from the Swedish Longitudinal Occupational Survey of Health (SLOSH) including respondents who participated in all four waves (n = 3084). We used multilevel path analyses to estimate direct and moderated relationships between work changes and outcomes. **Results:** Involuntary job changes were associated with lower job and life satisfaction and more sleep disturbances. Reorganizations were only associated with lower job satisfaction. Older employees were more satisfied with their jobs and lives than younger employees and experienced more sleep disturbances. After involuntary job changes, older employees had similar (lower) levels of well-being as younger ones, but they reported more sleep disturbances when having experienced reorganizations. Maladaptive coping expectations were related to lower job and life satisfaction and more sleep disturbances. Employees with maladaptive coping expectations reported more sleep disturbances after involuntary job changes and reorganizations. **Conclusion:** Our results suggest that there are few age differences in well-being after work changes. Employee well-being seems to mostly depend on maladaptive coping expectations. Organizations aiming to prepare employees for job changes and reorganizations could focus their efforts on employees with maladaptive expectations rather than on older ones.

A systematic review of evidence on employment transitions and weight change by gender in ageing populations

Background: Becoming unemployed is associated with poorer health, including weight gain. Middle- and older-age adults are a growing segment of workforces globally, but they are also more vulnerable to changes to employment status, especially during economic shocks. Expected workforce exits over the next decade may exacerbate both the obesity epidemic and the economic burden of obesity. This review extends current knowledge on economic correlates of health to assess whether employment transitions impact body weight by sex/gender among middle-aged and older adults. **Methods:** Eight bibliometric databases were searched between June and July 2021, supplemented by hand-searches, with no restriction on publication date or country. Longitudinal studies, or reviews, were eligible when examining body weight as a function of employment status change in adults ≥50 years. Data extraction and quality appraisal used predefined criteria; reported findings were analysed by narrative synthesis. **Results:** We screened 6,001 unique abstracts and identified 12 articles that met inclusion criteria. All studies examined retirement; of which two also examined job-loss. Overall, studies showed that retirement led to weight gain or no difference in weight change compared to non-retirees; however, reported effects were not consistent for either women or men across studies or for both women and men within a study. Reported effects also differed by occupation: weight gain was more commonly observed among retirees from physical occupations but not among retirees from sedentary occupations. Few studies assessed the role of health behaviours; sleep was the least studied. Most studies were medium quality. **Conclusions:** Existing studies do not provide a clear enough picture of how employment transitions affect body weight. Firm conclusions on the impact of employment transitions on weight cannot be made without further high-quality evidence that considers the role of gender, job-type, other health behaviours, and other transitions, like job-loss.
Tam et al. 2022.

Guiding and Supporting Mental Health and Wellbeing

Mental Health

This month we explore the issues associated with mental health and workplace factors during Covid-19 in front line workers, health care workers and occupational safety and health/human resource professionals. In non-Covid-19 related research the prevalence of PTSD and sleep quality in fire rescue workers is also explored.

Addressing mental health factors to improve outcomes in work-related COVID-19: A retrospective study of frontline workers

Background: This retrospective study investigated the benefits of adding psychological services for frontline workers with delayed recovery from COVID-19 due to psychosocial stressors and/or mental disorders. **Methods:** Both standardized psychological evaluation and at least 3 sessions of work-focused cognitive behavioral therapy were provided to 103 participants. Benefits were assessed by comparing the pretreatment and posttreatment recovery, work status, and self-ratings of work-related and adaptive daily functioning. **Results:** Duration of recovery and return to work were reduced along with improvements in work relevant (40%) and adaptive functioning (31%). The majority (80%) returned to work within 12 weeks despite variable presenting problems, course of illness, demographic, and job factors. **Conclusions:** Brief work-focused cognitive behavioral therapy seems to be an effective adjunct to customary outpatient medical care for COVID-19 in frontline essential workers for whom the return-to-work process may be negatively affected by stress, anxiety, and depressed mood.
LeGoff et al. 2022.

Keywords: Mental health; COVID-19; frontline workers.
Evidence Level: 4B
Link:

Association between workplace and mental health and its mechanisms during COVID-19 pandemic: A cross-sectional, population-based, multi-country study

Background: The COVID-19 pandemic worsens populations' mental health. However, little is known about the COVID-19-related mental health among remote workers. **Methods:** We retrieved data from survey of Health, Ageing and Retirement in Europe, covering 27 countries. Eligible people were those employed. The main outcome is the mental disorder, covering four aspects: depression, anxiety, sleep disorder, and loneliness. Country-specific weighted mixed models were fitted to estimate the association of workplaces with mental health, controlled for age, gender, education level, living alone, making ends meets, working hours, closing to suspected or confirmed COVID-19 cases, received anti-virus protection, social contact, disability, and chronic disease. Moderate analyses were conducted to explore possible mechanisms.
Results: 11,197 participants were included, among them 29.3% suffered at least one worse mental disorder. After controlling for covariates, compared with those who worked at the usual workplace, those who worked at home only or part of the time did not associate with worse mental disorders (p-value ≥0.1395), and those who worked at neither the usual workplace nor home had a 55% higher likelihood of suffering from worse mental disorders (OR = 1.55, 95%CI 1.03-2.36). The mediation analyses identified three indirect pathways by which workplaces influence mental health, including making ends meets, social contact, and receiving anti-virus protection. Detailed results on subtypes of mental disorders were also provided. **Limitations:** All assessments were self-reported, resulting in a risk of method bias.
Conclusions: During the COVID-19 pandemic, working at other places, neither at the usual workplace nor home, worsened mental health. Evidence provided in this study will contribute to more nuanced and practical public health policy strategy making.
Zhang et al. 2022.

Subjective COVID-19-related work factors predict stress, burnout, and depression among healthcare workers during the COVID-19 pandemic but not objective factors

Background: Work-related stress is significantly higher among healthcare workers (HCWs) than in the general population. Elevated occupational stress has been linked to burnout syndrome and depression. Moreover, medical professionals working during infectious disease outbreaks are at especially high risk for these problems. The aim of the present study was to examine the mental health status of HCWs and possible predictors of mental health status related to the COVID-19 outbreak utilizing a complex comprehensive model. **Methods:** In a countrywide cross-sectional survey among HCWs (N = 2087), work-related stress, COVID-19 -related objective work factors (displacement, frontline working) and subjective work factors (insecurity, unpredictability, workload), perceived stress, work-related stress, burnout and depression were assessed between the second and third wave of COVID-19 pandemic in Hungary.
Results: COVID-19-related objective factors did not predict directly stress, burnout, and depression, whereas feelings of insecurity and unpredictability in relation to the COVID-19 situation at work had a significant medium-sized total effect (also considering the indirect effect via stress) on burnout and depression. **Conclusions:** In order to prevent subsequent mental health problems during crisis situations, such as the COVID-19 pandemic, healthcare management should create a more predictable work environment and a safer work experience for healthcare workers and provide mental health support.
Spányik et al. 2022.

How did work-related depression, anxiety, and stress hamper healthcare employee performance during COVID-19? The mediating role of job burnout and mental health

Background: The study objective was to examine the psychological impact of the COVID-19 pandemic on the performance of healthcare employees. **Methods:** The study was informed by a theoretical framework that incorporates different psychological issues (i.e., stress, depression, and anxiety) that influence healthcare workers' performance through the mediating roles of job burnout and mental health. The study data was gathered through structured questionnaires from 669 participants working in the healthcare sector in Pakistan. A structured equation modeling (SEM) technique was used for data analysis and hypothesis development. **Results:** It was found that stress, depression, and anxiety positively affected healthcare employees' job performance during COVID-19. Psychological factors had a positive and significant impact on job burnout and mental health. Job burnout and mental health mediated the relationship between stress, anxiety, depression, and employee performance. The ongoing repercussions of COVID-19 include their impact on employee performance in the healthcare sector. Healthcare worker performance is critical to fostering industrial economic growth. Elevated levels of stress, depression, and anxiety have profoundly exacerbated employee mental health issues. **Conclusions:** COVID-19 has created challenging working conditions in organizations requiring that they address the growing psychological issues which impact negatively on worker performance.

The relationship between burnout and intention to leave work among midwives: The long-lasting impacts of COVID-19

Background: It is important to evaluate the long-term effects of the COVID-19 pandemic on the intention of midwives to leave their jobs. The study examined the relationship between burnout and the intent to leave work among midwives who worked at Ayatollah Mousavi Hospital of Zanjan, one year after the COVID-19 outbreak. **Method:** In a descriptive-analytical study, the intention of 88 midwives to leave their jobs was evaluated, one year after the outbreak of COVID-19 disease in 2021. The midwives were selected using convenience sampling methods. Data were collected using the Maslach burnout questionnaire and the Anticipated Turnover Scale (ATS). Data were analyzed with descriptive statistics, Chi-square test, Pearson correlation coefficient, and multiple linear regression model with the stepwise method at a 95% confidence level. **Results:** The mean intention to leave the job was 29.71 ± 6.75. Most of the midwives reported a moderate level of intention to leave the job (47.7%). There was a significant positive correlation between the intention to leave the job and all three components of burnout. The stepwise regression analyses indicated that emotional exhaustion ($\beta = 0.344$) and working rotational shifts ($\beta = 0.276$) were significant predictors of intent to leave the job. **Conclusions:** It can be concluded that the intention to leave the job of midwives was moderate. Given the relationship between emotional exhaustion and the intent to leave the job, interventions to increase the mental strength and resilience of midwives during the COVID-19 pandemic seem necessary.

Post-traumatic stress disorder prevalence and sleep quality in fire victims and rescue workers in southern Brazil: a cross-sectional study

Background: This survey was conducted to evaluate the prevalence of post-traumatic stress disorder (PTSD) and the sleep quality in victims and rescue team of the third deadliest nightclub fire in the world. **Study design:** A cross-sectional study. **Methods:** Participants were victims and rescue workers exposed to a fire at a nightclub, which occurred in January 2013 in Southern Brazil. The Pittsburgh Sleep Quality Index (PSQI), composed of seven subjective sleep variables (including daytime dysfunction), and PTSD Checklist - Civilian version (PCL-C) were applied to all people who sought medical attention at the local reference center in the first year after the event. Comprehensive information was obtained concerning sociodemographic factors, health status, and sleep complaints. **Results:** A total of 370 individuals, 190 victims and 180 rescue workers, were included. Participants were 70% male, with an average age of 29 years. The prevalence of PTSD was 31.9%, ranging from 24.4% for rescue workers to 38.9% for victims. The prevalence of poor sleep quality was 65.9%, ranging from 56.1% for rescue workers to 75.3% for victims. Most of the participants with PTSD (91.5%) had PSQI scores >5 (poor sleepers), against 54.0% of the non-PTSD individuals. All seven PSQI subscores showed significant differences between PTSD and non-PTSD individuals, especially daytime dysfunction. Sex, shift work, previous psychiatric disease, and sleep quality remained associated with PTSD in adjusted models, with a prevalence ratio (95% CI) of 1.76 (1.28-2.43) in females, 1.73 (1.17-2.55) in shift workers, 1.36 (1.03-1.80) in individuals with psychiatric disease history, and 5.42 (2.55-11.52) in poor sleepers. **Conclusions:** The presence of daytime dysfunction increased by at least tenfold the prevalence of PTSD in this sample. Considering that daytime dysfunction was shown to be strongly associated with PTSD, sleep-related issues should be addressed in the assessment of individuals exposed to traumatic events, both victims and rescuers. Factors like shift work and female sex were also associated with PTSD, especially among victims.

Bertolazi et al. 2022.

Public Health, vol. 209.

Keywords: Nightclub fire; PTSD; post-traumatic stress; rescue workers; sleep quality; victims.

Evidence Level: 4B

Employee mental health during COVID-19 adaptation: Observations of occupational safety and health/human resource professionals in Ireland

Background: This study aims to understand mental health issues among Irish employees arising from COVID-19 adaptation from the perspective of Occupational Safety and Health (OSH) and/or Human Resource (HR) professionals. **Methods:** Fifteen focus groups including 60 OSH/HR professionals from various sectors were conducted covering four predetermined themes. The data were transcribed verbatim, with transcripts entered into Nvivo for thematic analysis incorporating intercoder reliability testing. **Results:** The mental health impacts among employees are identified from three stages: pre-adaptation, during adaptation, and post-adaptation. Most issues were reported during the second stage when working conditions dramatically changed to follow emerging COVID-19 policies. The identified mental health support from participating organizations included providing timely and reliable information, Employee Assistance Programme (EAP), informal communication channels, hybrid work schedules and reinforcement of control measures. **Conclusion:** This study explores the challenges facing employees during the different stages of COVID-19 adaptation and the associated mental health impacts. Gender's influence on mental health consultations should be considered when planning for public health emergencies, and further research conducted in male dominated industries.

Chen et al. 2022.

International Journal of Public Health, vol. 9, no. 67.

Keywords: COVID-19; employee wellbeing; fatigue; mental health; occupational health; work adaptation.

Bullying and Harassment

Model policies to protect U.S Fire-based EMS responders from workplace stress and violence
Background: The stress and violence to fire-based emergency medical service responders (SAVER) Systems-Level Checklist is an organizational-level intervention to address stress and violence in emergency medical service (EMS), focused on the development of policy and training. Fire and EMS leadership, first responders, dispatchers, and labor union representatives participated in the SAVER Model Policy Collaborative to develop model policies that resulted from the most feasible checklist items. **Methods**: ThinkLets technology was employed to achieve consensus on the model policies, and an Action SWOT analysis was then conducted to assess facilitators and barriers to policy implementation. **Results:** The resultant model policies are a systems-level workplace violence intervention for the U.S. fire and rescue service that is ready for implementation. Expected improvements to organizational outcomes such as burnout, job engagement, and job satisfaction are anticipated, as are decreasing assaults and injuries. **Conclusions:** The SAVER Model Policies have the potential to inform national standards and regulations on workplace violence in EMS.
Taylor et al. 2022.
New Solutions, vol. 32, no. 2.

Psychosocial Issues

In this month's studies we explore psychosocial issues associated with job satisfaction, job performance and burnout, the relationship between cardiovascular diseases and depression and psychosocial work exposures, the effect of workplace trauma on work, health and family relationships, and the relationship between job stress factors caused by gender ratio imbalance in a workplace. In Covid-19 related research, we explore the impact of COVID-19 pandemic perceptions on job stress.

How workplace social capital affects turnover intention: The mediating role of job satisfaction and burnout
Background: Committed social workers are significant to organizational performance and service quality; therefore, it is crucial to explore the contributing factors of turnover intention to enhance social workers' commitment. **Methods**: To reduce social workers' turnover intention, this study used the first national survey data (N = 5620) of social workers in China to find out the relationship between workplace social capital and turnover intention in public service and explore possible solutions. This study treated workplace social capital as a comprehensive measure that captured employees' overall perceptions of their interpersonal relations in the public sector. It covered the impact of many other organizational factors on turnover intention, such as job embeddedness, social networks, social relations, communication, and organizational fairness. **Results:** The results confirmed that workplace social capital had a significant negative impact on employees' turnover intention. Workplace social capital could be a better predictor of employees' turnover intention than a single organizational factor or a combination of several factors. These findings not only deepened the theoretical understanding of social capital within the organization and brought insight into how workplace social capital affected employees' turnover but also promoted a formation of a holistic organizational perspective from the fragmented organizational factors. Results also showed that job burnout and job satisfaction mediated the relation between workplace social capital and turnover intention. **Conclusions:** Public service agencies should endeavor to foster an organizational

climate of cooperation and trust, encourage teamwork and altruistic behaviors among coworkers to reduce emotional exhaustion, and strengthen the professional identity and professional value of social work.

Burden of cardiovascular diseases and depression attributable to psychosocial work exposures in 28 European countries

Background: This study aimed to estimate the annual burden of cardiovascular diseases and depression attributable to five psychosocial work exposures in 28 European Union countries (EU28) in 2015. **Methods**: Based on available attributable fraction estimates, the study covered five exposures, job strain, effort-reward imbalance, job insecurity, long working hours and workplace bullying; and five outcomes, coronary/ischemic heart diseases (CHD), stroke, atrial fibrillation, peripheral artery disease and depression. We estimated the burden attributable to each exposure separately and all exposures together. We calculated Disability-Adjusted Life Years (DALY) rate per 100 000 workers in each country for each outcome attributable to each exposure and tested the differences between countries and between genders using the Wald test. **Results**: The overall burden of CHD attributable to the five studied psychosocial work exposures together was estimated at 173 629 DALYs for men and 39 238 for women, 5092 deaths for men and 1098 for women in EU28 in 2015. The overall burden of depression was estimated at 528 549 DALYs for men and 344 151 for women (respectively 7862 and 1823 deaths). The three highest burdens in DALYs in EU28 in 2015 were found for depression attributable to job strain (546 502 DALYs), job insecurity (294 680 DALYs) and workplace bullying (276 337 DALYs). Significant differences between countries were observed for DALY rates per 100 000 workers. **Conclusions**: Such results are necessary as decision tools for decision-makers (governments, employers and trade unions) when defining public health priorities and work stress preventive strategies in Europe.

Repercussions on work, health and family relationships of police officers wounded by gunshot to the face

Background: This article aims to identify the profile of police officers who underwent surgery due to gunshot wounds to the face, to survey the anatomical distribution of injuries and the repercussions on their health, work and family relationships. **Methods:** We conducted a retrospective epidemiological study based on secondary data of police officers who underwent surgery at the Central Military Police Hospital of the state of Rio de Janeiro due to gunshot wounds to the face from June 2003 to December 2020 (N=87). We also adopted a qualitative approach by applying a questionnaire with open and closed questions (N=37) to survey repercussions of the violent event on police officers' work, families and health. **Results:** The profile of police officers who underwent surgery showed that they were exclusively males, aged 34.9 years on average, privates, and injured in the line of duty. Fractures of the mandibular region were the most frequent injuries. After the accident, physical health conditions of police officers deteriorated, including an increase in cases of hypertension, a high frequency of insomnia (59.4%), and headache (51.3%).
Conclusions: Damaged family relationship included an increasing trend of self-isolation and a feeling of fear experienced by police officers' family members.

The relationships of psychological capital and influence regulation with job satisfaction and job performance

Background and aims: The individual difference predictors of positive work attitudes and behaviors have been widely investigated in the field of positive organizational scholarship. However, to date, integrating studies linking positive psychological resources, such as Psychological Capital and influence regulation, with positive organizational outcomes are still scarce. Thus, the main aim of the present study was to examine the relationships of Psychological Capital and influence regulation with job satisfaction and job performance both at the individual and team levels. **Methods:** Within the cross-sectional multi-source research involving both team leaders and team members from 34 different teams, we examined the relationships of Psychological Capital and influence regulation with job satisfaction and job performance. The relationships of the study variables were based on the positive organizational behavior and the broaden-and-build theory of positive emotions, which suggest the positive relationships of distinct positive psychological resources with positive work outcomes. Accordingly, in addition to the widely accepted concept of Psychological Capital (PsyCap), we employed and analyzed the complimentary construct of influence regulation (i.e., the ability to intentionally share social influence with others in the workplace) both at the individual and group levels. **Results:** The results of hierarchical linear modeling with 304 individuals from 34 teams from a diverse sample of Polish employees indicated that team members' PsyCap was positively linked to individual-level job satisfaction and two facets of job performance, i.e. creative performance and in-role performance. In contrast, no relationship was found between influence regulation and job satisfaction or job performance at both levels of analysis. **Conclusion:** With regard to positive interpersonal resources, the findings highlight the role of PsyCap in predicting job satisfaction and job performance and broaden the understanding of positivity in the workplace by introducing the construct of influence regulation. Also, based on the study results, managerial implications are discussed.
Paliga et al. 2022.

A study on job stress factors caused by gender ratio imbalance in a female-dominated workplace: Focusing on male airline flight attendants

Background: This study investigated the factors that cause job stress among male flight attendants in a female-dominated airline organization, as well as the impact of job stress on their mental health and turnover intention. It also attempted to determine whether perceived family support, perceived organizational support, and job positions had moderating effects on male flight attendants' job stress.
Methods and Results: Six job stress factors were identified through focus group interviews and a literature review. A survey was conducted from 1 January to 2 February 2022 to validate the research model, and 188 valid samples were used for statistical analysis. This study discovered that gender differences in communication, relationship conflict with colleagues, hierarchical organizational culture, and role overload had a direct impact on male flight attendants' job stress. Job stress was found to have a negative impact on mental health and a positive impact on turnover intention. Perceived organizational support was also found to reduce job stress. **Conclusions and Implications:** This study is notably the first to address stress encountered by male flight attendants at work. It offers new directions for future airline personnel management and research. It also presents practical implications, such as the development of training and personnel management programs for male flight attendants.
Lee et al. 2022.

Keywords: Gender differences; gender role conflict; hierarchical organizational culture; job position; job stress; male flight attendants; mental health; perceived family support.
Evidence Level: 5A
Link: https://www.mdpi.com/1660-4601/19/15/9418

Impact of COVID-19 pandemic perception on job stress of construction workers
Background: Construction has been regarded as one of the most stressful industries, and the COVID-19 pandemic has deteriorated this situation. **Methods:** This research developed and tested a model of the impact of COVID-19 pandemic perception on job stress of construction workers. Both problem-focused and emotion-focused coping were considered as mediators. Empirical data were collected using a detailed questionnaire from the Chinese construction industry. **Results:** The results showed that pandemic perception was significantly related to psychological and physical stress. Emotion-focused coping was mainly triggered by pandemic fear and job insecurity, while problem-focused coping was mainly triggered by organizational pandemic response. **Conclusion:** Furthermore, the effects of pandemic fear and organizational pandemic response on job stress were mediated by problem-focused coping. Finally, the theoretical and practical significance, research limitations, and future research directions of this study are discussed.
Liang et al. 2022.
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Keywords: COVID-19; construction workers; emotion-focused coping; job stress; pandemic perception; problem-focused coping.
Evidence Level: 5B
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Enabling Healthy and Safe Workplaces

Health and Wellbeing

This month we the prevalence of seasickness among seamen, the use of smart hand sanitisers in the workplaces, and the development of the NIOSH Worker Well-Being Questionnaire. In Covid-19 related research, we explore the effects of lockdown on metabolic syndrome.

Effects of coronavirus disease 2019 lockdown on metabolic syndrome and its components among Chinese employees: A retrospective cohort study
Background: Coronavirus disease 2019 (COVID-19) and the accompanying isolation have changed resident life rhythms and behaviors. This study investigated the effects of the COVID-19 pandemic on metabolic syndrome (MetS) and its components in employees in southwestern China. **Methods:** This retrospective cohort study included 3,777 employees of five institutions who underwent physical examinations at the Affiliated Hospital of Southwest Medical University for three consecutive years from 2018 to 2020. We collected data on participant age and sex and measured the component indices of metabolic syndrome, including waist circumference, blood pressure (systolic and diastolic), fasting blood glucose level, and blood lipid (triglyceride and high-density lipoprotein cholesterol) level. We applied t-, chi-square, Mann-Whitney U, and Friedman's M tests to compare metabolic variables at different times. **Results:** The incidence of MetS in 2020 was 18.6%, significantly higher than the prevalence of 15.7% before the epidemic. The number of abnormal MetS components following the COVID-19 lockdown was much greater than those in 2018 ($P < 0.001$) and 2019 ($P < 0.001$), with no significant variations between the two years ($P = 0.142$). All metabolic parameters, except for fasting blood glucose, were significantly worse than those pre-lockdown. The increase in the prevalence of MetS and all its abnormal components except for fasting glucose from 2019 to 2020 was significantly higher than that from 2018 to 2019. The change values between 2019-2020 and 2018-2019 for all indices except for diastolic blood pressure did not differ significantly between men and women. For all component indicators except for waist circumference, we observed no significant age

differences in the growth differentials between the two periods (2019-2020 and 2018-2019).
Conclusions: COVD-19 lockdown have increased metabolic health risks among Chinese adults. Targeted measures, such as health education, are urgently needed to address poor metabolic health caused by the COVID-19 pandemic.

Occupations and their impact on the spreading of COVID-19 in urban communities
Background: The current pandemic has disproportionally affected the workforce. **Methods:** To improve our understanding of the role that occupations play in the transmission of COVID-19, we analyse real-world network data that were collected in Bucharest between August 1st and October 31st 2020. The data record sex, age, and occupation of 6895 patients and the 13,272 people they have interacted with, thus providing a social network from an urban setting through which COVID-19 has spread. **Results**: Quite remarkably, we find that medical occupations have no significant effect on the spread of the virus. Instead, we find common transmission chains to start with infected individuals who hold jobs in the private sector and are connected with non-active alters, such as spouses, siblings, or elderly relatives. We use relational hyperevent models to assess the most likely homophily and network effects in the community transmission. We detect homophily with respect to age and anti-homophily with respect to sex and employability. **Conclusions:** We note that, although additional data would be welcomed to perform more in-depth network analyses, our findings may help public authorities better target under-performing vaccination campaigns.

Smart hand sanitisers in the workplace: A survey of attitudes towards an internet of things technology
Background and Methods: An online survey was circulated to employees from a wide range of organisations to gauge attitudes towards the idea of using smart hand sanitisers in the workplace. The sanitisers are capable of real-time monitoring and providing feedback that varies according to the hand hygiene behaviour of users. In certain circumstances, the sanitisers can monitor individuals, making it possible to identify workers whose hand hygiene falls below a certain standard. **Results**: The survey was circulated between July and August 2021 during the COVID-19 pandemic. Data gathered from 314 respondents indicated support for some features of the technology, but also indicated concern about invasions of privacy and the possibility of coercion. Attitudes towards the possible implementation of the technology varied significantly according to certain characteristics of the sample, but particularly with age. Respondents above the median age were more likely to support the use of data in ways that could facilitate the promotion and enforcement of hand hygiene practices.

Workers' health policies in Brazil: Historical contradictions and possibilities for development
Background: The Workers' Health (WH) approach understands that it is necessary to expand the object of public policies to transform the work processes that determine the health-disease relationship. This broadening brings challenges that drive the development of the formulation and implementation of policies for the surveillance and prevention of diseases. **Methods:** This article aimed to analyze the development of Brazilian policies on WH from the perspective of historical contradictions. To this end, the analytical concept of contradiction from Cultural-Historical Activity Theory was used. This is a scoping review, including 64 theoretical and empirical studies and gray literature published between 1991 and 2019. **Results:** The results of the analysis showed that: from the change of the object of prevention inserted by the WH approach, five new contradictions emerged that are related to the predominance of instruments of the previous activity model, normative and training instruments, division of labor for assistance and surveillance actions, intra and intersectoral articulations. and social control. These contradictions have driven some changes, but some limitations persist around a challenging object.

Seasickness among Icelandic seamen
Background: The working environment abroad a ship is unique, with constant stimuli such as rolling of the vessel, noise, and vibration. Fishing industry is important for Icelandic economy, still the effect of seasickness-related symptoms on seamen´s health is not fully understood. Thus, the objective of this study is to explore the impact of seasickness-related symptoms, i.e., seasickness, seasickness symptoms and mal de débarquement on seaman´s health, and how their working environment may affect those factors. **Methods:** Cross-sectional data was collected from 262 seamen answering questionnaire. Majority of the seamen participated while attending a compulsory course held by the Maritime Safety and Survival Training Centre. The majority of participants were men. A chi-square test was used to detect the difference between variables. **Results:** The majority of seamen had experienced seasickness (87.8%) or mal de débarquement (85.8%). Having a history of tension headache (38.1%) and tinnitus (37.9%) was quite common. A total of 30.6% of the participants had been admitted to hospital once or more due to mishaps or accidents on land. **Discussion:** Seasickness and seasickness symptoms together with mal de débarquement are common in Icelandic seamen. Working conditions at sea are demanding and seam to affect the seamen´s health both at sea and ashore, making further research needed.

Development of the National Institute for Occupational Safety and Health Worker Well-Being Questionnaire
Background: This article describes development of the National Institute for Occupational Safety and Health (NIOSH) Worker Well-Being Questionnaire (WellBQ). **Methods:** The NIOSH WellBQ was developed through literature reviews and expert panel recommendations. We drew from a representative sample of the civilian, noninstitutionalized, US working population to pilot the questionnaire. Psychometric analyses were performed on data from 975 respondents to finalize items and optimize the NIOSH WellBQ's psychometric properties. **Results:** The final questionnaire consists of 16 scales, 5 indices, and 31 single items across 5 domains: (1) work evaluation and experience; (2) workplace policies and culture; (3) workplace physical environment and safety climate; (4) health status; and (5) home, community, and

society (experiences and activities outside of work). The instrument demonstrated adequate reliability and validity.

Conclusions: The NIOSH WellBQ is a reliable and valid instrument that comprehensively measures worker well-being.

Work Health and Safety

This month we explore work health and safety issues associated with the Covid-19 pandemic, in particular worker perspectives on Covid-19 risks, the de-isolation of vaccinated COVID-19 health care workers using rapid antigen detection tests, personal protective equipment-related dermatoses in COVID-19 frontline health workers, Covid-19 outbreaks and mortality among public transportation workers, and the suitability of a tool to assess contact status from COVID-19 exposures in the workplace. In non-Covid-19 related studies we explore working conditions in low risk nulliparous, an assessment of workplace safety climate among power sector employees, the effect of intra-group informal interaction on workers' safety behaviours, the effect of safety-oriented planning of expressway truck service areas, the effect of risk communication about work-related stress disorders in healthcare workers, and the risk of respiratory symptoms and loss of lung function in hospital workers.

Worker perspectives on COVID-19 risks: A qualitative study of Latino construction workers in Oakland, California

Background: Latino construction workers in the U.S. have faced a disproportionate risk for COVID-19 infection in the workplace. Prior studies have focused on quantifying workplace risk for COVID-19 infection; few have captured workers' experiences and perspectives. **Methods:** This study describes COVID-19-related workplace risks from the perspectives of Latino construction workers. We conducted a qualitative study using semi-structured phone interviews with Latino construction workers from the Fruitvale District of Oakland, California. **Results:** Twenty individuals were interviewed from December 2020 to March 2021. Nearly all participants (19/20) were Spanish-speaking men; mean age 42.6 years. The majority were low-income and over one-third did not have health insurance. Participants worked in varied construction-related jobs ranging from demolition to office work; additionally, four were day laborers, and three belonged to a labor union. We identified four major themes with public health policy and workplace safety implications: (1) Major concern about the risk of SARS-CoV-2 infection for family health and economic wellbeing; (2) Clarity about mask use and social distancing but not disclosure; (3) Variability in access to additional resources provided by employers; and (4) Uncertainty around structural support for SARS-CoV-2 quarantine/isolation. **Conclusions:** Our findings provide further evidence from workers' own perspectives of the major gaps experienced during the pandemic in workplace protections and resources.

Working conditions in low risk nulliparous women in The Netherlands: are legislation and guidelines a guarantee for a healthy working environment? A cohort study

Background: Hazardous working conditions increase the risk of adverse pregnancy outcomes. In this study, we examine adherence to legislation and guidelines aimed at improving working conditions in pregnancy. **Methods**: Between 2014 and 2016, we recruited a prospective cohort of low-risk nulliparous pregnant women in paid employment or self-employed in 16 community midwifery practices in The Netherlands. Participants completed two questionnaires concerning demographics, education, general health and working conditions between 10-16 and 20-24 weeks of pregnancy. We calculated the proportion of participants with work-related risk factors not in accordance with legislation and/or guidelines. **Results**: Of 269 participants included, 214 (80%) completed both questionnaires. At 10-16 weeks 110 (41%) participants and at 20-24 weeks 129 (63%) participants continued to work under circumstances that did not meet recommendations. Employers provided mandated information on work adjustment to 37 (15%) participants and 96 (38%) participants received no information about the potential hazards while working with biological and chemical hazards. Participants with lower educational attainment (aOR 2.2 95%CI 1.3-3.9), or employment in healthcare (aOR 4.5, 95%CI 2.2-9.0), education/childcare and social service (aOR 2.6, 95%CI 1.1-6.0 2), catering (aOR 3.6, 95%CI 1.1-12) and industry, construction and cleaning (aOR 3.3, 95%CI 1.1-10.3) more often continued work which did not meet recommendations. **Conclusion**: There is poor adherence to national legislation and guidelines for safe working in pregnancy in The Netherlands: 50% of the pregnant women worked under hazardous conditions. Given the impact on adverse pregnancy outcomes as well as on the public purse, action to improve compliance must be taken by all stakeholders.
van Beukering et al. 2022.

De-isolation of vaccinated COVID-19 health care workers using rapid antigen detection test

Background: COVID-19 de-isolation guidelines of health care workers (HCW) were formulated based on evidence describing the duration of infectious viral shedding of the wild SARS-CoV-2 virus. During the periods of COVID-19 vaccination and variants, a test-based approach was recommended to end isolation of HCW, based on emerging data describing the viral kinetics of COVID-19 variants. While Rapid antigen detection tests (RADT) are increasingly used in the diagnosis of COVID-19, their use is limited in de-isolation. **Methods:** We described the use of RADT in the de-isolation of COVID-19 vaccinated HCW with mild infection who were asymptomatic on day 7 post diagnosis in a single center retrospective cohort study during the Omicron surge. **Results:** Of the 480 HCWs, 173 (36%) had positive RADT. The positivity rate of RADT was not different in HCW who received two doses versus three doses of vaccine (34.4% versus 40.3%, p = 0.239). **Conclusions:** A symptom based, test-based approach using RADT is a useful tool in the de-isolation of HCW, with mild disease, in the era of Omicron. Further studies are required to evaluate the role of RADT in de-isolation of patients with severe COVID-19 disease.
Alshukairi et al. 2022.

Personal protective equipment-related dermatoses in COVID-19 frontline health workers. A lesson learned from 1-year single center in the UAE

Background: Frontline health care workers are now required to wear personal protective equipment and use alcohol-based sanitizers and wipes, which may adversely affect the skin. **Methods**: This study assessed

PPE-related dermatoses among health care workers in a COVID-19 facility, Abu Dhabi, United Arab Emirates, using a survey. **Results:** Facial (40.2%), nasal (19.9%), and hand (14.1%) dermatoses were the most common and attributed masks, and gloves with shift duration a contributing factor.

Al Zaabi et al. 2022.

Assessment of workplace safety climate among power sector employees: A comparative study of cross-culture employer in Pakistan

Background: Pakistan's power sector has undergone extensive reforms to improve its technical and monetary performance over the last two decades. However, despite its fast-growing and hazardous nature, safety research remains limited in this context. **Methods:** This study aims to address this gap by assessing the level of safety climate in the power sector and comparing the safety climate in plants operated by multinational companies (MNCs) and local companies (LCs). To this end, five power plants operating in the southern part of the Punjab region (in Pakistan) were included in this study. The Nordic Occupational Safety Climate Questionnaire (NOSACQ-50), an analytical tool comprising of 50 items across seven dimensions, was used to determine the level of safety climate. An independent T-Test was then applied to compare the means in two different setups to draw a conclusion about overall safety climate differences. **Results:** In MNCs, overall management/leadership perception improved; however, workers in both setups responded similarly in many cases. The lowest observed score in both setups was related to worker's prioritization of safety and risk non-acceptance. The study highlights the importance of a company's policies, procedures, and leadership commitments in creating a stronger safety climate by instilling trust in workers. **Findings:** The study further demonstrates that cross-cultural and strong policies devised by multinational companies help to improve the overall safety climate and concludes that promoting an efficient and positive safety climate in the power sector is a long journey and that can only be achieved if all workers and leaders take on an active role.

Arroj et al. 2022.

The suitability and usability of a tool to assess contact status from COVID-19 exposures in the workplace

Background: To assess the usability of a self-assessment COVID-19 exposure tool for workplaces. **Methods:** A COVID-19 exposure tool for workplaces was developed using five risk criteria. Public Health Unit (PHU) assessors who administered the tool documented when they administered the tool, the time taken for finalisation of the assessment and ease of administration. The System Usability Scale was used for workplace managers' perceptions on tool use. Data were assessed using both quantitative and qualitative analysis. **Results:** Eighty-four workplaces used the tool to assess COVID-19 exposure risk. Of those, the outcome provided by the tool did not require modification by the PHU assessor in 70% of workplaces. Eighty per cent of the assessments were completed by the next day. PHU assessors rated the overall ease of administration of the tool as 'easy' or 'very easy' for 85% of workplaces and indicated they would employ the tool across a number of settings including complex workplaces. The mean System Usability Scale was 82. Workplace managers were predominately positive regarding its suitability. **Conclusion:** The tool provides an easy-to-use assessment of SARS-CoV-2 exposure in the workplace. **Implications for public health:** The tool's adoption will empower workplace managers and improve the capacity of public health units to prevent further transmission of SARS-CoV-2 in workplaces.

Capon et al. 2022.

A simulation study on the processes of intra-group informal interaction affecting workers' safety behaviors

Background: The construction industry across the world is characterized by a high safety risk, and the occurrence of these safety accidents has led to substantial economic and social losses. The workers' unsafe behaviors are considered to be a main cause. Thus, recently, scholars in the construction industry have shifted their attention to the investigation of the influencing factors (or antecedents) and their impact on workers' safety behaviors (WSBs), hoping to provide insight into useful management policies. The existing literature has identified many society-level, cooperation-level, project-level, and individual-level concepts influencing WSB, but ignores the influence of intra-group informal interaction (IGII) on WSB. **Methods:** This study constructed a conceptual model for IGII, group knowledge sharing (GKS), and group identification (GI) to determine their influence on construction workers' safety behaviors, and then conducted simulation analysis using the software of NetLogo. **Results:** The results show that IGII, GKS, and GI can positively influence workers' safety behaviors, and IGII can also positively influence WSB through GKS and GI. **Conclusion**: This study enriches the theoretical knowledge on the causation of construction workers' safety behaviors, provides references for project managers to carry out proper safety management, and offers a theoretic foundation for the formulation of industry regulations.

Safety-oriented planning of expressway truck service areas based on driver demand

Background: The rapid development of the economy has promoted the growth of freight transportation. The truck service areas on expressways, as the main places for truck drivers to rest, play an important role in ensuring the driving safety of trucks. If these service areas are constructed densely or provide a plentiful supply of parking areas, they are costly to construct. However, if the distance between two adjacent truck service areas is very large or the number of truck parking spaces in service areas is small, the supply will fail to meet the parking needs of truck drivers. In this situation, the continuous working time of truck drivers will be longer, and this is likely to cause driver fatigue and even traffic accidents. **Methods**: To address these issues, this paper established a non-linear optimization model for truck service area planning of expressways to optimize truck driving safety. An improved genetic algorithm is proposed to solve the model. A case study of a 215.5-kilometers-length section of the Guang-Kun expressway in China was used to demonstrate the effectiveness of the model and algorithm. **Results:** As validated by this specific case, the proposed model and solution algorithm can provide an optimal plan for the layout of truck service areas that meet the parking needs of truck drivers while minimizing the service loss rate. **Conclusion** The research results of this paper can contribute to the construction of truck service areas and the parking management of trucks on expressways.

Risk communication about work-related stress disorders in healthcare workers: A scoping review

Background: Healthcare workers are at risk of stress-related disorders. Risk communication can be an effective preventive health measure for some health risks, but is not yet common in the prevention of stress-related disorders in an occupational healthcare setting. The overall aim is to examine whether risk communication was part of interventions aimed at the prevention of stress-related disorders in healthcare workers. **Method:** We performed a scoping review using the framework of Arksey and O'Malley. We searched in Medline, Web of Science and PsychInfo for studies reporting on preventive interventions of stress-related disorders in healthcare workers between 2005 and December 2020. Studies were included when the intervention reported on at least one element of risk communication and one goal. We predefined four elements of risk communication: risk perception, communication of early stress symptoms, risk factors and prevention; and three goals: inform, stimulate informed decision-making and motivate action. **Results:** We included 23 studies that described 17 interventions. None of the included interventions were primarily developed as risk communication interventions, but all addressed the goals. Two interventions used all four elements of risk communication. The prominent mode of delivery was face to face, mostly delivered by researchers. Early stress symptoms and risk factors were measured by surveys. **Conclusions:** Risk communication on risk factors and early signs of stress-related disorders is not that well studied and evaluated in an occupational healthcare setting. Overall, the content of the communication was not based on the risk perception of the healthcare workers, which limited the likelihood of them taking action.

Do hospital workers experience a higher risk of respiratory symptoms and loss of lung function?

Background: Hospital work environment contains various biological and chemical exposures that can affect indoor air quality and have impact on respiratory health of the staff. The objective of this study was to investigate potential effects of occupational exposures on the risk of respiratory symptoms and lung function in hospital work, and to evaluate potential interaction between smoking and occupational exposures. **Methods:** We conducted a cross-sectional study of 228 staff members in a hospital and 228 employees of an office building as the reference group in Shiraz, Iran. All subjects completed a standardized ATS respiratory questionnaire and performed a spirometry test. **Results:** In Poisson regression, the adjusted prevalence ratios (aPR) among the hospital staff were elevated for cough (aPR 1.90, 95% CI 1.15, 3.16), phlegm production (aPR 3.21, 95% CI 1.63, 6.32), productive cough (aPR 2.83, 95% CI 1.48, 5.43), wheezing (aPR 3.18, 95% CI 1.04, 9.66), shortness of breath (aPR 1.40, 95% CI 0.93, 2.12), and chest tightness (aPR 1.73, 95% CI 0.73, 4.12). Particularly laboratory personnel experienced increased risks of most symptoms. In linear regression adjusting for confounding, there were no significant differences in lung function between the hospital and office workers. There was an indication of synergism between hospital exposures and current smoking on FEV1/FVC% (interaction term β = - 5.37, 95% CI - 10.27, - 0.47). **Conclusions:** We present significant relations between hospital work, especially in laboratories, and increased risks of respiratory symptoms. Smoking appears to enhance these effects considerably. Our findings suggest that policymakers should implement evidence-based measures to prevent these occupational exposures.

COVID-19 outbreaks and mortality among public transportation workers: California, January 2020-May 2022

Background: Work-related factors can contribute to risk for exposure to and infection with SARS-CoV-2, the virus that causes COVID-19, and subsequent COVID-19-attributable outcomes, including death. Comparing COVID-19 metrics across industries can help identify workers at highest risk. Elevated COVID-19 mortality rates have been reported among all transportation workers, as well as specifically in public transportation industries (1-3). **Methods:** The California Department of Public Health (CDPH) calculated public transportation industry-specific COVID-19 outbreak incidence during January 2020-May 2022 and analyzed all laboratory-confirmed COVID-19 deaths among working-age adults in California to calculate public transportation industry-specific mortality rates during the same period. **Results:** Overall, 340 confirmed COVID-19 outbreaks, 5,641 outbreak-associated cases, and 537 COVID-19-associated deaths were identified among California public transportation industries. Outbreak incidence was 5.2 times as high (129.1 outbreaks per 1,000 establishments) in the bus and urban transit industry and 3.6 times as high in the air transportation industry (87.7) as in all California industries combined (24.7). Mortality rates were 2.1 times as high (237.4 deaths per 100,000 workers) in transportation support services and 1.8 times as high (211.5) in the bus and urban transit industry as in all industries combined (114.4). **Conclusion:** Workers in public transportation industries are at higher risk for COVID-19 workplace outbreaks and mortality than the general worker population in California and should be prioritized for COVID-19 prevention strategies, including vaccination and enhanced workplace protection measures.

Heinzerling et al. 2022.

Risk Assessment

This month explores the cancer risk amongst firefighters and police, the physiological demands of common occupational tasks among police officers, the risks of working at the dining table versus ergonomic workstation and a work-related musculoskeletal disorders (WMSDS) risk-assessment system.

Cancer risk among firefighters and police in the Ontario workforce

Background: Firefighters and police often work in high-stress, complex environments with known and suspected carcinogenic exposures. We aimed to characterise cancer incidence among firefighters and police. **Methods:** The Occupational Disease Surveillance System (ODSS) was used to identify workers employed as firefighters or police in Ontario. A cohort of workers were identified using lost-time workers' compensation claims data and followed for cancer in the Ontario Cancer Registry (1983-2020). Cox proportional hazard models were used to estimate HRs and 95% CIs for primary site-specific cancer diagnoses adjusted for age at start of follow-up, birth year and sex. **Results:** A total of 13 642 firefighters and 22 595 police were identified in the cohort. Compared with all other workers in the ODSS, firefighters and police had increased risk of prostate cancer (firefighters: HR=1.43, 95% CI 1.31 to 1.57; police: HR=1.47, 95% CI 1.35 to 1.59), colon cancer (firefighters: HR=1.39, 95% CI 1.19 to 1.63; police: HR=1.39, 95% CI 1.21 to 1.60) and skin melanoma (firefighters: HR=2.38, 95% CI 1.99 to 2.84; police: HR=2.27, 95% CI 1.96 to 2.62). Firefighters also had increased risk of cancer of the pancreas, testis and kidney, as well as non-Hodgkin's lymphoma and leukaemia. Police had increased risk of thyroid, bladder and female breast cancer. When compared directly with the police, firefighters had an elevated risk of mesothelioma and testicular cancer. **Conclusions:** Firefighters and police demonstrated some similar as well as some unique cancer risks. Findings from this larger worker population may have important implications for workplace and

policy-level changes to improve preventative measures and reduce potential exposures to known carcinogenic hazards.

Physiological demands of common occupational tasks among Australian police officers: A descriptive analysis

Background: The aim of this study was to investigate the physiological demands placed on Australian police officers carrying out common operational tasks. **Methods:** Forty participants (n = 40) from an Australian police force (mean age = 33.58 ± 7.78 years, mean height = 177.70 ± 7.28 cm, mean weight = 85.68 ± 14.52 kg, mean years of service: 6.74 ± 6.29 years) were recruited through preidentified local area commands. Spanning nine police stations from the same Australian state, volunteers wore monitoring devices to collect physiological measures (heart rate, respiratory rate, and skin temperature) throughout the course of four consecutive shifts (two day shifts and two night shifts). Descriptive data were recorded and analyzed by task and changes in physiological measures. **Results:** Of the 345 duty calls attended by participants, the four most commonly reported tasks were as follows: 'check bona fides' (n = 76; 22%), 'driving urgently' (n = 45; 13%), 'attending a domestic incident' (n = 37; 10%), and 'attending a concern for welfare' (n = 30; 8%). Mean percentages of maximum heart rates (%HRmax) were considered of very light exercise intensity and ranged from 47.11 (± 7.18) to 50.15 (± 9.35) % for checking bona fides through to driving urgently respectively. Fifteen percent of tasks attended had officers exceed 100 %HRmax (near maximal to maximal exercise intensity). Mean skin temperatures varied little (36.02-36.27°C) between tasks, while mean respiratory rates were lowest when attending a domestic incident and highest when driving urgently (22.56 ± 3.83 and 24.72 ± 6.12 breaths/min, respectively). **Conclusion:** Police officers experienced numerous physiological challenges ranging from an intensity of very light exercise through to near maximal and maximal exercise throughout their working day with occasions where their heart rates exceeded 100 %HRmax. These findings highlight the physiological stress associated with common occupational policing tasks, highlighting the importance of cardiovascular health in police officers and the need for cardiovascular monitoring and conditioning.

Home office versus ergonomic workstation - is the ergonomic risk increased when working at the dining table? An inertial motion capture based pilot study

Background: In order to reduce the risk of infection with Sars-Cov-2, work practices have been shifted to the home office in many industries. The first surveys concerning this shift indicate an increase in musculoskeletal complaints of many employees. The aim of this study was to compare the ergonomic risk in the upper extremities and trunk of working in a home office with that of working in an ergonomically optimized workplace. **Methods:** For this purpose, 20 subjects (13w/7m) aged 18-31 years each performed a 20-minute workplace simulation (10 min writing a text, 10 min editing a questionnaire) in the following set up: on a dining table with dining chair and laptop (home office) and on an ergonomically adjusted workstation (ergonomically optimized workplace). The subjects were investigated using a combined application of a motion capture kinematic analysis and the rapid upper limb assessment (RULA) in order to identify differences in the ergonomic risk. **Results:** Significantly reduced risk values for both shoulders (left:

p < 0.001; right: p = 0.02) were found for the ergonomically optimized workstations. In contrast, the left wrist (p = 0.025) showed a significantly reduced ergonomic risk value for the home office workstation. **Conclusion:** This study is the first study to compare the ergonomic risk between an ergonomically optimized workplace and a home office workstation. The results indicate minor differences in the upper extremities in favor of the ergonomically optimized workstation. Since work-related musculoskeletal complaints of the upper extremities are common among office workers, the use of an ergonomically optimized workstation for home use is recommended based on the results.

A work-related musculoskeletal disorders (WMSDS) risk-assessment system using a single-view pose estimation model

Background: Musculoskeletal disorders are an unavoidable occupational health problem. In particular, workers who perform repetitive tasks onsite in the manufacturing industry suffer from musculoskeletal problems. **Methods:** In this paper, we propose a system that evaluates the posture of workers in the manufacturing industry with single-view 3D human pose-estimation that can estimate the posture in 3D using an RGB camera that can easily acquire the posture of a worker in a complex workplace. **Results:** The proposed system builds a Duckyang-Auto Worker Health Safety Environment (DyWHSE), a manufacturing-industry-specific dataset, to estimate the wrist pose evaluated by the Rapid Limb Upper Assessment (RULA). Additionally, we evaluate the quality of the built DyWHSE dataset using the Human3.6M dataset, and the applicability of the proposed system is verified by comparing it with the evaluation results of the experts. **Conclusions:** The proposed system provides quantitative assessment guidance for working posture risk assessment, assisting the continuous posture assessment of workers.

Chronic Health Issues

This month we explore work related chronic health issues associated with a cancer diagnosis, polycystic ovary syndrome, Type 2 diabetes, autism, and rheumatoid arthritis.

Changes in working status after cancer diagnosis and socio-demographic, clinical, work-related, and psychological factors associated with it

Background: While many studies investigated changes in working status in cancer survivors, most studies have been performed in survivors of breast cancer and few studies evaluated factors associated with changes in the working status of cancer survivors comprehensively. We aimed to evaluate the changes in the working status of cancer survivors after diagnosis and socio-demographic, clinical, work-related and psychological factors associated with it. **Methods:** We conducted a cross-sectional survey of adult patients with cancer who were working at the time of diagnosis. A trained interviewer inquired about participants' current working status, including leave of absence, discontinuing, continuing, and changing work. Sociodemographic, clinical, work-related and psychological factors were measured. Multinomial logistic regression was used to identify factors associated with changes in the working status. **Results:** Among the 730 patients, 29%, 18% and 6% were currently on a discontinued working, leave of absence and had

changed jobs, respectively. Patients who discontinued working after cancer diagnosis were more likely to be female, have ≥ $3,000 of monthly family income, not be the principal wage earners for their families and be blue-collar workers. In clinical characteristics, advanced-stage cancer and experienced cancer recurrence was associated with leave of absence and discontinued working. In work-related and psychological factors, stress due to insufficient job control (relative risk ratio [RRR] = 2.26), interpersonal conflict (RRR = 1.86), job insecurity (RRR = 2.63), organizational system (RRR = 3.49), and lack of reward (RRR = 11.76), and less meaning to work were more likely to discontinue working after a cancer diagnosis.

Conclusion: Occupational health care professionals and other stakeholders need to openly communicate with patients with cancer about potential barriers during the return-to-work trajectory.

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Evidence Level: 4B
Link: https://bmccancer.biomedcentral.com/articles/10.1186/s12885-022-10013-8

Women with polycystic ovary syndrome have poorer work ability and higher disability retirement rate at midlife: A Northern Finland Birth Cohort 1966 study
Background: Polycystic ovary syndrome (PCOS) presents with multiple comorbidities potentially affecting function. This was the first general population-based study to evaluate work ability, participation in working life, and disability retirement in middle-aged women with and without PCOS. **Design:** This is a cohort study. **Methods:** Women with PCOS (n = 280) and women without PCOS symptoms or diagnosis (n = 1573) were identified in the Northern Finland Birth Cohort in 1966 and were evaluated for self-rated work ability and potential confounders at age 46. Next, incidence rate ratios (IRRs) for disability and unemployment days were extracted from national registers during a prospective 2-year follow-up. Lastly, we assessed hazard ratios (HRs) for disability retirement between 16 and 52 years of age from national registers. **Results:** The women with PCOS reported poorer ability to work at age 46, especially due to poorer health. During the 2-year follow-up period, the affected women gained on average an additional month of disability and unemployment days, corresponding to an approximately 25% higher risk for both disability (IRR (95% CI): 1.25 (1.22-1.27)) and unemployment days (IRR (95% CI): 1.26 (1.23-1.28)) in models adjusted for health and socioeconomic factors. Lastly, we found a two-fold higher cumulative risk for disability retirement by age 52 compared to non-PCOS women (HR (95% CI): 1.98 (1.40-2.80)), which remained after adjusting for confounding factors (aHR (95% CI): 1.55 (1.01-2.38)). **Conclusions:** PCOS is associated with lower participation in working life already in midlife. Acknowledging PCOS-related multimorbidity, concerted efforts are needed to support sustainable careers for women with PCOS.

Kujanpää et al. 2022.
European Journal of Endocrinology, vol. 187, no. 3.
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Keywords: Polycystic ovary syndrome; work ability; disability retirement; women; Finland.
Evidence Level: 4B
Link: https://eje.bioscientifica.com/view/journals/eje/187/3/EJE-22-0027.xml

One drop improves productivity for workers with Type 2 diabetes: One drop for workers with Type 2 diabetes
Background: Diabetes research on work productivity has been largely cross-sectional and retrospective, with only one known randomized controlled trial (RCT) published, to our knowledge. Secondary analysis of the Fit-One RCT tested the effect of One Drop's digital health program on workplace productivity outcomes, absenteeism, and presenteeism, for employees and specifically for older workers with type 2 diabetes. **Methods:** Analysis of the 3-month Fit-One trial data from employees who have type 2 diabetes explored productivity using logistic analyses and generalized estimating equations. **Results:** Treatment and control group comparisons showed that workers (N = 125) using One Drop see direct benefits to workplace productivity, which leads to productivity savings for employers. **Conclusion:** This was the first RCT to

demonstrate that a mobile health application for managing type 2 diabetes can positively affect productivity at work.

Lavaysse et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 8.

Participatory approach to create a supportive work environment for employees with chronic conditions: A pilot implementation study

Background: To evaluate a pilot implementation of an organizational-level intervention. The participatory approach (PA) was used to create a supportive work environment for employees with chronic conditions, with a key role for occupational physicians (OPs). **Methods**: Twenty-eight semi-structured interviews were conducted with OPs and stakeholders within their organizations. Furthermore, observational data and research notes were gathered. Data analysis occurred through content analysis. **Results**: Recruitment of organizations was challenging, with a reach of 25%. Dose delivered, dose received, and fidelity differed across the three organizations. Organizations were positive about the PA as a method to improve support for employees with chronic conditions. **Conclusions**: The PA could be of added value for creating a supportive work environment. However, research is needed on activating organizations to improve support for employees with chronic conditions.

Bosma et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 8.

Autistic adults' views and experiences of requesting and receiving workplace adjustments in the UK

Background: This article examines 181 autistic adults' views toward, and experiences of, requesting and receiving workplace adjustments in the UK. **Methods:** Using an online survey, we collected both qualitative and quantitative data relating to individuals' experiences. While the majority of participants perceived workplace adjustments to be important, many were not receiving them. **Results:** Analysis of open-ended text responses highlighted specific challenges that autistic people face in requesting and receiving adjustments. Specifically, participants felt the onus fell on them to (1) identify their need for adjustments; (2) establish the specific adjustments that would be beneficial and (3) request adjustments from their employer. Yet, they reported struggling with this process. Participants also highlighted a range of social and organisational barriers to the successful implementation of workplace adjustments. Unsurprisingly, the lack of successfully implemented adjustments had far-reaching impacts on participants' wellbeing as well as the choices they made about their future employment. **Findings:** These findings highlight the need for employers to take a more active role in the identification and implementation of workplace adjustments, as well as a need for more understanding and inclusive working environments that truly allow autistic employees to thrive in the workplace.

Davies et al. 2022.

PLoS One, vol. 17, no. 8.

Neither low social support nor low decision latitude at work is associated with disease remission among patients with rheumatoid arthritis: Results from the Swedish EIRA study

Background: To investigate the association between psychosocial vulnerability, defined as either low social support or low decision latitude at work, and disease remission at 3, 12, and 60 months in patients with rheumatoid arthritis (RA). **Methods**: This cohort study included all patients enrolled in both the Swedish Epidemiological Investigation of Rheumatoid Arthritis (EIRA) 1996-2015 and the Swedish Rheumatology Quality Register (SRQ, n = 2820). Information on social support and decision latitude at work at RA diagnosis were identified from the EIRA questionnaire. Indexes for levels of social support and decision latitude at work, respectively, were calculated based on the questionnaire. Low social support and low decision latitude at work, respectively, were identified by a score in the lowest quartile and compared with the three other quartiles (not low). Disease-activity parameters were retrieved from SRQ at 3, 12, and 60 months. The associations between social support or decision latitude at work, respectively, and Disease Activity Score 28 joint count with C-reactive protein (DAS28-CRP) remission were analysed using logistic regression models adjusted for age, sex, smoking habits, alcohol habits, symptom duration, and educational level. **Results**: Having low social support (n = 591) was not associated with DAS28-CRP remission at 3 (OR 0.93, 95% CI 0.74-1.16), 12 (OR 0.96, 95%CI 0.75-1.23), or 60 (OR 0.89, 95%CI 0.72-1.10) months compared to not low social support (n = 2209). No association was observed for low (n = 212) versus not low (n = 635) decision latitude at work and DAS28-CRP remission at 3 (OR 0.84, 95%CI 0.54-1.31), 12 (OR 0.81, 95%CI 0.56-1.16), or 60 (OR 1.37, 95%CI 0.94-2.01) months. **Conclusion**: In a country with general access to healthcare, psychosocial vulnerability does not influence the likelihood of achieving remission in early RA.

Short- and long-term impact of cancer on employment and financial outcomes of adolescents and young adults (AYAs): A large population-based case-control registry study in the Netherlands

Background: Adolescent and young adult (AYA) cancer survivors, 18-39 years at initial cancer diagnosis, often self-report negative consequences of cancer (treatment) for their career. Less is known, however, about the objective impact of cancer on employment and financial outcomes. This study examines the employment and financial outcomes of AYA cancer survivors with nationwide population-based registry data and compares the outcomes of AYAs with cancer with an age- and sex-matched control population at year of diagnosis, 1 year later (short-term) and 5 years later (long-term). **Patients and methods:** A total of 2527 AYAs, diagnosed in 2013 with any invasive tumor type and who survived for 5 years, were identified from the Netherlands Cancer Registry (clinical and demographic data) and linked to Statistics Netherlands (demographic, employment and financial data). AYAs were matched 1 : 4 with a control population based on age and sex (10 108 controls). Analyses included descriptive statistics, chi-square tests, independent samples t-tests, McNemar tests and logistic regression. **Results:** AYA cancer survivors were significantly less often employed compared with their controls 1 year (76.1% versus 79.5%, P < 0.001) and 5 years (79.3% versus 83.5%, P < 0.001) after diagnosis, and received more often disability benefits (9.9% versus 3.1% 1 year after diagnosis, P < 0.001; 11.2% versus 3.8% 5 years after diagnosis, P < 0.001). Unemployed AYAs were more often diagnosed with higher disease stages (P < 0.001), treated with chemotherapy (P < 0.001), radiotherapy (P < 0.001) or hormone therapy (P < 0.05) and less often with local surgery (P < 0.05) compared with employed AYAs 1 and 5 years after diagnosis. **Conclusion:** Based on objective, nationwide, population-based registry data, AYAs' employment and financial outcomes are significantly affected compared with age- and sex-matched controls, both short and long-term after cancer diagnosis. Providing

support regarding employment and financial outcomes from diagnosis onwards may help AYAs finding their way (back) into society.

Occupational Exposure

This month we explore research on issues associated with occupational exposure to benzene, low levels of noise and solvents and second-hand smoke exposure, metal fumes in casting and welding workers. Other topics explored include the association between occupational exposures and breast cancer, lung cancer, hyperuricemia and risk of testicular germ cell tumours in wood-related jobs.

Breast cancer incidence among female workers by different occupations and industries: A longitudinal population-based matched case-control study in Taiwan

Background: Breast cancer is the leading cause of cancer incidence worldwide and in Taiwan. The relationship between breast cancer and occupational types remains unclear. This study aimed to investigate lifetime breast cancer incidence by different occupational industries among female workers in Taiwan. **Methods:** A population-based retrospective case-control study was conducted using three nationwide population-based databases. Matched case and control groups were identified with 1-to-4 exact matching among 103,047 female workers with breast cancer diagnosed in 2008-2017 and those without breast cancer. Their lifetime labor enrolment records were tracked using the National Labor Insurance Database, 1950-2017. Conditional logistic regression was used to analyze the association between types of occupational industries and risk of incident breast cancer. **Results:** Our study found slightly significant breast cancer risk among the following major occupational classifications: manufacturing (OR: 1.027, 95% CI: 1.011-1.043); wholesale and retail trade (OR: 1.068, 95% CI: 1.052-1.084); information and communication (OR: 1.074, 95% CI: 1.043-1.105); financial and insurance activities (OR: 1.109, 95% CI: 1.086-1.133); real estate activities (OR: 1.050, 95% CI: 1.016-1.085); professional, scientific, and technical activities (OR: 1.118, 95% CI: 1.091-1.145); public administration, defense, and social security (OR: 1.054, 95% CI: 1.023-1.087), education (OR: 1.199, 95% CI: 1.168-1.230); and human health and social work activities (OR: 1.125, 95% CI: 1.096-1.156). **Conclusions:** Greater percentages of industrial occupations (i.e., manufacturing, wholesale and retail, or health professionals) were associated with slightly increased breast cancer risk. Further studies should investigate the possible risk factors among female workers in those industries with slightly higher incidence of breast cancer.

Occupational exposures and esophageal cancer: Prog study

Background: Esophageal cancer is the sixth most common cause of cancer death worldwide. In France, Brittany is one of the regions most seriously affected. This increased incidence is usually linked to high rates of alcohol overconsumption and smoking, established risk factors for esophageal cancer, but the region has special occupational exposures. We aim to describe the occupational exposures of patients with esophageal cancer. **Methods**: Between June and October 2020, we conducted a monocentric descriptive study in a French Teaching Hospital and identified 37 eligible patients. We gathered data through a systematic individual interview for each participant and by an analysis of their medical file. **Results:** We

were able to include 36 patients; most were men (n = 27, 75.0%) and smokers (n = 25, 69.4%), 21 (58.3%) presented an adenocarcinoma esophageal cancer, 13 (36.1%) a squamous cell cancer, and 2 other types. On occupational exposure, patients declared respectively high exposure by manipulating asbestos materials for 11 (30.6%) patients, regularly in contact with benzene by handling fuel in 7 cases (19.4%), chlorinated solvents in 4 cases (11.1%), pesticides in 4 cases, and ionizing radiation exposure in 3 patients (8.3%). **Conclusion:** Our findings support the creation of a large-scale study to explore the impact of occupational exposures, particularly exposure to asbestos and hydrocarbons.

Carcinogenic risk assessment and changes in Spirometric indices in casting and welding workers exposed to metal fumes

Background: : The aim of this study was to investigate exposure to dust, and metal fumes, changes in pulmonary function indices among industrial workers to estimate the carcinogenic and non-carcinogenic risk of exposure to occupational metal fume. **Methods**: This cross-sectional study was performed on 98 workers exposed to metal fumes. Air sampling was performed according to the NIOSH 0500 method and was analyzed by gravimetry and metal levels were analyzed by atomic absorption spectrometry. Spirometric results for 2010-2016 were collected. Carcinogenic and non-carcinogenic risk assessments were performed according to the US Environmental Protection Agency guidelines. Data were analyzed by SPSS 20 software. **Results**: The mean occupational exposure of the subjects to workplace dust and iron fumes was 15.95 ± 6.65 mg/m3 and 13.18 ± 3.06 mg/m3 respectively. During these 6 years, the FVC (P=0.04), PEFR (P=0.04), and FEV1 (P=0.03) indices decreased significantly among welders, but there was no significant difference between FEV1/ FVC indexes. Also, the mean of FEV1 and PEFR decreased significantly amongst casting workers, but FVC and FEV1/ FVC had no significant difference. Multivariate regression showed that in both jobs, BMI and work history were related to pulmonary function indices. The mean total excess ifetime carcinogenic risk (ELCR) of hexavalent chromium in the study population was 0.708 per 1000 people and the mean non-carcinogenic risk of hexavalent chromium was HQ = 19.62. **Conclusions**: The results showed that exposure to metal fumes in casting and welding jobs reduces pulmonary function indices. Although the average occupational exposure to hexavalent chromium is lower than the recommended limit and the risk of carcinogenesis is within an acceptable range, the risk of non-carcinogenic effects among workers is significant Therefore, it is important to prevent this problem, by adequate ventilation and using respiratory masks.

Occupational Benzene exposure in the Norwegian offshore petroleum industry, 2002-2018

Background: Workers on offshore petroleum installations are at risk of being exposed to benzene which is carcinogenic to humans. The present study aimed to assess the time trend of full-shift benzene exposure from 2002 to 2018 in order to characterize benzene exposure among laboratory technicians, mechanics, process operators, and industrial cleaners, and to examine the possible determinants of benzene exposure. **Methods**: A total of 924 measurements of benzene exposure from the Norwegian petroleum offshore industry were included. The median sampling duration was 680 min, ranging from 60 to 940 min. The overall geometric mean (GM) and 95% confidence interval, time trends, and determinants of exposure

were estimated using multilevel mixed-effects tobit regression analyses. Time trends were estimated for sampling duration below and above 8 h, both overall and for job groups. The variability of exposure between installation and workers was investigated in a subset of data containing worker identification.

Results: The overall GM of benzene exposure was 0.004 ppm. When adjusting for job group, design of process area, season, wind speed, and sampling duration, industrial cleaners had the highest exposure (GM = 0.012). Laboratory technicians, mechanics, and process operators had a GM exposure of 0.004, 0.003, and 0.004 ppm, respectively. Overall, the measured benzene exposure increased by 7.6% per year from 2002 to 2018. Mechanics had an annual increase of 8.6% and laboratory technicians had an annual decrease of 12.6% when including all measurements. When including only measurements above 8 h, mechanics had an increase of 16.8%. No statistically significant time trend was found for process operators. Open process area, high wind speed, and wintertime were associated with reduced exposure level.

Conclusions: An overall increase in measured exposure was observed from 2002 to 2018. The increase may reflect changes in measurement strategy from mainly measuring on random days to days with expected exposure. However, the time trend varied between job groups and was different for sampling duration above or below 8 h. Industrial cleaners had the highest exposure of the four job groups while no differences in exposure were observed between laboratory technicians, mechanics, and process operators. The design of the process area, job group, wind speed, and season were all significant determinants of benzene exposure.

Lung cancer incidence among world trade center rescue and recovery workers

Background: Many World Trade Center disaster (WTC) rescue and recovery workers (WTC RRWV) were exposed to toxic inhalable particles. The impact of WTC exposures on lung cancer risk is unclear.

Methods: Data from the WTC Health Program General Responders Cohort (WTCGRC) were linked to health information from a large New York City health system to identify incident lung cancer cases. Incidence rates for lung cancer were then calculated. As a comparison group, we created a microsimulation model that generated expected lung cancer incidence rates for a WTC- and occupationally-unexposed cohort with similar characteristics. We also fitted a Poisson regression model to determine specific lung cancer risk factors for WTC RRWV. **Results:** The incidence of lung cancer for WTC RRWV was 39.5 (95% confidence interval [CI]: 30.7-49.9) per 100,000 person-years. When compared to the simulated unexposed cohort, no significant elevation in incidence was found among WTC RRWV (incidence rate ratio [IRR] 1.34; 95% CI: 0.92-1.96). Predictors of lung cancer incidence included age, smoking intensity, and years since quitting for former smokers. In adjusted models evaluating airway obstruction and individual pre-WTC occupational exposures, only mineral dust work was associated with lung cancer risk (IRR: 2.03; 95% CI: 1.07-3.86).

Discussion: In a sample from a large, prospective cohort of WTC RRWV we found a lung cancer incidence rate that was similar to that expected of a WTC- and occupationally-unexposed cohort with similar individual risk profiles. Guideline-concordant lung cancer surveillance and periodic evaluations of population-level lung cancer risk should continue in this group.

Temporary and permanent auditory effects associated with occupational co-exposure to low levels of noise and solvents

Background: This study aimed to assess temporary and permanent auditory effects associated with occupational co-exposure to low levels of noise and solvents. **Methods:** Cross-sectional study with 25 printing industry workers simultaneously exposed to low noise (<80 dBA TWA) and low levels of solvents. The control group consisted of 29 industry workers without the selected exposures. Participants answered a questionnaire and underwent auditory tests. Auditory fatigue was measured by comparing the acoustic reflex threshold before and after the workday. **Results:** Workers co-exposed to solvents and noise showed significantly worse results in auditory tests in comparison with the participants in the control group. Auditory brainstem response results showed differences in III-V interpeak intervals ($p = 0.046$ in right ear; $p = 0.039$ in left ear). Mean dichotic digits scores (exposed = 89.5 ± 13.33; controls = 96.40 ± 4.46) were only different in the left ear ($p = 0.054$). The comparison of pre and post-acoustic reflex testing indicated mean differences ($p = 0.032$) between the exposed (4.58 ± 6.8) and controls (0 ± 4.62) groups. **Findings:** This study provides evidence of a possible temporary effect (hearing fatigue) at the level of the acoustic reflex of the stapedius muscle. The permanent effects were identified mainly at the level of the high brainstem and in the auditory ability of binaural integration.

Bohn et al. 2022.

Influence of occupational exposure on hyperuricemia in steelworkers: A nested case-control study

Background: Occupational exposure may be associated with an increased risk of developing hyperuricemia. This study sheds lights on the association between occupational exposure and hyperuricemia in steelworkers. **Method:** A nested case-control study was conducted within a cohort of workers in steel companies to explore the association between occupational exposure and hyperuricemia. The case group consisted of a total of 641 cases of hyperuricemia identified during the study period, while 641 non-hyperuricemia subjects with the same age and gender distribution were randomly selected from the cohort as the control group. **Results:** The incidence rate of hyperuricemia among workers in the steel company was 17.30%, with an incidence density of 81.32/1,000 person-years. In comparison to the reference group, the risks of developing hyperuricemia for steelworkers undergoing ever shifts, current shifts, heat exposure, and dust exposure were 2.18 times, 1.81 times, 1.58 times and 1.34 times higher respectively. The odds ratios (ORs) and 95% confidence intervals (CIs) were 1.87(1.12-3.13) and 2.02(1.21-3.37) for the cumulative number of days of night work at 0-1,972.80 and $\geq$ 1,972.80 (days), respectively. Compared to the group with the cumulative heat exposure of 0 (°C/year), the ORs (95% CI) for the risk of developing hyperuricemia in the groups with the cumulative heat exposure of 0-567.83 and $\geq$ 567.83 (°C/year) were 1.50(1.02-2.22) and 1.64(1.11-2.43), respectively. The OR (95% CI) for the risk of developing hyperuricemia was 1.56(1.05-2.32) at the cumulative dust exposure of $\geq$ 30.02 (mg/m^3/year) compared to that at the cumulative dust exposure of 0 (mg/m^3/year). Furthermore, there was a multiplicative interaction between heat exposure and dust exposure in the development of hyperuricemia. **Conclusion:** Shift work, heat, and dust are independent risk factors for the development of hyperuricemia in steelworkers. Additionally, there is a multiplicative interaction between heat exposure and dust exposure in the development of hyperuricemia. Interventions for shift work, heat and dust may help to reduce the incidence rate of hyperuricemia and improve the health of steelworkers.

Chen et al. 2022.

Parental occupational exposures in wood-related jobs and risk of testicular germ cell tumours in offspring in NORD-TEST a registry-based case-control study in Finland, Norway, and Sweden

Background: We assessed the association between parental prenatal exposures in wood-related jobs and risk of testicular germ cell tumours (TGCT) in offspring. **Methods:** NORD-TEST, a registry-based case-control study in Sweden, Finland and Norway, included 8112 TGCT cases diagnosed at ages 14-49 years between 1978 and 2012 with no history of prior cancer, and up to four controls matched to each case on year and country of birth. Parents of cases and controls were identified via linkages with the population registries and their occupational information was retrieved from censuses. The Nordic Occupational Cancer Study Job-Exposure Matrix was used to assign occupational exposures to each parent. Logistic regression models were used to estimate odds ratios (OR) and 95% confidence intervals (CI). **Results:** Maternal wood-related job was not associated with the risk of TGCT in offspring (OR 1.08, CI 0.55-2.14), while paternal wood-related job was associated with a decreased risk of TGCT in offspring (OR 0.85, CI 0.75-0.96). None of the specific wood-related jobs, such as upholsterers, sawyers, or construction carpenters, were significantly associated with a risk of TGCT. Only exception was observed in a sensitivity analysis which showed an increased risk in the small group of sons of fathers working as 'cabinetmakers and joiners' the year before conception (OR of 2.06, CI 1.00-4.25). **Conclusion:** This large-scale NORD-TEST analysis provided no evidence of an association between parental prenatal exposures in wood-related jobs and TGCT in sons.

Corbin et al. 2022.

Factors associated with secondhand smoke exposure among non-smoking employees in the workplace: A cross-sectional study in Qingdao, China

Background: This study was conducted to describe secondhand smoke (SHS) exposure among non-smoking employees in the workplace, and identify factors related to SHS exposure in Qingdao. **Methods:** The study participants covered key non-smoking places stipulated in the "Qingdao City Smoking Control Regulations," which included three categories: restaurants, bars, and office buildings. Airborne nicotine concentration in the workplace and saliva cotinine concentration of employees were measured. The questionnaire included employees' demographic factors, smoke-free measures in the workplace, employers' tobacco hazard knowledge, and attitudes towards smoke-free policy. **Results:** A total of 222 non-smoking employees and 46 non-smoking employers were included in the study. The median concentrations of airborne nicotine and salivary cotinine were 0.389 µg/m3 and 0.575 ng/mL, respectively. Educational status, average number of workplace smokers per day, exposure time to SHS in the workplace, and whether smoking and non-smoking areas were divided significantly related to airborne nicotine concentration. Age, educational status, exposure time to SHS in the workplace, tobacco control training and publicity, and whether the employers support the "Qingdao Tobacco Control Regulation" were significantly related to salivary cotinine concentration. **Conclusions:** Despite the implementation of the "Qingdao Smoking Control Regulations" in 2013, the workplace remains an important location for SHS exposure. Interventions such as raising workers' awareness of the risks associated with SHS exposure through health education and developing smoking prevention and cessation programs to reduce SHS exposure in the workplace are urgently needed.

Jia et al. 2022.

Sedentary Practices

This month we explore the effectiveness of an intervention for reducing sitting time and improving health in office workers, and the correlation between employee performance, well-being, job satisfaction, and life satisfaction in sedentary jobs.

Effectiveness of an intervention for reducing sitting time and improving health in office workers: Three arm cluster randomised controlled trial

Background: To evaluate the effectiveness of an intervention, with and without a height adjustable desk, on daily sitting time, and to investigate the relative effectiveness of the two interventions, and the effectiveness of both interventions on physical behaviours and physical, biochemical, psychological, and work related health and performance outcomes. **Design:** Cluster three arm randomised controlled trial with follow-up at three and 12 months. **Setting:** Local government councils in Leicester, Liverpool, and Greater Manchester, UK. **Participants:** 78 clusters including 756 desk based employees in defined offices, departments, or teams from two councils in Leicester, three in Greater Manchester, and one in Liverpool. **Interventions:** Clusters were randomised to one of three conditions: the SMART Work and Life (SWAL) intervention, the SWAL intervention with a height adjustable desk (SWAL plus desk), or control (usual practice). **Main outcomes measures:** The primary outcome measure was daily sitting time, assessed by accelerometry, at 12 month follow-up. Secondary outcomes were accelerometer assessed sitting, prolonged sitting, standing and stepping time, and physical activity calculated over any valid day, work hours, workdays, and non-workdays, self-reported lifestyle behaviours, musculoskeletal problems, cardiometabolic health markers, work related health and performance, fatigue, and psychological measures. **Results:** Mean age of participants was 44.7 years, 72.4% (n=547) were women, and 74.9% (n=566) were white. Daily sitting time at 12 months was significantly lower in the intervention groups (SWAL -22.2 min/day, 95% confidence interval -38.8 to -5.7 min/day, P=0.003; SWAL plus desk -63.7 min/day, -80.1 to -47.4 min/day, P<0.001) compared with the control group. The SWAL plus desk intervention was found to be more effective than SWAL at changing sitting time (-41.7 min/day, -56.3 to -27.0 min/day, P<0.001). Favourable differences in sitting and prolonged sitting time at three and 12 month follow-ups for both intervention groups and for standing time for the SWAL plus desk group were observed during work hours and on workdays. Both intervention groups were associated with small improvements in stress, wellbeing, and vigour, and the SWAL plus desk group was associated with improvements in pain in the lower extremity, social norms for sitting and standing at work, and support. **Conclusions:** Both SWAL and SWAL plus desk were associated with a reduction in sitting time, although the addition of a height adjustable desk was found to be threefold more effective.

Edwardson et al. 2022.
BMJ, vol. 378.
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Keywords: Invention; sitting time; health; office workers.
Evidence Level: 2B
Link: https://www.bmj.com/content/378/bmj-2021-069288.long

Correlation between employee performance, well-being, job satisfaction, and life satisfaction in sedentary jobs in Slovenian enterprises

Background: The purpose of this study was to explore the relationship between employees' work performance and their well-being, job satisfaction, and life satisfaction in sedentary jobs in Slovenian enterprises using a mixed-methods research design. **Methods:** The quantitative component of the research included the responses to four selected questionnaires of 120 employees in 22 identified enterprises (out of 81), with more than 20 employees, having more than 85 percent sedentary jobs. Each of four questionnaires was chosen to cover one area of enquiry under the research foci of work performance, job satisfaction, life satisfaction and well-being. The statistical program STATA was used for data analyses. **Results:** The analysis shows statistically significant positive correlations between employee performance and job satisfaction (r = 0.35), employee performance and life satisfaction (r = 0.28), life satisfaction and well-being (r = 0.33), and job satisfaction and well-being, whereas the correlation between well-being and work performance did not prove to be statistically significant. The qualitative component of the mixed-methods research design included systematic observation combined with one-to-one discussions. The

results indicated that job satisfaction and life satisfaction are more significant in determining work performance in sedentary jobs than employee well-being and that being unwell is still considered a sign of weakness; therefore, employees who are unwell do not want to expose themselves and refuse to cooperate in activities and studies about well-being. **Conclusions:** Further research examining the impact on work performance of organizational climate measurements in sedentary jobs is recommended.

Kosec et al. 2022.

Physical Activity

This month we explore workplace physical activity practices in real life, the barriers and facilitators to workplace physical activity and the effect of working from home on sports participation.

Is working from home during COVID-19 associated with increased sports participation? Contexts of sports, sports location and socioeconomic inequality

Background: Previous research has focused mainly on the association between working from home (WFH) and physical activity, establishing that physical activity diminished among people WFH during the COVID-19 pandemic. **Methods:** In our study, we investigated the association between WFH and specifically sports participation (competitive and non-competitive). We theorized that WFH would offer individuals additional opportunities to practice sports during the pandemic. Governmental restrictions at the time constrained opportunities to participate in organized sports and in sports with others. We, therefore, expected sports participation during the pandemic to be largely restricted to individual participation and participation at home or in the public space. **Results:** By means of descriptive analyses and adjusted analyses of variance ($n = 1506$), we found positive associations between WFH and various aspects of sports participation. Lower-educated individuals, in particular, seem to be benefiting from WFH related to their sports participation in the public space, and economically deprived individuals also seem to be benefiting from WFH in regard to their sports participation at home. **Conclusions:** Our findings extend the literature on physical activity and sports participation among people who worked from home during the COVID-19 pandemic while offering implications for policies on WFH, sports opportunities in public space and physical activity-friendly environments.

Grubben et al. 2022.

Workplace physical activity barriers and facilitators: A qualitative study based on employees physical activity levels

Background: Lack of time, management support, insufficient facilitates, workload balance, and culture are often reported as common barriers to physical activity (PA) participation in the workplace. In comparison, identifying facilitators of PA in the workplace are scarce. A 'one-size-fits-all' approach to overcoming the barriers may also be unsuccessful within university settings where multidisciplinary workforce exists due to the heterogeneity nature of job roles. Thus, the aim of this study was to understand the perceived barriers and facilitators of PA of university employees who were classified as active or inactive based on their job roles. **Methods:** Forty-one employees (female = 17; male = 24) participated in focus groups to discuss their perceived barriers and facilitators to PA in the workplace. Participants were categorised based on their PA levels as active and inactive prior analysing the semi-structured focus groups data via using thematic

analysis. **Results and discussion:** The results showed that a lack of time was reported by 80% of the participants as a barrier to PA, including 63% inactive and 17% of the active participants. This included 27% administrators' staff, 23% academics, 19% senior management, and 11% professional service staff. Over 75% participants reported a lack of management support as one of the perceived barriers to their PA engagement in the workplace. Approximately 58% also reported workplace culture as a barrier to PA participation. Open access to a gym on campus was perceived to be the main facilitator to engaging in PA in the future. Similarly, increased management support for engaging in PA and having flexibility during working days were perceived as facilitators for PA engagement and a way to reduced sedentary behaviour in the workplace. **Conclusions:** These findings contribute to the limited literature in terms of evaluating obstacles and facilitators of university employees to encourage engagement with PA in the workplace. These findings can be applied to form PA, health, and wellbeing-related interventions specifically targeting these identified barriers that are experienced in the workplace and thereby potentially reducing absenteeism and increasing productivity.

Workplace physical activity practices in real life: A scoping review of grey literature for small- and medium-sized enterprises

Background: There is a need to scale-up effective physical activity (PA) programmes for small- and medium-sized enterprises (SMEs), where the uptake of PA interventions is low. Identifying real-life workplace practices in PA could contribute to a better understanding of what PA programmes might be most grounded in the 'real world'. However, there is a scarcity of evidence showing what gets done. This study aimed to identify, describe and comprehensively summarize the real-life implementations of workplace PA initiatives, particularly in Europe, as a prior step to disseminating future feasible PA practices for SMEs. **Methods:** A scoping review of grey literature included a systematic search in the Google advanced search platform that permuted a combination of key concepts (PA, workplace, interventions/programmes), internet domains, and search operators in six different languages (Catalan, Finnish, French, Dutch, English and Spanish) between 2015 and November 2020. The analysis process was iterative, and multiple methods were used to sort, group and categorize the initiatives. **Results:** There were a total of 713 real-life workplace PA initiatives from different-sized organizations identified. These were categorized into five themes: active work and living, exercise and fitness programs, management and leadership, communication and dissemination, and facilities. Finally, feature trees showing a menu for real-life workplace PA practices were implemented. **Conclusions:** Identifying real-life practice providing a state-of-the-art snapshot of current PA practices in workplaces, which is a starting point to better understand feasible practices in the context of small- and medium-sized workplaces.

Musculoskeletal Health

This month we explore a range of work-related musculoskeletal health issues including the association between central sensitization-related symptoms and low back pain, and the prevalence

and risk factors for low back pain among a range of occupational groups. We also explore the relationship between job related stress and work-related upper extremity musculoskeletal disorders, and the moderating effect of job support, the level of disability and associated factors with a range of musculoskeletal disorders, and the factors associated with reduced risk of musculoskeletal disorders among office workers.

Associations of central sensitization-related symptoms with low back pain-related factors and work status in caregivers

Background: Low back pain (LBP) is associated with psychological factors and central sensitization-related symptoms (CSSs). The relationship between CSSs, LBP-related factors, and work status in caregivers remain unclear. **Methods:** This multicentre, collaborative, cross-sectional study aimed to determine the association between CSS severity, LBP-related factors, and work status in caregivers with LBP. We measured LBP intensity, pain duration, pain sites, CSSs (using the Central Sensitization Inventory-9: CSI-9), psychological factors (using the Pain Catastrophizing and Pain Self-Efficacy scales), and work status (interference, amount of assistance, frequency of assistance, and work environment) in 660 caregivers. CSS severity was categorised as no (CSI-9:0-9), mild (CSI-9:10-19), or moderate/severe (CSI-9:20-36). We further performed multiple comparison analyses and adjusted the residual chi-square to reveal differences between CSS severity groups. **Results:** Caregivers with more severe CSSs tended to exhibit worse LBP intensity ($p < 0.01$), widespread pain ($p < 0.01$), catastrophic thinking ($p < 0.01$), and pain self-efficacy ($p < 0.01$), and they also tended to experience work interference ($p < 0.01$). Caregivers without CSSs tended to receive a smaller amount of assistance with a lower frequency ($p < 0.05$). The number of participants with an adequate environment and equipment was significantly less in the moderate/severe CSS group ($p < 0.01$). **Conclusions:** Thus, our findings may suggest that CSS severity is associated with LBP intensity, widespread pain, psychological factors, and work status in caregivers.

Job-related stress associated with work-related upper extremity musculoskeletal disorders (UEMDs) in municipal waste collectors: The moderation and mediation effect of job support

Background: Since the policy of "keeping trash off of the ground" in Taiwan, long-term exposure to repetitive motion in waste collection process results in high risk of upper extremity musculoskeletal disorders (UEMDs). Thus, we assessed the moderation and mediation effects of job-related stress and job support on work-related UEMDs among municipal waste collectors. **Methods:** A cross-sectional study was conducted in two cities located at northern Taiwan during 2018-2019. 626 municipal waste collectors voluntarily participated and anonymously filled out a structured questionnaire. The moderation and mediation effects of effort-reward imbalance (ERI) and social support on UEMDs were analyzed by Haye's Process Macro Model. **Results:** Prevalence of UEMDs in municipal waste collectors were 43.4% for neck, 56.0% for shoulder, 24.1% for upper back, and 33.1% for hand/wrist. There was high prevalence of shoulder (72.2%), neck (48%), and upper back (30%) in female workers compared to male, most significantly in shoulders. In univariate and multivariate analysis, high ERI and low job support were significantly associated with ORs of 3.11 (95% CI:1.58-6.13) for elbow, 2.79 (95% CI:1.39-5.56) for shoulder, 3.39 (95% CI:1.64-7.00) for upper back and 3.83 (95% CI:1.98-7.41) for hand/wrist. Prevalent UEMDs were positively associated with high ERI in municipal waste collectors but negatively with job support. The moderation effects of ERI and job support on UEMDs, of which the measured synergy index exceeded one, were 18.24 for shoulder, 3.32 for elbow, and 2.45 for hand/wrist, but mediation effects were not significant. **Conclusions:** This study found municipal waste collectors with work-related upper extremity disorders were significantly associated with work-related psychological risk factors. Therefore, waste collection cannot only to be improved by semi-automatic and automatic processes but immediate intervention programs for the reduction of psychological risk factors is needed promptly.

Level of disability and associated factors with musculoskeletal disorders among supermarket cashiers
Background: This study aimed to determine the severity of symptoms and the level of disability or difficulty associated with MSDs in the neck, shoulders, upper limbs, lower back, and lower limbs as well as the factors associated with MSDs. **Material and methods:** This investigation collected demographic, health (*36-Item Short Form Survey* [SF-36]), and occupational related-factors for supermarket cashiers through the administration of several questionnaires, including the *Oswestry Disability Index* (ODI), *Disabilities of the Arm, Shoulder and Hand* (DASH), *Neck Disability Index* (NDI), *Lower Extremity Functional Scale* (LEFS), and *Numeric Rating Scale* (NRS) for pain. **Results:** One hundred ninety-three supermarket cashiers participated in this study. The mean scores for disability levels included NDI (M±SD 18.62±14.57), ODI (M±SD 20.74±13.89), DASH (M±SD 15.08±13.90), and LEFS (M±SD 63.06±14.24). Regression analyses demonstrated the existence of significant relationships between the experience of MSDs and several other factors, including the number of working days per week, the preferred working position, marital status and the need for awkward positions. **Conclusions:** The results indicate MSDs that signified a mild disability level among young participants. The number of working days per week, the preferred working position, the need to assume awkward positions, and marital status were significantly associated with MSDs. The findings indicated the need for preventive to avoid or minimize the prevalence of MSDs among supermarket cashiers. Int J Occup Med Environ Health. 2022;35(4):407-23.

Factors associated with reduced risk of musculoskeletal disorders among office workers: A cross-sectional study 2017 to 2020
Background: Prolonged sitting at work should be avoided to reduce the risks of either noncommunicable diseases (NCDs) or musculoskeletal disorders (MSDs) among office workers. A short duration of breaks in sitting every hour can reduce cardiometabolic risk factors contributing to NCDs. However, the recommendation for a break from sitting at work to reduce the risks of MSDs has not been identified. Therefore, this study aimed to determine whether breaking by changing position at work, physical activity, physical fitness, stress and sleep were associated with MSDs among office workers. **Methods:** A cross-sectional study was conducted from 2017 to 2020. Participants aged 20-59 years and using a computer at work ≥ 4 days/week were recruited. Data were collected using an online self-reporting questionnaire for computer users and 5 domains of physical fitness tests. Odds ratio (OR) with 95% confidence interval (CI) and multivariate logistic regression were used for statistical analysis. **Results:** Prevalence of MSDs was 37.9% (n = 207/545) and the most area of complaint were the neck, shoulders and back. A nonsignificant association between physical fitness and MSDs among office workers was obtained. After adjusting for age, sex, body mass index, and comorbidity, moderate-to-vigorous intensity physical activity (MVPA) ≥ 150 min/week and sitting at work ≥ 4 h/day were MSDs risk factors (OR = 1.57, 95%CI = 1.04-2.37). Frequently changing positions from sitting to standing or walking at work every hour could reduce the risks of MSDs by more than 30%. The risks of MSDs increased among office workers who commuted by staff shuttle bus and

personal car and had high to severe stress and slept < 6 h/day (1.6 to 2.4 times). **Conclusion:** Our findings indicated MVPA and prolonged sitting were MSD risk factors. We recommend office workers change position from sitting to standing or walking during work every hour and sleep ≥ 6 h/day to reduce risks of MSDs.

Prevalence and risk factors analysis for low back pain among occupational groups in key industries of China

Background: With the acceleration of industrialization and population aging, low back pain (LBP) has become the leading cause of life loss years caused by disability. Thus, it places a huge economic burden on society and is a global public health problem that needs urgent solution. This study aimed to conduct an epidemiological investigation and research on a large sample of workers in key industries in different regions of China, determine the incidence and distribution characteristics of LBP, explore the epidemic law, and provide a reference basis for alleviating global public health problems caused by LBP. **Methods:** We adopted a modified epidemiological cross-sectional survey method and a stratified cluster sampling method. All on-duty workers who fulfill the inclusion criteria are taken as the research participants from the representative enterprises in key industries across seven regions: north, east, central, south, southwest, northwest, and northeast China. The Chinese version of the musculoskeletal disease questionnaire, modified by a standardized Nordic questionnaire, was used to collect information, and 57,501 valid questionnaires were received. Descriptive statistics were used, and multivariate logistic regression analysis ($p < 0.05$) was performed to explore the association between musculoskeletal disorders and potential risk factors. **Results:** LBP annual incidence among workers in China's key industries is 16.4%. There was a significant difference in LBP incidence among occupational groups across different industries ($p < 0.05$). The multivariate regression model showed the following as risk factors for LBP: frequent repetitive movements with the trunk, working in the same positions at a high pace, trunk position, frequently turning around with your trunk, often working overtime, lifting heavy loads (i.e., more than 20 kg), education level, staff shortage, working age (years), cigarette smoking, use of vibration tools at work, body mass index, lifting heavy loads (i.e., more than 5 kg), and age (years). Physical exercise, often standing at work, and absolute resting time were protective factors. **Conclusion:** LBP incidence among key industries and workers in China is high. Thus, it is urgent to take relevant measures according to the individual, occupational, and psychosocial factors of LBP to reduce the adverse impact of LBP on workers' health.