



Australian Government

Comcare

Emerging Evidence Alert

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This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics. It provides a review of recent journal articles and relevant content related to Comcare's five research themes: Fostering Work Participation; Building Employer Capability; Adapting to the Future of Work; Guiding and Supporting Mental Health and Wellbeing; and Enabling Healthy and Safe Workplaces. Collated articles were published in January 2022 only.

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Monthly research highlight

Improving work and organisational conditions can help prevent worker burnout

Improving work and organisational conditions can help prevent burnout, a [study](#) of Malaysian public healthcare workers during the COVID-19 pandemic has shown.

Burnout is increasingly being recognised globally as a major occupational health concern, and one that has been exacerbated by the COVID-19 pandemic and the pressures it has placed on healthcare systems worldwide.

Defined as a “protracted response to persistent emotional and interpersonal pressure encountered in the workplace” (Fahra et al., 2022), burnout comprises multiple facets, including emotional exhaustion and disengagement from work. In healthcare workers, who are a high-risk group for burnout, it can have negative effects on their psychological and physical health. If not managed properly, it can also lead to negative organisational consequences including job dissatisfaction, absenteeism, reduced job performance, poor quality of care, and impaired patient safety.

The results indicate that rates of burnout amongst the studied public healthcare workers reached as high as 45% during the pandemic and were associated with the following workplace factors:

- High emotional demands of jobs
- Lower role clarity
- Lower job satisfaction
- Low organisational justice (i.e. perceptions of fairness of work)

The length of time a health worker was involved in working in responding to the COVID-19 pandemic also predicted burnout, with longer periods leading to higher burnout. The study highlights the need for management to look at risk mitigation strategies in the workplace and early interventions targeted at supporting workers. It recommends providing appropriate psychosocial supports such as psychological first aid and employee assistance programs as a way to mitigate the impacts of burnout.

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

For resources on how to improve psychological health and safety at work, visit [People at Work](#).



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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

This month's articles focus on the predictors for long term return to work outcomes following prostate surgery and a critical review of the relationship between alcohol consumption and sickness absence.

Return to Work

Long-term outcomes among localized prostate cancer survivors: prospective predictors for return-to-work three years after cancer rehabilitation

Background: This study aimed at (1) investigating the work status of men treated by radical prostatectomy due to diagnosis of localized prostate cancer (LPCa) three years after having attended a cancer rehabilitation program and (2) identifying prospective risk factors for not working at this time point.

Methods: In a longitudinal, questionnaire-based multicenter study, 519 working-age LPCa survivors reported on their work status 12 and 36 months following rehabilitation. Chi-square tests/t tests and multivariable logistic regression analysis were used to identify prospective factors associated with not working at 36 months follow-up. **Results:** Nearly three quarter of LPCa survivors (N = 377, 73%) worked 3 years after post-acute rehabilitation. Most participants (N = 365, 71%) showed continuous return-to-work (RTW) patterns as they worked both 1 and 3 years following rehabilitation. Multivariable regression analysis revealed older age, low or middle socio-economic status as well as resigned and unambitious work behavior and fatigue at the time of attending the rehabilitation program to be prospective factors for not working at 36 months follow-up. Low socio-economic status [Odds ratio (OR) 4.81, 95% confidence interval (CI) 2.07-11.16] and unambitious work behavior [OR 4.48, 95% CI 2.16-9.31] were the strongest predictors. **Conclusion:** Long-term work retention is a realistic goal among LPCa survivors. The results contribute to the identification of at-risk LPCa survivors early in the RTW process. Special attention should be paid to social inequality. Further, interventions related to the management of fatigue and work-related coping styles could improve long-term RTW, as these were relevant, but potentially modifiable factors impeding work retention.

Ullrich et al. 2022.

Support Care in Cancer, vol. 30, no. 1.

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Keywords: Employment; Long term; Prostate cancer; Rehabilitation; Return to work; Survivorship

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs00520-021-06376-6>

Presenteeism and Absenteeism

A systematic review and meta-analysis uncovering the relationship between alcohol consumption and sickness absence. When type of design, data, and sickness absence make a difference

Background: Earlier research has revealed a strong relationship between alcohol use and sickness absence. The aim of this review was to explore and uncover this relationship by looking at differences in type of design (cross-sectional vs. longitudinal), type of data (self-reported vs. registered data), and type of sickness absence (long-term vs. short term). **Method:** Six databases were searched through June 2020. Observational and experimental studies from 1980 to 2020, in English or Scandinavian languages reporting the results of the association between alcohol consumption and sickness absence among working population were included. Quality assessment, and statistical analysis focusing on differences in the likelihood of sickness absence on subgroup levels were performed on each association, not on each study. Differences in the likelihood of sickness absence were analyzed by means of meta-analysis. PROSPERO registration number: CRD42018112078. **Results:** Fifty-nine studies (58% longitudinal) including 439,209 employees (min. 43, max. 77,746) from 15 countries were included. Most associations indicating positive and statistically significant results were based on longitudinal data (70%) and confirmed the strong/causal relationship between alcohol use and sickness absence. The meta-analysis included eight studies (ten samples). The increased risk for sickness absence was likely to be found in cross-sectional studies (OR: 8.28, 95% CI: 6.33-10.81), studies using self-reported absence data (OR: 5.16, 95% CI: 3.16-8.45), and those

reporting short-term sickness absence (OR: 4.84, 95% CI: 2.73-8.60). **Conclusion:** This review supports, but also challenges earlier evidence on the association between alcohol use and sickness absence. Certain types of design, data, and types of sickness absence may produce large effects. Hence, to investigate the actual association between alcohol and sickness absence, research should produce and review longitudinal designed studies using registry data and do subgroup analyses that cover and explain variability of this association.

Hashemi et al. 2022.

PLoS One, vol. 17, no. 1.

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Keywords: Alcohol; Sickness; Absenteeism

Evidence Level: 1A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0262458>

Building Employer Capability

In this section studies explore employees' perspectives on why ineffective programs continue to be implemented in the workplace, the effect of perceived organizational support on psychological capital and whether employer-provided time off work actually encourages staff to participate in continuing vocational education and training. Studies have also explored the effect of shift work on pregnancy, cardiovascular disease risk, cancer risk, psychiatric treatment, sex hormone production and sleep deprivation, as well as the effectiveness of an intervention to support recovery from irregular work hours. Work ability related to physical and psychosocial working conditions at work, and following obesity surgery and burn injuries are also explored.

Wellness Programs

"It's good to feel like you're doing something": a qualitative study examining state health department employees' views on why ineffective programs continue to be implemented in the USA

Background: Mis-implementation, the inappropriate continuation of programs or policies that are not evidence-based or the inappropriate termination of evidence-based programs and policies, can lead to the inefficient use of scarce resources in public health agencies and decrease the ability of these agencies to deliver effective programs and improve population health. Little is known about why mis-implementation occurs, which is needed to understand how to address it. This study sought to understand the state health department practitioners' perspectives about what makes programs ineffective and the reasons why ineffective programs continue. **Methods:** Eight state health departments (SHDs) were selected to participate in telephone-administered qualitative interviews about decision-making around ending or continuing programs. States were selected based on geographic representation and on their level of mis-implementation (low and high) categorized from our previous national survey. Forty-four SHD chronic disease staff participated in interviews, which were audio-recorded and transcribed verbatim. Transcripts were consensus coded, and themes were identified and summarized. This paper presents two sets of themes, related to (1) what makes a program ineffective and (2) why ineffective programs continue to be implemented according to SHD staff. **Results:** Participants considered programs ineffective if they were not evidence-based or if they did not fit well within the population; could not be implemented well due to program restraints or a lack of staff time and resources; did not reach those who could most benefit from the program; or did not show the expected program outcomes through evaluation. Practitioners described several reasons why ineffective programs continued to be implemented, including concerns about damaging the relationships with partner organizations, the presence of program champions, agency capacity, and funding restrictions. **Conclusions:** The continued implementation of ineffective programs occurs due to a number of interrelated organizational, relational, human resources, and economic factors. Efforts should focus on preventing mis-implementation since it limits public health agencies' ability to conduct evidence-based public health, implement evidence-based programs effectively, and reduce the high burden of chronic diseases. The use of evidence-based decision-making in public health agencies and supporting adaptation of programs to improve their fit may prevent mis-implementation. Future work

should identify effective strategies to reduce mis-implementation, which can optimize public health practice and improve population health.

Mazzucca et al. 2022.

Implementation Science Communications, vol. 3, no. 1.

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Keywords: Evidence-based; Mis-implementation; Work programs

Evidence Level: 5B

Link: <https://implementationsciencecomms.biomedcentral.com/articles/10.1186/s43058-021-00252-4>

Organisational Issues

Flourishing in the workplace: A one-year prospective study on the effects of perceived organizational support and psychological capital

Background: People working in urban areas often experience various work-related stressors, such as long working hours, high work pressure, and work-life interference, which can lead to severe mental and physical consequences. Identification of the protective factors that enable employees to flourish and thrive is especially important. The present study aims to identify the organizational and personal resources that contribute to employee flourishing. Adopting the conservation of resources theory and organizational support theory, it was hypothesized that perceived organizational support (POS) would promote employee flourishing through increasing psychological capital (PsyCap). **Methods:** A prospective study was conducted on a sample of 400 working adults from the social and personal services industry in Hong Kong. Data were collected at baseline, three months, and one year. Both Diener's composite model of flourishing and Seligman's PERMA model of flourishing were tested. **Results:** Structural equation modeling showed that PsyCap at three months significantly mediated the effects of POS at baseline on flourishing and all dimensions of PERMA (positive emotion, engagement, relationships, meaning, accomplishments) at one year. **Discussion:** Findings suggest that PsyCap underlies the process through which POS influences flourishing, whereby the promotion of positive psychological resources in a nurturing and supportive organization contributes to psychosocial functioning in the long run.

Ho et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: PERMA; Flourishing; Perceived organizational support; Psychological capital; Well-being

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/19/2/922>

Job Design

On the effect of employer offered leave of work on participation in continuing vocational education and training - Investigating the intention-behavior relation

Background: The availability of time is a deciding factor for participation of adults in continuing vocational education and training (CVET). In view of the importance of time for participation, the present study investigates the impact of employer offered leave of work on employees' participation behavior in CVET. Leave of work provides a specific timeframe for CVET by enabling the use of working time as learning time. The rationale of the intention-behavior relation as theorized by the theory of planned behavior provides the theoretical framework for the study. The theory allows the integration of individual and contextual factors (e.g., the work environment) in explaining individual behavior and the underpinning decision-making process. The theory conceptualizes time as an element of behavioral control that is required to act on an intention. Behavioral control is theorized to moderate the intention-behavior relation. **Methods:** Two modes of behavioral control are distinguished. We use employer offered leave of work as a proxy for actual behavioral control and the degree of perceived behavioral control regarding the availability of temporal resources to participate in CVET to investigate the theorized moderating role of behavior control on the

intention-behavior relation. To test the hypotheses, two waves of panel data from the German National Educational Panel Study (NEPS) are used. Aiming at causal inferences, hybrid logit models are employed. **Results:** We find that a participation intention is a significant predictor of CVET participation. However, the results provide no evidence regarding the theorized moderating role of actual behavioral control in terms of an employer offered leave of work on the intention-behavior relation. Furthermore, the results provide evidence that the degree of perceived behavioral control regarding the availability of temporal resources to participate in CVET does neither moderate the intention-behavior relation nor is a proxy for actual behavioral control. **Discussion:** Finally, we discuss possible future developments of the theory of planned behavior by integrating action-theoretical assumptions from the value-expectancy theory.

Rüter 2022.

Frontiers in Psychology, vol. 7.

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Keywords: Continuing vocational education and training; Hybrid logit models; Intention-behavior relation; Leave of work; Panel analysis; Time

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.807809/full>

Shift Work

Changes in melatonin and sex steroid hormone production among men as a result of rotating night shift work - the HORMONIT study

Background: Data from real world settings on circadian disruption and subsequent hormone-related changes may explain the higher risk of hormone-dependent cancers among night shift workers. The present study examines the melatonin and sex steroid hormone levels among night shift workers. **Methods:** We included 44 male, rotating shift workers from a car factory in Spain, sampled both at the end of a 3-week night shift (22:00-06:00 hrs) and a 3-week early morning shift (06:00-14:00 hrs). Participants collected all urine voids over 24-hours during each shift. Urinary concentrations of sex steroid hormones (estrogens, androgens and progestogens) and 6-sulfatoxymelatonin (aMT6s, major melatonin metabolite) were determined. Individual cosinor analysis was used to derive the acrophase (peak time) and area under the curve (total production). Linear mixed models examined intraindividual associations between night shift work and log-transformed 24-hour peak time and total production of hormones compared to early morning shift work. **Results:** The acrophase was delayed during the night shift for aMT6s [geometric mean difference (GMD) 7.53 hrs, 95% confidence interval (CI) 4.46-10.60], androgens (eg, testosterone: GMD 6.83 hrs, 95% CI 0.34-13.32) and progestogens (eg, 17-hydroxyprogesterone: GMD 4.54 hrs, 95% CI 2.92-6.16) compared to the early morning shift. We found a higher production of adrenal androgen 11-oxoandrosterone/11-oxoetiocholanolone [geometric mean ratio (GMR) 1.43, 95% CI 1.12-1.81], and a lower production of adrenal progestogen 16-cysteinyprogesterone (GMR 0.79, 95% CI 0.67-0.93) during the night shift compared to the early morning shift levels. **Conclusions:** Night shift work was associated with melatonin and sex hormone-related changes in timing and total production, providing insight into the mechanistic path for its association with hormone-dependent cancer.

Harding et al. 2022.

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

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Keywords: Night shift; Circadian disruption; Sex steroid hormone production; Melatonin

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/3991>

Shift and night work during pregnancy and preterm birth-a cohort study of Swedish health care employees

Background: Previous studies of preterm birth (PTB) concerning night work have been inconclusive and partly limited by imprecise data on working schedules. This study investigated the risk of PTB in relation to detailed, registry-based data on working hours. **Methods:** In a register-based prospective cohort study, we

identified 4970 singleton births with information on PTB from the Swedish Medical Birth Register of health care employees in Stockholm. Day-by-day information on working hours 2008-16 was obtained from a computerized employee register. Odds ratios (ORs) of PTB according to work hour characteristics were analysed by logistic regression adjusted for mother's age, stature, body mass index (BMI), parity, smoking habits, education, profession and country of birth. **Results:** There was an increased risk of PTB among those who frequently worked night shifts (>25 times) [OR, 1.62; 95% confidence interval (CI), 1.03-2.53] and who ever worked ≥ 3 consecutive night shifts (OR, 1.43; 95% CI, 1.03-1.99) during the first trimester. Frequently (> 8 times) working 3 or more consecutive nights, and frequently (>18 times) having quick returns from night shifts (<28 h) during the first trimester showed 3-4 fold increased risk of PTB. Moreover, working frequent (>20 times) long shifts (≥ 10 h) (OR 1.63; 95% CI, 1.07-2.49) during the first trimester and working any Week >40 h (OR 2.05; 95% CI, 1.31-3.22) during the third trimester were associated with PTB.

Conclusions: In this cohort of Swedish health care employees with registry-based data on working hours, night work, especially working frequent consecutive nights, and quick returns from night shifts during the first trimester were associated with increased risk of PTB among pregnant women.

Kader et al. 2022.

International Journal of Epidemiology, vol. 50, no. 6.

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Keywords: Birth outcome; Long shifts; Pregnancy; Preterm delivery; Shift work; Working hours

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8743126/>

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

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

Methods: Full-time employees who participated in the Danish Labor Force Survey sometime in the period 2000-2013 (N=131 321) were followed for up to five years in national registers for redeemed prescriptions and psychiatric hospital treatment. The analyses were controlled for sex, age, weekly working hours, calendar time of the interview and socioeconomic status. **Results:** We detected 15 826 cases of psychotropic drug use in 521 976 person-years at risk and 1480 cases of hospitalization in 636 673 person-years at risk. The rate ratio (RR) for psychotropic drugs was estimated to be 1.09 [99% confidence interval (CI) 1.02-1.16] for night-shift versus no night-shift work. The corresponding RR for psychiatric hospital treatment was 1.11 (95% CI 0.95-1.29). The odds of redeeming a prescription for antidepressants rather than anxiolytics was independent of night-shift work: 1.09 (95% CI 0.96-1.24), and we found no interaction effect between night-shift work and working hours (P=0.26). **Conclusion:** As it appears in the general working population in Denmark, night-shift work is not an important predictor of mental ill health.

Albertsen et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 10.

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Keywords: Night shift; Work; Psychiatric; Medicine; Anxiety; Mood; Stress

Evidence Level: 4B

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

A simulated shift work schedule does not increase DNA double-strand break repair by NHEJ in the Drosophila Rr3 System

Background: Long-term shift work is widely believed to increase the risk of certain cancers, but conflicting findings between studies render this association unclear. Evidence of interplay between the circadian clock, cell cycle regulation, and DNA damage detection machinery suggests the possibility that circadian rhythm disruption consequent to shift work could alter the DNA double-strand break (DSB) repair pathway usage to favor mutagenic non-homologous end-joining (NHEJ) repair. **Methods:** To test this hypothesis, we compared relative usage of NHEJ and single-strand annealing (SSA) repair of a complementary ended

chromosomal double-stranded break using the Repair Reporter 3 (Rr3) system in *Drosophila* between flies reared on 12:12 and 8:8 (simulated shift work) light:dark schedules. **Results:** Actimetric analysis showed that the 8:8 light:dark schedule effectively disrupted the rhythms in locomotor output. Inaccurate NHEJ repair was not a frequent outcome in this system overall, and no significant difference was seen in the usage of NHEJ or SSA repair between the control and simulated shift work schedules. **Discussion:** We conclude that this circadian disruption regimen does not alter the usage of mutagenic NHEJ DSB repair in the *Drosophila* male pre-meiotic germline, in the context of the Rr3 system.

Bergerson et al. 2022.

Genes (Basel), vol. 13, no. 1.

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Keywords: DNA repair; *Drosophila*; NHEJ; Circadian rhythm; Mutation

Evidence Level: 5B

Link: <https://www.mdpi.com/2073-4425/13/1/150>

Night and shift work and incidence of cerebrovascular disease - a prospective cohort study of healthcare employees in Stockholm

Background: This study aimed to investigate the effects of various aspects of night and shift work regarding incident cerebrovascular disease (CeVD). **Methods:** The cohort included 26 667 women and 3793 men (nurses and nursing assistants) who were employed for at least one year 2008-2016 in Region Stockholm, Sweden. Information about the cohort and working hours were obtained from a computerized employee-register and diagnoses were retrieved from national and regional registers. We used discrete time proportional hazard models to assess the risk of CeVD (2009-2017), in relation to work hour characteristics, adjusting for sex, age, country of birth, education and profession. **Results:** We observed an excess risk of CeVD (N=223) among employees who, during the preceding year, worked night shifts >30 times [hazard ratio (HR) 1.44, 95% confidence interval (CI) 1.04-1.99] or ≥3 consecutive night shifts >15 times (HR 1.69, 95% CI 1.18-2.42) or with >30 quick returns (<28 hours) from night shifts (HR 1.52, 95% CI 1.10-2.10) compared to those who did not work nights. We also observed an excess risk among employees with a long duration (>5 years) of exposure to night shift work (HR 1.87, 95% CI 1.27-2.77), all supported by a dose-response pattern. **Conclusions:** Our results show that the risk of CeVD among nurses and nursing assistants is associated with night shift work. The number of years with night shift work, the frequency of night shifts per year, the frequency of consecutive night shifts, and short recovery after night shifts influenced the risk. Work schedules aiming at minimizing these aspects of night shift work may reduce the risk.

Bigert et al. 2022.

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

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Keywords: Shift work; Night shift; Cerebrovascular disease; Healthcare; Sweden

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/3986>

Randomised control trial of a proactive intervention supporting recovery in relation to stress and irregular work hours: effects on sleep, burn-out, fatigue and somatic symptoms

Background: To examine if a proactive recovery intervention for newly graduated registered nurses (RNs) could prevent the development of sleep problems, burn-out, fatigue or somatic symptoms. **Methods:** The study was a randomised control trial with parallel design. Newly graduated RNs with less than 12 months' work experience were eligible to participate. 461 RNs from 8 hospitals in Sweden were invited, of which 207 signed up. These were randomised to either intervention or control groups. After adjustments, 99 RNs were included in the intervention group (mean age 27.5 years, 84.7% women) and 108 in the control group (mean age 27.0 years, 90.7% women). 82 RNs in the intervention group attended a group-administered recovery programme, involving three group sessions with 2 weeks between each session, focusing on proactive strategies for sleep and recovery in relation to work stress and shift work. Effects on sleep, burn-out, fatigue and somatic symptoms were measured by questionnaires at baseline, postintervention and at 6 months follow-up. **Results:** Preventive effect was seen on somatic symptoms for the intervention group. Also, the intervention group showed less burn-out and fatigue symptoms at postintervention. However,

these latter effects did not persist at follow-up. Participants used many of the strategies from the programme. **Conclusions:** A proactive, group-administered recovery programme could be helpful in strengthening recovery and preventing negative health consequences for newly graduated RNs.

Dahlgren et al. 2022.

Occupational and Environmental Medicine, vol. 24.

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Keywords: Burnout; Fatigue; Occupational health; Preventive medicine; Psychological; Sleep

Evidence Level: 2A

Link: <https://oem.bmj.com/content/early/2022/01/23/oemed-2021-107789.long>

Social jetlag and sleep debts are altered in different rosters of night shift work

Background: Night and shift work are suspected to cause various adverse effects on health and sleep. Sleep deprivation through shift work is assumed to be compensated on free days. So far it is not clear how different shift systems and shift lengths affect sleep structure on work and free days. Especially working night shifts disrupts the circadian rhythm but also extended working hours (12h) might affect sleep characteristics. Hitherto, the magnitude of sleep debt, social jetlag, and Locomotor Inactivity During Sleep (LIDS) in different shift systems is unknown. **Methods:** Here, we investigated the impact of five different shift rosters on sleep in 129 industrial workers from Germany. Permanent night work with multiple shift systems with and without night shifts and with different shift lengths were compared. Wrist-activity was monitored over 28 days revealing sleep on- and offsets as well as LIDS as proxy for sleep quality. Overall, 3,865 sleep bouts comprising 22,310 hours of sleep were examined. **Results:** The mean daily age-adjusted sleep duration (including naps) was 6:43h and did not differ between shift workers of different rosters. However, sleep duration on workdays was particularly low in rotational shift systems with 12h-shifts (5:00h), while overall sleep debt was highest. Shift workers showed a median absolute social jetlag of 3:03h, which differed considerably between shift types and rosters ($p < 0.0001$). Permanent night workers had the highest social jetlag (5:08h) and latest mid-sleeps on workdays and free days. Sleep quality was reduced in permanent night shift workers compared with shift workers in other rosters and differed between daytime and nighttime sleep. **Conclusions:** Shift work leads to partial sleep deprivation, which particularly affects workers in 12h-shifts and permanent night shifts. Working these shifts resulted in higher sleep debts and larger absolute social jetlag whereas sleep quality was especially reduced in permanent night shift workers compared with shift workers of other rosters.

Casjens et al. 2022.

PLoS One, vol. 17, no. 1.

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Keywords: Sleep; Jetlag; Sleep debts; Night shift; Work

Evidence Level: 5B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0262049>

Work Ability

Physical and psychosocial working conditions as predictors of 5-year changes in work ability among 2078 employees in Germany

Background: To examine 5-year prospective associations between working conditions and work ability among employees in Germany. **Methods:** A cohort study (2011/2012-2017), based on a random sample of employees in employments subject to payment of social contributions aged 31-60 years (Study on Mental Health at Work; S-MGA; $N = 2,078$), included data on physical and quantitative demands, control (influence, possibilities for development, control over working time), relations (role clarity and leadership quality) and work ability (Work Ability Index, WAI; subscale 'subjective work ability and resources'). Data were analysed using linear regression. **Results:** Physical demands and control were associated with small 5-year changes in work ability ($\Delta R^2 = 1\%$). Among the subgroup of employees with ≥ 25 sickness days, possibilities for development, control and quality of leadership were associated with changes in work ability ($\Delta R^2 = 8\%$).

Conclusions: The impact of working conditions on long term changes in work ability seems to be negligible. However, in vulnerable subpopulations experiencing poor health, working conditions may be associated to a larger extent to work ability over this time span.

Burr et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 1.

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Keywords: COPSOQ; Physical demands; Prospective study; Psychosocial risk factors

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01716-9>

Activity impairment, work status, and work productivity loss in adults 5-7 years after burn injuries

Background: An important aspect of the rehabilitation of burn patients is social participation, including daily activities and work. Detailed information on long-term activity impairment and employment is scarce. Therefore, we investigated activity impairment, work status, and work productivity loss in adults 5-7 years following burn injuries, and investigated associations with burn-specific health-related quality of life (HRQL) domains. **Methods:** Adult participants completed the Work Productivity and Activity Impairment General Health questionnaire and the Burn Specific Health Scale-brief (BSHS-B) 5-7 years post-burn. Outcomes were compared between participants with mild/intermediate and severe burns (>20% total body surface area burned). **Results:** Seventy-six (36%) of the 213 participants experienced some degree of activity impairment due to burn-related problems 5-7 years post-burn. Seventy percent of the population was employed; 12% of them experienced work productivity loss due to burn-related problems. Nineteen percent reported changes in their work situation (partly) because of the burn injury. A higher proportion of participants with severe burns had activity impairments (56% vs 29%; $P = .001$) and work productivity loss (26% vs 8%; $P < .001$) compared to participants with mild/intermediate burns. **Discussion:** Activity impairment and work productivity loss were both associated with burn-related work problems and lower mood, measured with the BSHS-B. In **conclusion**, a substantial part of the study population experienced activity impairment and work productivity loss, was unemployed, and/or reported changes in their work situation due to their injury. Particularly patients with severe burns reported productivity loss and had lower employment rates. This subscribes the importance of addressing work-related functioning in the rehabilitation of burn patients.

Spronk et al. 2022.

Journal of Burn and Care Research, vol. 43, no. 1.

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Keywords: Work status; Productivity; Burn; Injuries

Evidence Level: 5A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8737115/>

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

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

Results: Participants (82% of whom were women) were middle-aged and showed a BMI of nearly 46 at the preoperative medical examination. Excess weight loss at (t2) and at (t3) was 49 and 66%, respectively. Work ability increased toward a moderate level after weight-loss surgery. Work ability and dysfunctional

eating at (t1) showed significant predictive value with respect to work ability at (t3). **Discussion:** The results suggest that weight-loss surgery has a positive impact on work ability, and indicate a predictive value for the extent of weight loss and dysfunctional eating behavior. Against our hypothesis and in contrast to former research, a predictive value for depressive symptoms and age was not revealed. Further research must show how interventions can support and maintain improvements in work ability after bariatric surgery, in order to reduce sick leave and unemployment in patients with preoperative morbid obesity.

Köhler et al. 2022.

Obesity Facts, vol. 15, no. 1.

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

Evidence Level: 4A

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

Adapting to the Future of Work

In this section, studies have explored the work-related factors which influenced older workers' decision to retire, including the quality of their work community and the combination of job demands and job control. In the area of technology at work, one study explored the effect of technology on job loss risk and disability and another study explored the effect of technostress inhibitors on employee wellbeing.

Aging Workforce

Recent UK retirees' views about the work-related factors which influenced their decision to retire: a qualitative study within the Health and Employment After Fifty (HEAF) cohort

Background: Lower birth rates and increasing longevity have resulted in ageing populations in European countries. These demographic changes place challenges on pension provision as numbers of those who are economically inactive and retired increase relative to those in paid work. Therefore, governments need workers to postpone retirement and work to older ages. Whilst health and wealth are important in retirement decision-making, considerably less is known about the effects of workplace factors. The aim of this study was to explore the views of recent UK retirees about the role that work-related factors played in their decision to retire. **Methods:** This qualitative study was nested within the Health and Employment After Fifty (HEAF) cohort. People who had retired 3-6 years previously (not for health reasons) were purposively sampled to obtain the views of men and women from a range of socio-economic backgrounds and jobs. Semi-structured interviews were carried out by telephone using a pre-defined topic guide. Interviews were audio-recorded, transcribed and analysed thematically. **Results:** Seventeen interviews were conducted. Thematic analysis showed that retirement decisions were complex and multi-factorial but that work-related factors contributed to decision-making in two main ways. First, some work factors pushed participants towards retirement. These were perceptions that: workplace change had affected the way they were valued or increased pressure on them; work demands, including commuting, had intruded excessively on personal time, effects that were exacerbated by modern technology; work was draining, isolating or under-appreciated; and /or that work was causing physical strain or discomfort relative to their perception of their capacity. In contrast, work factors could also cause participants to pull back towards work, particularly: autonomy; supportive work colleagues; a sense of being appreciated; and perceived job flexibility. **Conclusions:** Recent retirees explained that their decision to retire was multi-factorial but work-related factors contributed importantly. Potentially, employers could: review workers' perceptions about their work; their capacity in relation to job demands; increase flexibility; and facilitate a supportive work community to encourage longer working lives.

Stevens et al. 2022.

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

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Keywords: Ageing; Retirement; Work

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-12541-1>

Quality of work community and workers' intention to retire

Background: To study the workers' perception of the quality of work community and its association with intention to retire early, separately among women and men working in Finnish postal service. **Methods:** A questionnaire survey was sent to all Finnish postal services employees aged ≥ 50 years in 2016 and 44% ($n = 2096$) replied to the survey (mean age 56.3, 40% women). Employees' intention to retire before statutory retirement was measured on a scale of 1-5 and dichotomized. The quality of work community was defined by four composite variables: equality at work, flexibility at work, supportive work environment and health or other reason and trichotomized by their tercile values. Odds ratio (ORs) and their 95% confidence intervals (CIs) for associations of quality of work community with intention to retire were calculated separately for men and women using log binomial regression models adjusted for potential confounders. **Results:** About one-third of respondents intended to retire early with no significant gender difference in retirement intention. Low equality at work (women OR 2.77, 95% CI 1.60-4.81; men 2.84, 1.80-4.48) and low flexibility at work (women 3.30, 1.94-5.60; men 2.91, 1.88-4.50) was associated with higher likelihood of intention to retire. Among women intention to retire was found less likely due to low supportive work environment (0.52, 0.31-0.89) and among men due to intermediate health or other reason (0.65, 0.43-0.98). **Conclusion:** The results highlight the importance of the quality of work community as well as the promotion of work-related health in order to encourage employees to remain at workforce for longer.

Neupane et al. 2022.

International Archives of Occupational and Environmental Health, vol. 7, no. 1-10.

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Keywords: Older workers; Postal service; Psychosocial factors; Retirement intention; Work environment

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01826-4>

Associations between combinations of job demands and job control among 616,818 people aged 55-64 in paid work with their labour market status 11 years later: a prospective cohort study

Background: Given current discussions about extending working lives, more knowledge is needed on working conditions associated with labour market status in older age. **Objective:** To explore associations between combinations of job demands and job control among workers aged 55-64 years and their labour market status 11 years later. **Methods:** A population-based prospective cohort study using nationwide register data. The 616,818 individuals in Sweden aged 55-64 who in 2001 were in paid work were categorised using a job exposure matrix based on tertiles (reference = medium control/medium demands). Participants were followed up in 2012 regarding their main labour market status (paid work, old-age pension, no income/social assistance, sickness absence/disability pension, emigrated, dead; reference = old-age pension) using multinomial logistic regression for odds ratios (OR) and 95% confidence intervals (CI). The fully adjusted analyses included adjustment for sociodemographic factors and unemployment or sickness absence/disability pension for more than half the year in 2001. **Results:** Those in occupations with low job control at baseline were less likely to be in paid work at follow-up (OR low demands/low control 0.74, CI 0.71-0.78; high demands/low control 0.81, CI 0.75-0.87). Those in occupations with baseline high demands were less likely to have no income/social assistance at follow-up (OR high demands/low control 0.71, CI 0.52-0.96; high demands/high control 0.59, CI 0.47-0.75). **Conclusion:** Job demands and control when aged 55-64 were associated with labour market status 11 years later: high control was associated with greater chance of being in paid work, and high demands were associated with lower risk of no income/social assistance.

Farrants et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 1.

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Keywords: Extending working lives; Job control; Job demands; Psychosocial working environment

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01717-8>

Technology

Technology-induced job loss risk, disability and all-cause mortality in Norway

Background: Ongoing shifts in economic structure from automation and globalisation can affect employment and mortality, yet these relations are not well described. **Objective:** We assess whether long-term employment and health outcomes relate systematically to structural change in the labour market, using the occupational Routine Task Intensity (RTI) score as indicator of exposure to risks of outsourcing and technology-induced job loss. **Methods:** Using a cohort design and administrative data with national population coverage, we categorise all Norwegian employees in 2003 by the RTI score of their occupation and examine how this score correlates with employment and health outcomes measured in 2018 and 2019. The study sample counts 416 003 men and 376 413 women aged 33-52 in 2003. **Results:** The occupational RTI score at baseline is robustly associated with long-term employment, disability and mortality outcomes. Raw correlations are reduced after adjustment for potential confounders, but associations remain substantial in models controlling for individual covariates and in sibling comparisons. Working in an occupation with RTI score 1 SD above the mean in 2003 is associated with a raised probability of being deceased in 2019 of 0.24 percentage points (95% CI: 0.18 to 0.30) for men and 0.13 percentage points (95% CI: 0.02 to 0.24) for women, corresponding to raised mortality rates of 6.7% and 5.5%. **Conclusions:** Individuals in occupations characterised by high routine intensity are less likely to remain employed in the long term, and have higher rates of disability and mortality.

Bratsberg et al. 2022.

Occupational and Environmental Medicine, vol. 79, no. 1.

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Keywords: Disability; Longitudinal studies; Mortality

Evidence Level: 4B

Link: <https://oem.bmj.com/content/79/1/32.long>

The moderating effects of technostress inhibitors on techno-stressors and employee's well-being

Background: This study determined the effects of techno-stressors on employees' well-being. It also determined the moderating role of technostress inhibitors in techno-stressors and employees' well-being. **Methods:** We employed a time-lagged design and self-administered survey method to collect data from banking employees. **Results:** We retrieved 355 usable responses. The results showed that techno-stressors significantly and negatively affected employees' well-being. Technostress inhibitors significantly and positively affected the employee's well-being. The moderating effects of techno-stressors and technostress inhibitors showed that six of nine moderating effects were significant and positive. **Discussion:** The results implied that technostress inhibitors help to improve employees' well-being. In the end, we present some implications for theory and practice.

Hang et al. 2022.

Frontiers in Psychology, vol. 12.

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Keywords: Employees performance; Health psychology; Occupational health psychology; Techno-stressors; Technostress inhibitors; Well-being

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.821446/full>

Guiding and Supporting Mental Health and Wellbeing

In this section, factors associated with poor mental health in factory workers and airline cabin crews and burnout among the public health workforce during the COVID-19 pandemic are explored. Workplace related psychosocial issues related to family-to-work enrichment associations, job insecurity and the relationship between psychosocial work factors and blood pressure are presented.

Mental Health

Factors associated with symptoms of poor mental health among women factory workers in China's supply chain

Background: Foreign direct investment (FDI) to China has motivated increased labor migration to export processing zones (EPZs). Work environments with high occupational stress, such as production line jobs typical in EPZs, have been associated with adverse mental health symptoms. **Methods:** A cross-sectional survey that examined occupational stress and symptoms of poor mental health was implemented among Chinese women factory workers in three electronic factories in the Tianjin Economic-Technological Development Area. Symptoms of mental health measured in the survey were hopelessness, depression, not feeling useful or needed, and trouble concentrating. Crude and adjusted prevalence odds ratios and their 95% confidence intervals were calculated with logistic regression. **Results:** Responses were collected from 696 women factory workers. Participants were aged 18-56 years (mean 28 ± 5.8), 66% of whom were married and 25% of whom were migrants. Nearly 50% of participants reported at least one symptom of poor mental health. After adjusting for covariates associated with each outcome in the bivariate analysis, high job strain was associated with hopelessness (OR 2.68, 95% CI 1.58, 4.56), not feeling useful (OR 2.05, 95% CI 1.22, 3.43), and feeling depressed (OR 1.78, 95% CI 1.16, 2.72). **Conclusion:** This study expands on the international body of research on the well-being of women working in the global supply chain and provides evidence on the associations between occupational stressors, migration, and social support on symptoms of poor mental health among women workers. Future research to better understand and improve psychological health and to prevent suicide among workers in China's factories is critical to improve the health of China's labor force.

Sznajder et al. 2022.

International Archives of Occupational and Environmental Health, vol. 10, no. 1-11.

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Keywords: China; Mental health; Occupational health; Transients and migrants; Women

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01820-w>

The prevalence and work-related factors of burnout among public health workforce during the COVID-19 pandemic

Background: To examine the prevalence of burnout and its work-related factors among public health providers (PHP) during the COVID-19 pandemic. **Methods:** We surveyed 366 PHP in May 2021 on their burnout, demographic, and work-related characteristics. Logistic regression analyses were conducted to identify associated factors. **Results:** 45% PHP reported burnout. Higher PHP burnout was associated with younger age (AOR 0.96, 95% CI 0.93-0.99), prolonged COVID-19 involvement (AOR 2.35, 95% CI 1.16-4.72), as well as perceiving medium (AOR 2.10, 95% CI 1.27-3.48) and high emotional demand (AOR 4.45, 95% CI 1.67-11.77), low (AOR 2.10, 95% CI 1.27-3.48) and medium (AOR 4.18, 95% CI 1.64-10.59) role clarity, medium job satisfaction (AOR 3.21, 95% CI: 1.11-9.29), and low organisational justice (AOR 3.32, 95% CI 1.51-7.27). **Conclusions:** Improving job content and organisational characteristics may be key to reducing PHP burnout.

Ibrahim et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 1.

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Keywords: COVID-19; Burnout; Public health workforce

Evidence Level: 5A

Link:

https://journals.lww.com/joem/Fulltext/2022/01000/The_Prevalence_and_Work_Related_Factors_of_Burnout.18.aspx

Strategies to improve work attitude and mental health of problem employees: Focusing on airline cabin crew

Background: This study examines strategies for improving the work attitude and mental health of airlines' "problem employees". Based on a review of previous studies, five different handling methods for problem employees were derived: (1) duty assignment according to ability, (2) confidence beliefs, (3) managerial coaching, (4) human understanding, and (5) mentor system. The study hypothesized that these five approaches influence employees' work attitudes, mental health, and job performance. **Methods:** To verify these hypotheses, empirical data were collected from 200 airline crew members. **Results:** The analysis found that only three of the "five different handling methods of problem employees" positively influence job attitudes, mental health, and job performance: (1) duty assignment according to ability, (2) confidence beliefs, and (3) mentor system. In contrast, managerial coaching negatively impacted outcome variables. The study also found that the current handling approaches implemented in the industry have positive and negative outcomes on problem employees. **Discussion:** Therefore, airline companies need to manage problem staff based on the findings of this study. Particularly, when conducting managerial coaching, supervisors should check employees' work attitude change status. Research implications, limitations, and future research directions are discussed.

Kim et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: Airline; cabin crew; job performance; mental health; problem employee; work attitude

Evidence Level: 5A

Link: <https://www.mdpi.com/1660-4601/19/2/768>

Occupational and non-occupational injuries can result in prolonged augmentation of psychiatric disorders

Background: The long-term effects of occupational injury (OI) on psychiatric diseases are unclear. This study assessed and compared the effects of OI, no injury (control), and non-OI (NOI) on the development of psychiatric diseases. **Methods:** We used Taiwan's National Health Insurance Research Database to investigate the incidence of psychiatric disorders in OI, NOI, and control groups. The subjects were aged 20-50 years, actively employed in 2000, and did not have history of injury or psychiatric disorders. All subjects were followed from 2000 and were classified into OI, NOI, and control groups according to occurrence of target injury later on. Individuals in each group were matched by age, sex, insurance premium before the index date, and year of the index date. Psychiatric disease-free days were compared among the groups using survival analysis and Cox regression. **Results:** We included a total of 12,528 patients for final analysis, with 4,176 in each group. Compared with the control group, the OI group had an increased occurrence of trauma and stress-related disorder, depressive disorders, anxiety disorders, and alcohol and other substance dependence. These increases were similar to those in the NOI group. Elevated cumulative incidence rate of any psychiatric disorders was observed among those with OI or NOI up to 10 years after injury. **Conclusion:** We confirmed that OI and NOI induced psychiatric disorders. These findings highlight the need for workers' compensation mechanisms to consider long-term psychological care among injured workers.

Chin et al. 2022.

Journal of Epidemiology, vol. 32, no. 1.

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Keywords: Depression; Occupational injury; Psychiatric disorders; Trauma and stress-related disorder

Evidence Level: 5B

Link: https://www.jstage.jst.go.jp/article/jea/32/1/32_JE20200374/_article

Psychosocial Issues

Job insecurity and employees' taking charge behaviors: Testing a moderated mediation model

Background: Given the rapid changes in current technologies, business models, and work environments, organizations and managers increasingly rely on their employees' proactive behaviors, such as taking charge, to gain competitive advantages. Taking charge involves a range of risky and future-oriented behaviors, and it requires employees to work hard to achieve them in the future. For employees with high job-insecurity, their job continuity in the future is threatened. Thus, they may not be willing to take risks to do additional work that is "future-oriented". To our knowledge, the effect of job insecurity on employees' taking charge has rarely been studied. As a result, the purpose of our study is to investigate whether, how, and when job insecurity will influence taking charge. **Methods:** Drawing on the conservation of resources theory and proactive motivation model, we develop a theoretical model. Moreover, we employed a multi-wave and multi-source survey to test our predictions. **Results:** Based on the data from 194 full-time employees paired with their direct supervisors, the results provided consistent support for the proposed hypotheses. **Discussion:** Specifically, the results indicate that job insecurity prohibits employees' taking charge behaviors through deteriorating their work engagement. Furthermore, employees' perception of interactional justice moderates the negative influence of job insecurity on their work engagement and, consequently, their taking charge behaviors. Theoretical and practical implications are discussed.

Sun et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: Interactional justice; Job insecurity; Proactive behavior; Taking charge; Work engagement.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/2/696>

Family-to-work enrichment associations between family meal atmosphere and job satisfaction in dual-earner parents

Background: Research on factors related to job satisfaction in parents has mainly focused on work-related variables, paying less attention to family events that may provide parents with resources to invest in the work domain. **Methods:** To contribute to this body of knowledge, this study examined the associations between family meal atmosphere and job satisfaction in dual-earner parents with adolescent children, and tested the mediating role of family-to-work enrichment (FtoWE) between family meal atmosphere and job satisfaction. Questionnaires were administered to 473 different-gender dual-earner parents in Temuco, Chile. Participants answered the Project-EAT Atmosphere of family meals scale, three items that measure FWE from the Work-Home Interaction Survey, and the Overall Job Satisfaction Scale. Analyses were conducted using the Actor-Partner Interdependence Model and structural equation modelling. **Results:** A positive association was found from family meal atmosphere to job satisfaction, directly and via FtoWE in fathers, and only via FtoWE in mothers. No associations were found for these variables between parents, as, one parent's perception of a pleasant family meal atmosphere is positively associated with their own FtoWE and job satisfaction, but not with those of the other parent. **Discussion:** These findings suggest policymakers and organizations to account for workers' experiences in the family domain to improve satisfaction in the work domain.

Schnettler et al. 2022.

Current Psychology, vol. 20, no. 1-9.

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Keywords: Dual-earner couples; Dyadic analysis; Enrichment; Family meals; Job satisfaction; Resources

Evidence Level: 5A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8769786/>

Emojis predict dropouts of remote workers: An empirical study of emoji usage on GitHub

Background: Emotions at work have long been identified as critical signals of work motivations, status, and attitudes, and as predictors of various work-related outcomes. When more and more employees work remotely, these emotional signals of workers become harder to observe through daily, face-to-face

communications. The use of online platforms to communicate and collaborate at work provides an alternative channel to monitor the emotions of workers. **Methods:** This paper studies how emojis, as non-verbal cues in online communications, can be used for such purposes and how the emotional signals in emoji usage can be used to predict future behavior of workers. In particular, we present how the developers on GitHub use emojis in their work-related activities. **Results:** We show that developers have diverse patterns of emoji usage, which can be related to their working status including activity levels, types of work, types of communications, time management, and other behavioral patterns. **Discussion:** Developers who use emojis in their posts are significantly less likely to dropout from the online work platform. Surprisingly, solely using emoji usage as features, standard machine learning models can predict future dropouts of developers at a satisfactory accuracy. Features related to the general use and the emotions of emojis appear to be important factors, while they do not rule out paths through other purposes of emoji use.

Lu et al. 2022.

PLoS One, vol. 17, no. 1.

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Keywords: Work motivations; Remote; Emoji; GitHub

Evidence Level: 5A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0261262>

Psychosocial work factors and blood pressure among 63 800 employees from The Netherlands in the Lifelines Cohort Study

Background: Previous studies on the association between psychosocial work factors and blood pressure mainly focused on specific occupations or populations and had limited sample sizes. We, therefore, investigated the associations between psychosocial work factors and blood pressure in a large general working population in the Netherlands. **Methods:** We included 63 800 employees from the Netherlands, aged 18-65 years, with blood pressure measurements and a reliable job code at baseline. Psychosocial work factors (job strain, effort-reward imbalance (ERI) and emotional demands) in the current job were estimated with three recently developed psychosocial job exposure matrices. To examine the associations, regression analyses adjusted for covariates (age, sex, body mass index, education, monthly income, pack-years, smoking, alcohol consumption and antihypertensive medication (not included for hypertension)) were performed. **Results:** Higher job strain was associated with higher systolic blood pressure (SBP) (B (regression coefficients) (95% CI) 2.14 (1.23 to 3.06)) and diastolic blood pressure (DBP) (B (95% CI) 1.26 (0.65 to 1.86)) and with higher odds of hypertension (OR (95% CI) 1.43 (1.17 to 1.74)). Higher ERI was associated with higher DBP (B (95% CI) 4.37 (3.05 to 5.68)), but not with SBP or hypertension. Higher emotional demands were associated with lower SBP (B (95% CI) -0.90 (-1.14 to -0.66)) and lower odds of hypertension ((OR) (95% CI) 0.91 (0.87 to 0.96)). **Conclusions:** In the general working population, employees in jobs with high job strain and ERI have higher blood pressure compared with employees with low job strain and ERI. Emotional demands at work are inversely associated with blood pressure.

Faruque et al. 2022.

Journal of Epidemiology and Community Health, vol. 76, no. 1.

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Keywords: Blood pressure; Hypertension; Occupational health

Evidence Level: 4B

Link: <https://jech.bmj.com/content/76/1/60.long>

Enabling Healthy and Safe Workplaces

This month a number of studies explore the effect of addictive substance abuse, including the relationship between job satisfaction and alcohol consumption, how occupational healthcare personnel are tackling alcohol overuse, the relationship between physical exertion at work and addictive behaviours and how employment helps sustained recovery in employees recovering from alcohol dependency. The effect of shock-absorbing flooring for fall-related injury prevention and the relationship between perceived work

pace and physical work demands with occupational accidents are also explored. Chronic health issues such as nocturia, chronic obstructive respiratory diseases, cardiovascular outcomes and diabetes type II and their relationship with work are explored. Occupational exposure to ionizing radiation, radiofrequency electromagnetic fields, metal fume exposure, benzene, trichloroethylene and formaldehyde, cleaning products and disinfectants, pesticides, wildland fire and infectious disease are presented.

Health and Wellbeing

Short-term effectiveness of face-to-face periodic occupational health screening versus electronic screening with targeted follow-up: results from a quasi-randomized controlled trial in four Belgian hospitals

Background: In many countries, organisations are legally obliged to have occupational physicians screen employees regularly. However, this system is time-intensive, and there may be more cost-effective alternatives. Our objective is to compare the short-term effectiveness of periodic occupational health screening of hospital employees by an occupational physician with a system of electronic screening with targeted follow-up. **Methods:** A randomized controlled trial was set up among personnel of four Belgian hospitals, with three measurement moments between June 2019 and December 2020, to compare differences in self-assessed health, healthcare use, productivity and intermediate outcomes over 19 months. Mixed effects models were used to assess differences in effectiveness. Superiority and non-inferiority post-hoc tests were used as a robustness check. The experiment coincided with the first two COVID-19 waves during which hospital employees were exposed to an exceptional period of occupational stress. **Results:** In total, 1077 employees (34% of the target population) participated. Although we observed some immediate effects of the intervention (less trust in the physician, absenteeism, and healthcare use), all these effects disappeared over time. After 19 months, including two waves of COVID-19 hospitalizations, no significant differences were observed between employees screened through face-to-face contact and those screened electronically. **Conclusions:** Our study finds no indication that, in the short-term, substituting physician screening of the workforce with a quicker survey-based screening with targeted follow-up has different effects on the studied endpoints. However, as health and disease are often the result of a long-term process, more evidence is needed to determine long-term effects.

Steel et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 17.

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Keywords: Occupational screening; Health screening; Belgian

Evidence Level: 2B

Link: <https://www.sjweh.fi/article/4011>

Stress, pain, and work affiliation are strongly associated with health-related quality of life in parents of 14-15-year-old adolescents

Background: For many adults, their role as a parent is a vital part of their lives. This role is likely to be associated with a parent's health-related quality of life (HRQOL). The aim of this study was to explore the associations between gender, demographic and psychosocial variables, pain, and HRQOL in parents of 14-15-year-old adolescents. **Methods:** This was a cross-sectional study that included 561 parents. Data on demographic, psychosocial variables and pain were collected using validated instruments. HRQOL was assessed using the RAND-36. Data were analysed using univariate and hierarchical multiple linear regression analyses. **Results:** Four hundred and thirty-six (78%) mothers and 125 (22%) fathers with a mean age of 45 (SD = 5) years were included. Eighty-one per cent were married/cohabiting, 74% worked full time, and 50% had university education of more than 4 years. Almost one-third reported daily or weekly pain, and more than half (58%) reported using pain analgesics during the previous 4 weeks. Mothers reported significantly lower scores on self-efficacy, self-esteem and for all RAND-36 domains, including the physical component summary (PCS) and mental component summary (MCS) and experienced greater stress than fathers. Hierarchical regression analyses showed that working part-time (beta = 0.40) or full time (beta = 0.52) (reference: not working) had the strongest positive effect on PCS. Absence from work for > 10 days (beta = -0.24) (reference: no absence), short-term pain (beta = -0.14), chronic pain (beta = -0.37)

(reference: no pain), and stress ($\beta = -0.10$) had the strongest negative effects on PCS. High self-esteem ($\beta = 0.11$) had the strongest positive effect, whereas stress ($\beta = -0.58$) and absence from work for > 10 days ($\beta = -0.11$) (reference: no absence) had the strongest negative effects on MCS.

Conclusion: Mothers reported significantly lower scores on self-efficacy, self-esteem, and HRQOL, and experienced greater stress than the fathers. A high proportion of parents reported pain. Pain, stress, and low work affiliation were strongly associated with decreased HRQOL in parents. We recommend that parents of adolescents should be provided guidance about coping with pain and stress, and facilitation of a strong work affiliation because these seem to be important to parents' HRQOL.

Rohde et al. 2022.

Health and Quality of Life Outcomes, vol. 20, no. 1.

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Keywords: Health-related quality of life; Pain; Parents of adolescents; Stress; Work affiliation

Evidence Level: 5B

Link: <https://hqlo.biomedcentral.com/articles/10.1186/s12955-021-01913-7>

Job satisfaction and alcohol consumption: Empirical evidence from China

Background: Despite growing attention to job satisfaction as a social determinant of alcohol-related behaviors, few studies focus on its diverse impacts on alcohol consumption. **Methods:** Using data from the China Family Panel Study in 2018, this study uses logistic regression analysis to examine how job satisfaction affects alcohol consumption in China, finding that people who were satisfied with their jobs were more likely to be regularly drinking. **Results:** Employed people who were satisfied with their working environment and working hours were more likely to regularly drink, but those who were satisfied with their wages and working security were less likely to be regularly drinking. **Discussion:** Findings suggest that the link between job satisfaction and alcohol consumption is dynamic. Employment policies, working wellbeing improvement programs, and alcohol policy improvement should, therefore, be designed on the basis of a comprehensive account of entire job-related attitudes.

Ma et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: China; Alcohol consumption; Job satisfaction; Logistic regression; Working

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/2/933>

Occupational health care personnel tackling alcohol overuse - an observational study of work processes and patient characteristics

Background: Overuse of alcohol is a significant risk factor for early retirement. This observational study investigated patient characteristics and work processes in occupational health care (OHC) affecting practices in tackling alcohol overuse. **Methods:** The data were from 3089 patient contacts gathered for quality improvement purposes in fifteen OHC units during the years 2013-2019 in Finland. A two-proportion z-test was performed to find associations between reason for contact, and 17 other factors, and the probability of alcohol use being checked and overuse tackled. **Results:** OHC personnel checked alcohol use twice as often with male patients as with female patients. Employees at risk of needing sick leave were checked for alcohol use more often (55.4, 95% confidence interval 49.2-61.6%) than those on > 30-day sick leave or working with permanent work disability ($p < 0.01$). Alcohol use was checked in 64.1% (59.5-68.7%) of patients while making an individual health promotion plan compared to 36.9% of those without a plan (33.1-40.6%, $p < 0.0001$). Patients with depression were actively checked for alcohol use, especially in cases of major depression (72.7%, 64.0-81.0%). Work processes in which OHC should have been more active in checking and tackling alcohol use included assessing the need for rehabilitation (36.5%, 32.0-41.0%) and health check-ups (HCUs) for mental reasons (43.8%, 38.1-49.4%). HCUs where alcohol overuse was detected led to brief interventions to tackle the overuse in 58.1% (43.4-72.9%) of cases. **Conclusions:** The study showed factors that increased OHC personnel's practices in checking and tackling alcohol use and work processes where the activity should be improved. Discussions about alcohol use took place more often with working-aged men than women, the younger the more. OHC personnel checked actively alcohol

use with patients in danger of sick leave, patients treated for depression, while making an individual health promotion plan, and in planned HCUs with a confirmed protocol. More improvement is needed to conduct brief interventions in disability prevention processes, and especially when overuse is detected.

Kuronen et al. 2022.

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

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Keywords: Alcohol; Alcohol use disorder; Brief intervention; Depression; Disability; Health check-up; Intervention; Occupational health care; Pension; Prevention

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12473-2>

Work-related stress was not associated with increased cancer risk in a population-based cohort setting

Background: Stress is a commonly perceived cause of cancer, but the evidence to date is limited and inconclusive. We examined work-related stress in relation to cancer incidence in a population-based cohort, with outcome data from Swedish national registries. **Methods:** The study population included 113,057 participants in the Västerbotten Intervention Programme. HRs were estimated using Cox proportional hazards regression, for cancer overall and for types with ≥ 500 cases, and adjusting for several potential confounders. The primary exposure was prediagnostic work-related stress, using the well established Karasek job demand/control model. Demand and control variables were dichotomized at the median, and participants were classified according to combinations of these categories. We also considered social network and aspects of quality of life. **Results:** "High-strain" work (high demand/low control) was not associated with cancer risk compared with "low-strain" work (low demand/high control): multivariable HR 1.01 [95% confidence interval (CI), 0.94-1.08] for men and 0.99 (95% CI, 0.92-1.07) for women. Results were also null for most cancer types assessed: prostate, breast, colorectal, lung, and gastrointestinal (GI). The risk of GI cancer was lower for "passive" (low demand/low control) versus "low-strain" work, particularly for colorectal cancer in women: multivariable HR 0.71 (95% CI, 0.55-0.91), but statistical significance was lost after adjustment for multiple testing. **Conclusions:** The findings of this population-based, cohort study do not support a role for work-related stress in determining cancer risk. **Impact:** This study helps fill an important knowledge gap given the common concern about stress as a risk factor for cancer.

Hadrévi et al. 2022.

Cancer Epidemiology, Biomarkers and Prevention, vol. 31, no. 1.

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Keywords: Stress; Cancer risk; Work-related stress

Evidence Level: 4B

Link: <https://cebp.aacrjournals.org/content/31/1/51.long>

Physical exertion at work and addictive behaviors: tobacco, cannabis, alcohol, sugar and fat consumption: longitudinal analyses in the CONSTANCES cohort

Background: We examined the prospective association of physical exertion at work with subsequent tobacco, cannabis, alcohol use, and sugar and fat consumption. Volunteers of the French population-based CONSTANCES cohort currently employed were included from **Methods:** 2012 to 2017 for tobacco and cannabis outcomes ($n = 100,612$), and from 2012 to 2016 for alcohol and sugar and fat outcomes ($n = 75,414$). High level of physical exertion at work was defined as a score ≥ 12 at the Rating Perceived Exertion Borg scale. Substance use was self-reported and diet rich in sugar and fat was obtained from principal component analysis and analyzed as quartiles. Generalized linear models computed odds of substance use and sugar and fat consumption at follow-up according to baseline physical exertion at work, while adjusting for sociodemographic factors, depressive symptoms and baseline level of consumption. **Results:** High physical exertion was associated with tobacco use with dose-dependent relationships. It was also associated with increased odds of cannabis use at least once per month compared to no use in the past and with increased odds of diet rich in sugar and fat. **Discussion:** Hence, the role of physical exertion at work

on tobacco and cannabis use and diet rich in sugar and fat should be tackled for information and prevention strategies.

Hamieh et al. 2022.

Scientific Reports, vol. 12, no. 1.

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Keywords: Work; Addictive Behaviours; Cannabis; Alcohol; Sugar; Fat consumption; Tobacco

Evidence Level: 4B

Link: <https://www.nature.com/articles/s41598-021-04475-2>

Work Health and Safety

The SAFEST review: a mixed methods systematic review of shock-absorbing flooring for fall-related injury prevention

Background: Shock-absorbing flooring may minimise impact forces incurred from falls to reduce fall-related injuries; however, synthesized evidence is required to inform decision-making in hospitals and care homes.

Methods: This is a Health Technology Assessment mixed methods systematic review of flooring interventions targeting older adults and staff in care settings. Our search incorporated the findings from a previous scoping review, MEDLINE, AgeLine, and Scopus (to September 2019) and other sources. Two independent reviewers selected, assessed, and extracted data from studies. We assessed risk of bias using Cochrane and Joanna Briggs Institute tools, undertook meta-analyses, and meta-aggregation. **Results:** 20 of 22 included studies assessed our outcomes (3 Randomised Controlled Trials (RCTs); 7 observational; 5 qualitative; 5 economic), on novel floors (N = 12), sports floors (N = 5), carpet (N = 5), and wooden sub-floors (N = 1). Quantitative data related to 11,857 patient falls (9 studies), and 163 staff injuries (1 study). One care home-based RCT found a novel underlay produced similar injurious falls rates (high-quality evidence) and falls rates (moderate-quality evidence) to a plywood underlay with vinyl overlay and concrete sub-floors. Very low-quality evidence suggested that shock-absorbing flooring may reduce injuries in hospitals (Rate Ratio 0.55, 95% CI 0.36 to 0.84, 2 studies; 27.1% vs. 42.4%; Risk Ratio (RR) = 0.64, 95% CI 0.44 to 0.93, 2 studies) and care homes (26.4% vs. 33.0%; RR 0.80, 95% CI 0.70 to 0.91, 3 studies), without increasing falls. Economic evidence indicated that if injuries are fewer and falls not increased, then shock-absorbing flooring would be a dominant strategy. Fracture outcomes were imprecise; however, hip fractures reduced from 30 in 1000 falls on concrete to 18 in 1000 falls on wooden sub-floors (OR 0.59, 95% CI 0.45 to 0.78; one study; very low-quality evidence). Staff found moving wheeled equipment harder on shock-absorbing floors leading to workplace adaptations. Very low-quality evidence suggests staff injuries were no less frequent on rigid floors. **Conclusion:** Evidence favouring shock-absorbing flooring is uncertain and of very low quality. Robust research following a core outcome set is required, with attention to wider staff workplace implications.

Drahota et al. 2022.

BMC Geriatric, vol. 22, no. 1.

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Keywords: Accidental falls; Bone; Floors and floor coverings; Fractures, hospitals; Long-term care

Evidence Level: 1A

Link: <https://bmgeriatr.biomedcentral.com/articles/10.1186/s12877-021-02670-4>

Association of perceived work pace and physical work demands with occupational accidents: a cross-sectional study of ageing male construction workers in Denmark

Background: Occupational accidents continue to be a significant public health challenge worldwide.

Construction workers in particular are at high risk of occupational accidents, and thus it is of major importance to identify possible predictors of occupational accidents among construction workers. We aimed to investigate the association between self-reported work pace and physical work demands and occupational accidents among ageing male construction workers in Denmark. **Methods:** Data on perceived work pace, physical work demands, and occupational accidents was acquired from questionnaires sent to ageing construction workers in Denmark in 2016 as part of the ALFA project (ALdring og Fysisk Arbejde;

Ageing and Physical Work). A sample of 1270 Danish male construction workers above 50 years of age was included in the present study. Multiple logistic regression models were applied, with adjustments for age, smoking, body mass index, musculoskeletal disorders, occupation, work experience, and support at work. **Results:** Of 1270 construction workers, 166 (13.1%) reported an occupational accident within the last 12 months. There was no significant association between perceived work pace and occupational accidents, but physical work demands were associated with higher odds for occupational accidents, with an odds ratio of 2.27 (95% confidence interval 1.26-4.10) for medium physical work demands and 2.62 (95% confidence interval 1.50-4.57) for high physical work demands. **Conclusions:** Ageing male construction workers with high physical work demands had statistically significant higher odds of having an occupational accident. By contrast, perceived work pace was not associated with occupational accidents in this large cross-sectional study.

Hansen et al. 2022.

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

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Keywords: Blue-collar worker; Job demand; Manual worker; Work accident; Work characteristic

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12461-6>

Risk Assessment

Under-reporting of non-fatal occupational injuries among precarious and non-precarious workers in Sweden

Background: Under-reporting of occupational injuries (OIs) among precariously employed workers in Sweden challenges effective surveillance of OIs and targeted preventive measures. **Objective:** To estimate the magnitude of under-reporting of OIs among precarious and non-precarious workers in Sweden in 2013.

Methods: Capture-recapture methods were applied using the national OIs register and records from a labour market insurance company. Employed workers 18-65 resident in Sweden in 2013 were included in the study (n=82 949 OIs). Precarious employment was operationalised using the national labour market register, while injury severity was constructed from the National Patient Register. Under-reporting estimates were computed stratifying by OIs severity and by sociodemographic characteristics, occupations and precarious employment. **Results:** Under-reporting of OIs followed a dose-response pattern according to the levels of precariousness (the higher the precarious level, the higher the under-reporting) being for the precarious group (22.6%, 95% CI 21.3% to 23.8%), followed by the borderline precarious (17.6%, 95% CI 17.1% to 18.2%) and lastly the non-precarious (15.0%, 95% CI 14.7% to 15.3%). Under-reporting of OIs, decreased as the injury severity increased and was higher with highest level of precariousness in all groups of severity. We also observed higher under-reporting estimates among all occupations in the precarious and borderline precarious groups as compared with the non-precarious ones. **Conclusions:** This is the first register-based study to empirically demonstrate in Sweden that under-reporting of OIs is 50% higher among precariously employed workers. OIs under-reporting may represent unrecognised injuries that especially burden precariously employed workers as financial, health and social consequences shift from the employer to the employee.

Kreshpaj et al. 2022.

Occupational and Environmental Medicine, vol. 79, no. 1.

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Keywords: Epidemiology; Occupational Health; Public health

Evidence Level: 5B

Link: <https://oem.bmj.com/content/79/1/3.long>

Lifting capacity prediction model using physical performance measures among construction workers

Manual materials handling is performed in many workplaces and is a significant risk factor for musculoskeletal injuries. The identification of lifting capacity is important to reduce the occurrence of

musculoskeletal injuries. Lifting capacity is difficult to evaluate at the workplace. Therefore, there is a need to develop an alternate method that is easy and could be performed at the workplace. The study aimed to develop a lifting capacity prediction model for construction workers based on muscle strength and endurance. In this study, 65 construction workers were recruited; their socio-demographic and physical characteristics like core strength and endurance, grip strength, and lower limb flexibility were assessed. The lifting capacity was assessed using progressive isoinertial lifting evaluation. Stepwise multiple linear regression was carried out to develop the prediction model. The study suggested that age, BMI, grip strength, flexibility, prone plank, and trunk lateral flexor endurance tests have significantly influenced lifting capacity. Hence prediction model is developed using these variables. The regression model developed would help in easy estimation of lifting capacity among construction workers, which could be even administered with minimal skills by site supervisors or managers. It might help in the decision-making during pre-placement or return to work evaluations, thereby minimizing the incidence of low back disorders.

Mohapatra et al. 2022.

Scientific Reports, vol. 12, no. 1.

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Keywords: Manual handling; Physical performance; Musculoskeletal injuries; Construction workers

Evidence Level: 5A

Link: <https://www.nature.com/articles/s41598-022-05106-0>

Chronic Health Issues

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

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

Vegeris et al. 2022.

OTJR: Occupation, Participation and Health, vol. 42, no. 1.

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Keywords: Health; Leisure; Occupation; Qualitative research

Evidence Level: 5A

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

Impacts of nocturia on quality of life, mental health, work limitation, and health care seeking in China, Taiwan and South Korea (LUTS Asia): Results from a cross-sectional, population-based study

Background: While nocturia has been proposed to be related to various systemic diseases and even mortality, there has been little information of the impact of nocturia in other aspects of physical and mental well-being. We evaluated the impact of nocturia on quality of life (QoL), mental health, work limitation, and health-care seeking behavior. **Methods:** An internet-based self-administered survey was distributed among individuals aged ≥40 years with the ability to use a computer and to read the local language. Survey questions included demographic details, International Continence Society symptom definitions and the international prostate symptom score. Impact on nocturia on health-related QoL physical and mental health domain, Hospital Anxiety and Depression Scale (HADS) score and Work

Limitations Questionnaire (WLQ) measures was evaluated. **Results:** There were 8284 participants (women, 51%) of whom 34% were aged ≥ 60 years. Prevalence of nocturia ≥ 2 was 35% in men and 37% in women. Across both genders, QoL decreased with increasing frequency of nocturia. Besides nocturia, hypertension, presence of neurological disorder, lower urinary tract symptom measures and female gender were also associated with HADS anxiety and depression scores of ≥ 8 . Nocturia significantly impacted work ability across WLQ measures. Though the utilization of prescription medications increased with the increase in frequency of nocturia, it was also noted that up to 30% of participants who reported nocturia frequency of ≥ 3 did not seek any treatment for their complaints. **Conclusion:** Nocturia significantly affects QoL, work productivity, and mental well-being. However, healthcare utilization remains low and warrants increased awareness and education in the patients, caregivers and physicians.

Chow et al. 2022.

Journal of the Formosan Medical Association, vol. 121, no. 1.

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Keywords: LUTS Asia; Mental health; Nocturia; Quality of life; Work efficiency

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0929664621001625?via%3Dihub>

Occupation, socioeconomic status and chronic obstructive respiratory diseases - The EpiLung study in Finland, Estonia and Sweden

Background: To study occupational groups and occupational exposure in association with chronic obstructive respiratory diseases. **Methods:** In early 2000s, structured interviews on chronic respiratory diseases and measurements of lung function as well as fractional expiratory nitric oxide (F_{ENO}) were performed in adult random population samples of Finland, Sweden and Estonia. Occupations were categorized according to three classification systems. Occupational exposure to vapours, gases, dusts and fumes (VGDF) was assessed by a Job-Exposure Matrix (JEM). The data from the countries were combined.

Results: COPD, smoking and occupational exposure were most common in Estonia, while asthma and occupations requiring higher educational levels in Sweden and Finland. In an adjusted regression model, non-manual workers had a three-fold risk for physician-diagnosed asthma (OR 3.18, 95%CI 1.07-9.47) compared to professionals and executives, and the risk was two-fold for healthcare & social workers (OR 2.28, 95%CI 1.14-4.59) compared to administration and sales. An increased risk for physician-diagnosed COPD was seen in manual workers, regardless of classification system, but in contrast to asthma, the risk was mostly explained by smoking and less by occupational exposure to VGDF. For F_{ENO} , no associations with occupation were observed. **Conclusions:** In this multicenter study from Finland, Sweden and Estonia, COPD was consistently associated with manual occupations with high smoking prevalence, highlighting the need to control for tobacco smoking in studies on occupational associations. In contrast, asthma tended to associate with non-manual occupations requiring higher educational levels. The occupational associations with asthma were not driven by eosinophilic inflammation presented by increased F_{ENO} .

Jalasto et al. 2022.

Respiratory Medicine, vol. 191.

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Keywords: Asthma; COPD; Fraction of exhaled nitric oxide (F_{ENO}); Occupational exposure; Smoking; Socioeconomic status

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0954-6111\(21\)00109-8](https://linkinghub.elsevier.com/retrieve/pii/S0954-6111(21)00109-8)

Long working hours and risk of cardiovascular outcomes and diabetes type II: five-year follow-up of the Gutenberg Health Study (GHS)

Background: The aims of this study were to determine if there was an increased risk of incident cardiovascular disease (CVD) and diabetes and an increase in arterial stiffness in participants who reported working 41-54 h per week and more than 55 h compared to those who worked 40 h or less over a time interval of 5 years. **Methods:** In a subsample of the population-based prospective Gutenberg Health Study (GHS) study, we examined working participants younger than 65 years at baseline ($n = 7241$) and after 5

years. To test the association of working time at baseline and incident cardiovascular events and diabetes type II, we estimated hazard ratios (HR) using competing risks models. For a change in the arterial stiffness index (SI) based on assessment using a Pulse Trace PCA2 device, we used multivariate linear regression models. **Results:** The SI increased in those working more than 55 h per week (beta coefficient = 0.32 m/s (95% CI 0.07-0.58) compared to those working 40 h and less after adjustment for sex, age and SES. Due to small numbers there was no significant association of working hours and clinically manifest cardiovascular events and diabetes type II in the 5-year follow-up time. **Conclusions:** Further studies are needed to confirm the results on working hours and arterial stiffness. Analyses of the 10-year follow-up with more events may clarify the results for incident cardiovascular events and metabolic outcomes.

K et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 1.

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Keywords: Arterial stiffness; Diabetes; Occupational health; Prospective cohort study; cardiovascular disease; Working time

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01786-9>

Occupational Exposure

Relationship between exposure to ionizing radiation and mesothelioma risk: A systematic review of the scientific literature and meta-analysis

Background: Ionizing radiation and mesothelioma have been examined among personnel employed in nuclear power plant and patients treated by external beam radiation therapy (EBRT). The association is still controversial; the purpose of this review is to summarize the scientific evidence published in the literature regarding the relationship between ionizing radiation and incidence of mesothelioma and, if possible, estimating strongness of the association by meta-analysis of extracted data. **Methods:** Articles included in the systematic review were retrieved by searching among the three main scientific databases: PubMed, Scopus, and Embase. The literature search was conducted in June 2021. A meta-analysis of random effects was conducted, stratified by exposure (EBRT, occupational exposure). The heterogeneity of the summary relative risks (RRs) was assessed using I^2 statistics. Publication bias was evaluated graphically through the funnel plot. **Findings:** The exposure to ionizing radiation could be a risk factor for mesothelioma: both for exposure to high doses for short periods (EBRT) (RR of 3.34 [95% confidence interval, CI 1.24-8.99]) and for exposure to low doses for a prolonged duration (exposure working) (RR of 3.57 [95% CI 2.16-5.89]).

Conclusions: Despite the low number of mesotheliomas in the general population, the steadily increased risk among individuals exposed to radiation is still worth considering.

Visci et al. 2022.

Cancer Medicine, vol. 11, no.3 .

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Keywords: Ionizing radiation; Mesothelioma; Nuclear industry; Radiotherapy

Evidence Level: 1A

Link: <https://onlinelibrary.wiley.com/doi/10.1002/cam4.4436>

Long-term metal fume exposure assessment of workers in a shipbuilding factory

Background: This study aims to assess the metal fume exposure of welders and to determine exposure rates for similar exposure groups in a shipyard through the use of Near-field/Far-field (NF/FF) mathematical model and Bayesian decision analysis (BDA) technique. **Methods:** Emission rates of various metal fumes (i.e., total chromium (Cr), iron (Fe), lead (Pb), manganese (Mn), and nickel (Ni)) were experimentally determined for the gas metal arc welding and flux cored arc welding processes, which are commonly used in shipyards. Then the NF/FF field model which used the emission rates were further validated by welding simulation experiment, and together with long-term operation condition data obtained from the investigated shipyard, the predicted long-term exposure concentrations of workers was established and used as the prior distribution in the BDA. Along with the field monitoring metal fume concentrations which

served as the likelihood distribution, the posterior decision distributions in the BDA were determined and used to assess workers' long-term metal exposures. **Results:** Results show that the predicted exposure concentrations (Cp) and the field worker's exposure concentrations (Cm) were statistically correlated, and the high R2 (= 0.81-0.94) indicates that the proposed surrogate predicting method by the NF and FF model was adequate for predicting metal fume concentrations. The consistency in both prior and likelihood distributions suggests the resultant posterior would be more feasible to assess workers' long-term exposures. **Discussion:** Welders' Fe, Mn and Pb exposures were found to exceed their corresponding action levels with a high probability (= 54%), indicating preventive measures should be taken immediately. The proposed approach provides a universal solution for conducting exposure assessment with usual limited number of personal exposure data.

Wang et al. 2022.

Scientific Reports, vol. 12, no. 1.

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Keywords: Metal fume exposure; Exposure rates; Welders

Evidence Level: 5A

Link: <https://www.nature.com/articles/s41598-021-04761-z>

Epigenetic aging biomarkers and occupational exposure to benzene, trichloroethylene and formaldehyde

Background: Epigenetic aging biomarkers are associated with increased morbidity and mortality. We evaluated if occupational exposure to three established chemical carcinogens is associated with acceleration of epigenetic aging. **Methods:** We studied workers in China occupationally exposed to benzene, trichloroethylene (TCE) or formaldehyde by measuring personal air exposures prior to blood collection. Unexposed controls matched by age and sex were selected from nearby factories. We measured leukocyte DNA methylation (DNAm) in peripheral white blood cells using the Infinium HumanMethylation450 BeadChip to calculate five epigenetic aging clocks and DNAmTL, a biomarker associated with leukocyte telomere length and cell replication. We tested associations between exposure intensity and epigenetic age acceleration (EAA), defined as the residuals of regressing the DNAm aging biomarker on chronological age, matching factors and potential confounders. Median differences in EAA between exposure groups were tested using a permutation test with exact p-values. Epigenetic clocks were strongly correlated with age (Spearman $r > 0.8$) in all three occupational studies. **Results:** There was a positive exposure-response relationship between benzene and the Skin-Blood Clock EAA biomarker: median EAA was -0.91 years in controls (n = 44), 0.78 years in workers exposed to <10 ppm (n = 41; mean benzene = 1.35 ppm; p = 0.034 vs. controls), and 2.10 years in workers exposed to ≥10 ppm (n = 9; mean benzene = 27.3 ppm; p = 0.019 vs. controls; $p_{\text{trend}} = 0.0021$). In the TCE study, control workers had a median Skin-Blood Clock EAA of -0.54 years (n = 71) compared to 1.63 years among workers exposed to <10 ppm of TCE (n = 27; mean TCE = 4.22 ppm; p = 0.035). We observed no evidence of EAA associations with formaldehyde exposure (39 controls, 31 exposed). Occupational benzene and TCE exposure were associated with increased epigenetic age acceleration measured by the Skin-Blood Clock. For TCE, there was some evidence of epigenetic age acceleration for lower exposures compared to controls. **Discussion:** Our results suggest that some chemical carcinogens may accelerate epigenetic aging.

van der Laan et al. 2022.

Environment International, vol. 158.

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Keywords: Benzene; DNA methylation; Epigenetic age; Formaldehyde; Occupational health; Trichloroethylene

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0160412021004967?via%3DiHub>

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

Background: Firefighters are exposed to a variety of known and suspected carcinogens through their work. However, the association with cancer risk has limited evidence. We examined cancer incidence among firefighters in the newly established Norwegian Fire Departments Cohort restricted to sites with established

associations with carcinogens encountered during firefighting. This included sites within the respiratory, urinary, and lympho-hematopoietic systems, and the skin and all sites combined. **Methods:** Male firefighters (N=3881) in the cohort were linked to the Cancer Registry of Norway for incident cancer cases occurring during the period 1960-2018. We calculated standardized incidence ratios (SIR) with rates for the national male population as reference, and stratified SIR analyses by period of first employment, duration of employment, and time since first employment. **Results:** Elevated risk was seen for all sites combined (SIR 1.15, 95% confidence interval 1.07-1.23). Elevated risk of urinary tract cancer was observed among firefighters who began working before 1950, and with observation ≥ 40 years since first employment. Risk of mesothelioma and laryngeal cancer were elevated with ≥ 40 years since first employment and with ≥ 30 years employment duration. **Conclusions:** The observed associations between firefighting and urinary tract cancer, laryngeal cancer, and mesothelioma have been observed in some studies previously, and our results suggest the observed elevated risks are related to carcinogenic occupational exposures. Differences in risk by period of employment potentially reflect changes in exposures from improved quality and use of personal protective equipment.

Marjerrison et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 11.

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Keywords: Cancer; Occupational exposure; Carcinogens

Evidence Level: 4B

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

Maternal preconception occupational exposure to cleaning products and disinfectants and offspring asthma

Background: Emerging research suggests health effects in offspring after parental chemical exposures before conception. Many future mothers are exposed to potent chemicals at work, but potential offspring health effects are hardly investigated. **Objective:** We sought to investigate childhood asthma in relation to mother's occupational exposure to cleaning products and disinfectants before conception. **Methods:** The multicenter Respiratory Health In Northern Europe/Respiratory Health In Northern Europe, Spain and Australia generation study investigated asthma and wheeze starting at age less than 10 years in 3318 mother-offspring pairs. From an asthma-specific Job-Exposure Matrix and mothers' occupational history, we defined maternal occupational exposure to indoor cleaning agents (cleaning products/detergents and disinfectants) starting before conception, in the 2-year period around conception and pregnancy, or after birth. Never-employed mothers were excluded. Exposed groups include cleaners, health care workers, cooks, and so forth. Associations were analyzed using mixed-effects logistic regression and ordinary logistic regression with clustered robust SEs and adjustment for maternal education. **Results:** Maternal occupational exposure to indoor cleaning starting preconception and continuing (n = 610) was associated with offspring's childhood asthma: odds ratio 1.56 (95% CI, 1.05-2.31), childhood asthma with nasal allergies: 1.77 (1.13-2.77), and childhood wheeze and/or asthma: 1.71 (95% CI, 1.19-2.44). Exposure starting around conception and pregnancy (n = 77) was associated with increased childhood wheeze and/or asthma: 2.25 (95% CI, 1.03-4.91). Exposure starting after birth was not associated with asthma outcomes (1.13 [95% CI, 0.71-1.80], 1.15 [95% CI, 0.67-1.97], 1.08 [95% CI, 0.69-1.67]). **Conclusions:** Mother's occupational exposure to indoor cleaning agents starting before conception, or around conception and pregnancy, was associated with more childhood asthma and wheeze in offspring. Considering potential implications for vast numbers of women in childbearing age using cleaning agents, and their children, further research is imperative.

Tjalvin et al. 2022.

The Journal of Allergy and Clinical Immunology, vol. 149, no. 1.

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Keywords: Job-Exposure Matrix (JEM); Occupational exposures; RHINESSA; Childhood asthma; Cleaning products; Disinfectants; Generation study; Mother; Preconception exposures

Evidence Level: 4A

Link: [https://www.jacionline.org/article/S0091-6749\(21\)01399-3/fulltext](https://www.jacionline.org/article/S0091-6749(21)01399-3/fulltext)

Occupational exposure to pesticides and lung cancer risk: A propensity score analyses

Backgrounds: Occupational exposure to pesticides is thought to be associated with lung cancer, but studies have yielded conflicting results. We performed a propensity score (PS) based analyses to evaluate the relationship between occupational exposure to pesticides and lung cancer risk in the Korea National Cancer Center community-based cohort study (KNCCCS). **Materials and methods:** During the follow-up period, 123 incidental lung cancer cases were identified, of the 7,471 subjects in the final statistical analysis.

Information about occupational exposure to pesticides and other factors was collected at enrollment (2003-2010). Cox proportional hazards regression analyses were conducted. Four PS-based approaches (i.e., matching, stratification, inverse probability-of-treatment weighting, and the use of the PS as a covariate) were adopted, and the results were compared. PS was obtained from the logistic regression model. Absolute standardized differences according to occupational exposure to pesticides were provided to evaluate the balance in baseline characteristics. **Results:** In the Cox proportional hazards regression model, the hazard ratio (HR) for lung cancer according to occupational exposure to pesticides was 1.82 (95% confidence interval [CI], 1.11 to 2.98). With all the propensity score matching (PSM) methods, the HRs for lung cancer based on exposure to pesticides ranged from 1.65 (95% CI, 1.04 to 2.64) (continuous term with PSM) to 2.84 (95% CI, 1.81 to 4.46) (stratification by 5 strata of the PS). The results varied slightly based on the method used, but the direction and statistical significance remained the same.

Conclusion: Our results strengthen the evidence for an association between occupational exposure to pesticides and the risk of lung cancer.

Kim et al. 2022.

Cancer Research and Treatment, vol. 54, no. 1.

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

Keywords: Lung neoplasms; Pesticide; Propensity score methods

Evidence Level: 5B

Link: <https://www.e-crt.org/journal/view.php?doi=10.4143/crt.2020.1106>

Health risks and mitigation strategies from occupational exposure to wildland fire: a scoping review

Background: Due to accelerating wildland fire activity, there is mounting urgency to understand, prevent, and mitigate the occupational health impacts associated with wildland fire suppression. The objectives of this review of academic and grey literature were to: 1. Identify the impact of occupational exposure to wildland fires on physical, mental, and emotional health; and 2. Examine the characteristics and effectiveness of prevention, mitigation, or management strategies studied to reduce negative health outcomes associated with occupational exposure to wildland fire. **Methods:** Following established scoping review methods, academic literature as well as government and industry reports were identified by searching seven academic databases and through a targeted grey literature search. 4679 articles were screened using pre-determined eligibility criteria. Data on study characteristics, health outcomes assessed, prevention or mitigation strategies studied, and main findings were extracted from each included document. The results of this scoping review are presented using descriptive tables and a narrative summary to organize key findings. **Results:** The final sample was comprised of 100 articles: 76 research articles and 24 grey literature reports. Grey literature focused on acute injuries and fatalities. Health outcomes reported in academic studies focused on respiratory health (n = 14), mental health (n = 16), and inflammation and oxidative stress (n = 12). The identified studies evaluated short-term outcomes measuring changes across a single shift or wildland fire season. Most research was conducted with wildland firefighters and excluded personnel such as aviation crews, contract crews, and incident management teams. Five articles reported direct study of mitigation strategies, focusing on the potential usage of masks, advanced hygiene protocols to reduce exposure, fluid intake to manage hydration and core temperature, and glutamine supplementation to reduce fatigue. **Conclusions:** While broad in scope, the evidence base linking wildland fire exposure to any one health outcome is limited. The lack of long-term evidence on changes in health status or morbidity is a clear evidence gap and there is a need to prioritize research on the mental and physical health impact of occupational exposure to wildland fire.

Koopmans et al. 2022.

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

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Keywords: Mitigation; Occupational exposure; Occupational health; Prevention; Scoping review; Wildfire; Wildland fire; Wildland firefighter

Evidence Level: 6A

Link: <https://occup-med.biomedcentral.com/articles/10.1186/s12995-021-00328-w>

Exposure assessment to radiofrequency electromagnetic fields in occupational military scenarios: a review

Background: Radiofrequency radiations are used in most devices in current use and, consequently, the assessment of the human exposure to the radiofrequency radiations has become an issue of strong interest. Even if in the military field there is wide use of radiofrequency devices, a clear picture on the exposure assessment to the electromagnetic field of the human beings in the military scenario is still missing. **Methods:** A review of the scientific literature regarding the assessment of the exposure of the military personnel to the RF specific to the military environment, was performed. **Results:** The review has been performed grouping the scientific literature by the typology of military devices to which the military personnel can be exposed to. The military devices have been classified in four main classes, according to their intended use: communication devices, localization/surveillance devices, jammers and EM directed-energy weapons. **Discussion and Conclusions:** The review showed that in the exposure conditions here evaluated, there were only occasional situations of overexposure, whereas in the majority of the conditions the exposure was below the worker exposure limits. Nevertheless, the limited number of studies and the lack of exposure assessment studies for some devices prevent us to draw definitive conclusions and encourage further studies on military exposure assessment.

Gallucci et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: EM fields; Military devices; Military environment; Occupational exposure

Evidence Level: 6A

Link: <https://www.mdpi.com/1660-4601/19/2/920>

Causes of irritant contact dermatitis after occupational skin exposure: a systematic review

Background: Irritant contact dermatitis (ICD) is a major cause of occupational disease. The aim was to review the relation between exposure to occupational irritants and ICD and the prognosis of ICD.

Methods: Through a systematic search, 1516 titles were identified, and 48 studies were included in the systematic review. **Results:** We found that the evidence for an association between ICD and occupational irritants was strong for wet work, moderate for detergents and non-alcoholic disinfectants, and strong for a combination. The highest quality studies provided limited evidence for an association with use of occlusive gloves without other exposures and moderate evidence with simultaneous exposure to other wet work irritants. The evidence for an association between minor ICD and exposure to metalworking fluids was moderate. Regarding mechanical exposures, the literature was scarce and the evidence limited. We found that the prognosis for complete healing of ICD is poor, but improves after decrease of exposure through change of occupation or work tasks. There was no substantial evidence for an influence of gender, age, or household exposures. Inclusion of atopic dermatitis in the analysis did not alter the risk of ICD. Studies were at risk of bias, mainly due to selection and misclassification of exposure and outcome. This may have attenuated the results. **Conclusion:** This review reports strong evidence for an association between ICD and a combination of exposure to wet work and non-alcoholic disinfectants, moderate for metalworking fluids, limited for mechanical and glove exposure, and a strong evidence for a poor prognosis of ICD.

Jacobsen et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 1.

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Keywords: Hand eczema; Irritant contact dermatitis; Occupational contact dermatitis; Prognosis; Skin exposure

Evidence Level: 1A

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01781-0>

Global infectious disease risks associated with occupational exposure among non-healthcare workers: a systematic review of the literature

Background: Employees in non-healthcare occupations may be in several ways exposed to infectious agents. Improved knowledge about the risks is needed to identify opportunities to prevent work-related infectious diseases. The objective of the current study was to provide an updated overview of the published evidence on the exposure to pathogens among non-healthcare workers. Because of the recent SARS-CoV-2 outbreaks, we also aimed to gain more evidence about exposure to several respiratory tract pathogens.

Methods: Eligible studies were identified in MEDLINE, Embase and Cochrane between 2009 and 8 December 2020. The protocol was registered with International Prospective Register of Systematic Reviews (CRD42019107265). An additional quality assessment was applied according to the Equator network guidelines.

Results: The systematic literature search yielded 4620 papers of which 270 met the selection and quality criteria. Infectious disease risks were described in 37 occupational groups; 18 of them were not mentioned before. Armed forces (n=36 pathogens), livestock farm labourers (n=31), livestock/dairy producers (n=26), abattoir workers (n=22); animal carers and forestry workers (both n=16) seemed to have the highest risk. In total, 111 pathogen exposures were found. Many of these occupational groups (81.1%) were exposed to respiratory tract pathogens. **Conclusion:** Many of these respiratory tract pathogens were readily transmitted where employees congregate (workplace risk factors), while worker risk factors seemed to be of increasing importance. By analysing existing knowledge of these risk factors, identifying new risks and susceptible risk groups, this review aimed to raise awareness of the issue and provide reliable information to establish more effective preventive measures.

Acke et al. 2022.

Occupational and Environmental Medicine, vol. 79, no. 1.

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Keywords: Communicable diseases; Military personnel; Occupational health; Respiratory system; Zoonoses

Evidence Level: 1A

Link: <https://oem.bmj.com/content/79/1/63.long>

Sedentary Practices

Design and evaluation of a Just-In-Time Adaptive Intervention (JITAI) to reduce sedentary behavior at work: Experimental Study

Background: Employees in sedentary occupations tend to spend prolonged hours physically inactive. Physical inactivity is a main factor in the increase in the risks of a wide range of chronic diseases, including obesity, diabetes, hypertension, and heart disease. This has drawn researchers' attention to investigate methods of increasing the level of activity of employees during working hours and in their daily lifestyle.

Objective: The objective of this paper is to investigate the effectiveness of using personalized messages that include user information, user goals, daily routine, and the surrounding environment to increase the level of activity among employees. In this study, we hypothesize that sending context-aware motivational messages to workers in sedentary occupations after sitting for 40 minutes can break sedentary behavior and increase daily active time compared to static reminder messages. **Methods:** A 66-day between-group study using a mixed methods design approach was conducted with employees who are located in Qatar and spend most of their working day sedentary. The 58 participants used 2 different interventions: The control group (n=29, 50%) used a mobile app that only sends a static message after prolonged sitting (MotiFit Lite), and the intervention group (n=29, 50%) used a mobile app that sends context-aware personalized messages to promote physical activity (PA; MotiFit). Both apps log the received messages, the step count before and after the messages are sent, and the user response to the messages to obtain an idea of the impact of the messages. The study received approval from the Qatar Biomedical Research Institute's institutional review board (IRB application #2019-10-037). **Results:** The questionnaires showed satisfaction of the designed apps' subjective quality and perceived impact. The quantitative analysis showed a high level of engagement in the intervention group compared to the control group (P<.001). The

results support the original hypothesis that using context-aware motivational messages can increase PA at work compared to static messages ($P < .001$). However, the analysis showed no significant impact of the message type on the overall activity level during the day ($P = .06$). **Conclusions:** Context-aware motivational messages motivate employees to increase their PA in the workplace. However, future research will further develop the analysis to investigate the impact on increasing the overall activity level during the day.

Ismail et al. 2022.

JMIR Formative Research, vol. 6, no. 1.

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Keywords: Adaptive intervention; Behavior change; Persuasive technology; Physical activity; Sedentary behavior

Evidence Level: 3B

Link: <https://formative.jmir.org/2022/1/e34309/>

Workplace neighbourhood built-environment attributes and sitting at work and for transport among Japanese desk-based workers

Background: Workplace settings-both internal and external-can influence how workers are physically active or sedentary. Although research has identified some indoor environmental attributes associated with sitting at work, few studies have examined associations of workplace neighbourhood built-environment attributes with workplace sitting time. **Methods:** We examined the cross-sectional associations of perceived and objective workplace neighbourhood built-environment attributes with sitting time at work and for transport among desk-based workers in Japan. Data were collected from a nationwide online survey. The Abbreviated Neighborhood Environment Walkability Scale ($n = 2137$) and Walk Score® (for a subsample of participants; $n = 1163$) were used to assess perceived and objective built-environment attributes of workplace neighbourhoods. Self-reported daily average sitting time at work, in cars and in public transport was measured using a Japanese validated questionnaire. Linear regression models estimated the associations of workplace neighbourhood built-environment attributes with sitting time.

Results: All perceived workplace neighbourhood built-environment attributes were positively correlated with Walk Score®. However, statistically significant associations with Walk Score® were found for sitting for transport but not for sitting at work. Workers who perceived their workplace neighbourhoods to be more walkable reported a longer time sitting at work and in public transport but a shorter sitting time in cars.

Discussion: Our findings suggest that walkable workplace neighbourhoods may discourage longer car use but have workplaces where workers spend a long time sitting at work. The latter finding further suggests that there may be missed opportunities for desk-based workers to reduce sitting time. Future workplace interventions to reduce sitting time may be developed, taking advantage of the opportunities to take time away from work in workplace neighbourhoods.

Lin et al. 2022.

Scientific Reports, vol. 12, no. 1.

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Keywords: Workplace; neighbourhood built-environment attributes; sitting at work; desk-based workers.

Evidence Level: 5B

Link: <https://www.nature.com/articles/s41598-021-03071-8>

Musculoskeletal Health

Barriers to applying for medical rehabilitation: a time-to-event analysis of employees with severe back pain in Germany

Background: Longitudinal studies on barriers to applying for rehabilitation in Germany are lacking in light of the suspected underutilization of rehabilitation services. The aim of this study was to examine application behaviour in persons with disabling back pain and to identify relevant predictors for making an application.

Design: A prospective cohort study with randomized sampling of insurants in the German Pension Insurance, using a questionnaire at baseline and follow-up with linked administrative data for 1.5 years.

Subjects/patients: Employed persons (age range 45-59 years) with a high degree of limitations due to back pain and a self-reported risk of permanent work disability (not applied for disability pension, no medical rehabilitation within the last 4 years). **Methods:** Multivariable Cox regression was used to examine the influence of pre-selected variables on making an application in the follow-up period. **Results:** Of 690 persons, only 12% applied for rehabilitation. Predictors for making an application were: support from physicians (hazard ratio (HR)=2.24; 95% confidence interval (95% CI) 1.32-3.80), family, and friends (HR=1.67; 95% CI 1.02-2.73), more pain-related disability days (HR=1.02; 95% CI 1.01-1.03), and worse work ability (HR=0.86; 95% CI 0.75-0.97). An intention to apply at baseline mediated the effect of family and physician support on the application. **Conclusion:** The low number of applications for rehabilitation despite disabling back pain indicates access barriers to, and underuse of, medical rehabilitation.

Zimmer et al. 2022.

Journal of Rehabilitation Medicine, vol. 12.

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Keywords: Back pain; Medical rehabilitation; Rehabilitation; Germany

Evidence Level: 4B

Link: <https://medicaljournalssweden.se/jrm/article/view/1408>

Prevalence of upper limb musculoskeletal disorders and its associated risk factors among janitorial workers: A cross-sectional study

Background: Janitorial workers are considered a high-risk group to develop WRMSDs based on their numerous hazardous job tasks and frequent non-fatal injuries being reported. This study aimed to determine the prevalence of upper limb musculoskeletal disorders (ULMSDs) and its associated risk factors among janitorial workers. **Methods:** This cross-sectional study involved janitorial workers in a university in Sabah, Malaysia. The participants, who included supervisors, cleaners, and landscape workers, were recruited via universal sampling. Those with at least 12-months of experience in their present employment were included, while those with prior musculoskeletal injuries were excluded. Data were collected through interviews using the Malay version of Standardized Nordic Musculoskeletal Questionnaire (SNMQ), and Job Content Questionnaire (JCQ), followed by Ergonomic Risk Assessment (ERA). Data were analyzed and produced using SPSSv.26, encompassing descriptive statistics, Pearson's Chi-Square, and Multiple Logistic Regression analysis. Ethical approval and respondents' informed consents were obtained prior to the study. **Results:** Among 142 respondents, ULMSDs were found to be prevalent in 76.8% of janitorial workers, with the highest prevalence (71.6%) reported in the shoulder regions. None was at negligible risk, with 95.1% in the medium or high-risk categories for RULA assessment. The significant associated factors were landscape workers [aOR = 3.07, 95% CI = 1.04, 9.91], more than three years of employment [aOR = 2.47, 95% CI = 1.06, 5.79], and low job control [aOR = 2.69, 95% CI = 1.16, 6.23]. **Conclusions:** Given the high prevalence of ULMSDs, risky awkward postures, and low job control, amendments in working apparatuses and improvements in administrative procedures, are highly recommended to prevent the occurrence of ULMSDs.

Lim et al. 2022.

Annals of Medicine and Surgery, vol. 73.

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Keywords: Awkward postures; Janitorial workers; Job control; Prevalence; Upper limb musculoskeletal disorders

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2049080121011511?via%3Dihub>

Therapeutic and preventive efficacy of an intervention on workers in a back school

Background: Back pain and its ailments are the main cause of absenteeism and sick leave. Furthermore, the cause of pain and disability in a large number of workers is unknown, and treatments are not effective in controlling it. For this reason, the Back Schools (BSs) provide theoretical and practical training to workers so that they can acquire knowledge and skills that will allow them to adequately manage their back problems, enabling them to recover their autonomy and prevent relapses. **Methods:** The aim of the study is to analyse

the efficacy of a BS by means of the evaluation of pain and disability scales in workers in different sectors and in construction. The most important clinical benefits obtained after the intervention of a BS are the reduction of pain and disability. **Results:** Statistically significant and clinically relevant results have been observed between the initial assessment and the 6-month review. BS has been shown to be effective in reducing low back and neck pain and disability during the first 6 months of follow-up. **Discussion:** Construction workers have pain and disability rates at the overall mean and with improvements between the initial assessment and the 6-month review. Their rates of improvement are clinically more relevant than for the overall population analysed.

Rodríguez et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: Back school; Dorsolumbar pathology; Intervention study with follow up; Pain and disability; Work absenteeism and disability

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/2/1000>

The role of machine learning in the primary prevention of work-related musculoskeletal disorders: A scoping review

Background and Methods: To determine the applications of machine learning (ML) techniques used for the primary prevention of work-related musculoskeletal disorders (WMSDs), a scoping review was conducted using seven literature databases. **Results:** Of the 4,639 initial results, 130 primary research studies were deemed relevant for inclusion. Studies were reviewed and classified as a contribution to one of six steps within the primary WMSD prevention research framework by van der Beek et al. (2017). ML techniques provided the greatest contributions to the development of interventions (48 studies), followed by risk factor identification (33 studies), underlying mechanisms (29 studies), incidence of WMSDs (14 studies), evaluation of interventions (6 studies), and implementation of effective interventions (0 studies). Nearly a quarter (23.8%) of all included studies were published in 2020. **Discussion:** These findings provide insight into the breadth of ML techniques used for primary WMSD prevention and can help identify areas for future research and development.

Chan et al. 2022.

Applied Ergonomics, vol. 98.

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Keywords: Artificial intelligence; Classification; Cluster analysis; Occupational injury; Prediction.

Evidence Level: 6A

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0003-6870\(21\)00221-0](https://linkinghub.elsevier.com/retrieve/pii/S0003-6870(21)00221-0)

The association between work-related physical and psychosocial factors and musculoskeletal disorders in healthcare workers: Moderating role of fear of movement

Background: Knowledge is lacking on the interaction between fear of movement (FOM) and work-related physical and psychosocial factors in the development and persistence of musculoskeletal disorders (MSDs).

Methods: In this cross-sectional study, 305 healthcare workers from several Belgian hospitals filled out a questionnaire including sociodemographic factors, work-related factors (social support, autonomy at work, workload, and physical job demands), FOM, and MSDs for different body regions during the past year. Path analysis was performed to investigate (1) the association between the work-related factors, FOM and MSDs, and (2) the moderating role of FOM on the association between the work-related factors and MSDs among healthcare workers. **Results:** Complaints were most frequently located at the neck-shoulder region (79.5%) and lower back (72.4%). Physical job demands (odds ratio [OR] 2.38 and 95% confidence interval [CI] 1.52-3.74), autonomy at work (OR 1.64 CI [1.07-2.49]) and FOM (OR 1.07 CI [1.01-1.14] and OR 1.12 CI [1.06-1.19]) were positively associated with MSDs. Healthcare workers who experienced high social support at work (OR 0.61 CI [0.39-0.94]) were less likely to have MSDs. Fear of movement interacted negatively with workload (OR 0.92 CI [0.87-0.97]) and autonomy at work (OR 0.94 CI [0.88-1.00]) on MSDs.

Conclusions: Work-related physical and psychosocial factors as well as FOM are related to MSDs in

healthcare workers. FOM is an important moderator of this relationship and should be assessed in healthcare workers in addition to work-related physical and psychosocial factors to prevent or address MSDs.

Keyaerts et al. 2022.

Journal of Occupational Health, vol. 64, no. 1.

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Keywords: Fear avoidance; Fear of movement; Pain beliefs; Pain cognitions; Physical job demands; Work-related psychosocial factors

Evidence Level: 4B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/1348-9585.12314>

COVID 19

Adapting to the Future of Work

A cross-sectional study of psychosocial factors and sickness presenteeism in Japanese workers during the COVID-19 pandemic

Background: We examined the association between socioeconomic and health status, and lifestyle and sickness presenteeism among Japanese workers during the COVID-19 epidemic. **Methods:** A cross-sectional study using an Internet-monitor survey was conducted in December, 2020 in Japan. Of 33,302 survey participants, we analyzed 27,036 participants (13,814 men and 13,222 women) who reported experience with sickness presenteeism. **Results:** The odds ratio (OR) of sickness presenteeism associated with unmarried versus married status was 1.15. Respective figures for other variables were 1.11 for manual laboring work compared to desk work; 1.79 and 2.29 for loss of employment at the time the pandemic began and continuation of unemployment compared with maintaining employment during the pandemic; and 3.34 for a feeling of financial instability compared with stability. **Conclusion:** The issue of sickness presenteeism has become more prominent under the COVID-19 epidemic.

Masuda et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 1.

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

Keywords: Absenteeism; Sickness; Japanese; COVID-19; Psychosocial

Evidence Level: 4B

Link:

https://journals.lww.com/joem/Fulltext/2022/01000/A_Cross_Sectional_Study_of_Psychosocial_Factors.15.aspx

Employment consequences of COVID-19 for people with disabilities and employers

Background: The COVID-19 pandemic has disproportionately affected the lives of people with disabilities (PWD). How the pandemic affects the employment of PWD and employers has yet to be determined. We aimed to investigate the employment consequences of the pandemic as experienced by PWD and employers. The research questions were: (1) What employment effects do PWD experience, and what business changes do employers encounter as a result of the COVID-19 pandemic? (2) What challenges have PWD encountered during the pandemic? **Methods:** Cross-sectional online surveys of 733 PWD and 67 employers in the Midwestern United States. Results Compared to non-disabled peers, PWD encountered more challenges in employment during the pandemic. We found high percentages of both employers and PWD experiencing employment changes and business shutdown during the pandemic. For PWD whose employment was not affected, 14.6% of the participants (n = 107) expected a loss of income and worried about the economic uncertainty of the pandemic. Unemployment for PWD is high due to illness or disability, being laid-off or furloughed, business reductions, and not feeling safe to work. However, only about 18.6% of unemployed PWD (n = 16) received pay or benefits for the time they were not working

even though more than half filed for unemployment benefits. **Conclusions:** The pandemic adversely affected employment of PWD as reported by workers and employers. Findings parallel the experience of the non-disabled workforce, but reveal vulnerabilities that reflect disability consequences and the need for job accommodations. Results reveal emergent needs for policy supports to reduce the disparities experienced by PWD in the workplace.

Wong et al. 2022.

Journal of Occupational Rehabilitation, vol. 17, no. 1-9.

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Keywords: COVID-19; Disabled persons; Employment; Return to work

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-10012-9>

An automatic system to monitor the physical distance and face mask wearing of construction workers in COVID-19 pandemic

Background: The COVID-19 pandemic has caused many shutdowns in different industries around the world. Sectors such as infrastructure construction and maintenance projects have not been suspended due to their significant effect on people's routine life. In such projects, workers work close together that makes a high risk of infection. The World Health Organization recommends wearing a face mask and practicing physical distancing to mitigate the virus's spread. In this paper, we developed a computer vision system to automatically detect the violation of face mask wearing and physical distancing among construction workers to assure their safety on infrastructure projects during the pandemic. **Methods:** For the face mask detection, we collected and annotated 1000 images, including different types of face mask wearing, and added them to a pre-existing face mask dataset to develop a dataset of 1853 images and increased the dataset to 3300 images by data augmentation. Then, we trained and tested multiple Tensorflow state-of-the-art object detection models on the face mask dataset and chose the Faster R-CNN Inception ResNet V2 network that yielded the accuracy of 99.8%. For physical distance detection, we employed the Faster R-CNN Inception V2 to detect people. A transformation matrix was used to eliminate the camera angle's effect on the object distances on the image. The Euclidian distance used the pixels of the transformed image to compute the actual distance between people. A threshold of six feet was considered to capture physical distance violation. We also used transfer learning for training the model. **Results and Discussion:** The final model was applied on four videos of road maintenance projects in Houston, TX, that effectively detected the face mask and physical distance. We recommend that construction owners use the proposed system to enhance construction workers' safety in the pandemic situation.

Razavi et al. 2022.

SN Computer Science, vol. 3, no. 1.

User License: *PMC Open Access Subset*

Keywords: Construction Sites; Deep Learning; Facemask Detection; Faster RCNN; Social Distance Detection

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8554503/>

Occupation and COVID-19 diagnosis, hospitalisation and ICU admission among foreign-born and Swedish-born employees: a register-based study

Background: Research on occupation and risk of COVID-19 among foreign-born workers is lacking. We investigated whether working in essential occupations was associated with COVID-19 diagnosis, hospitalisation and intensive care unit (ICU) admission and whether foreign-born workers in similar occupations as Swedish-born individuals had a higher risk of the studied outcomes. **Methods:** Occupational data (2018-2019) of 326 052 employees (20-65 years) who were resident in Sweden as of 1 January 2020 were linked to COVID-19 data registered from 1 January 2020 to 28 February 2021. We analysed the risk of COVID-19 outcomes in different occupational groups and in four immigrant/occupation intersectional groups using Cox proportional hazards regression with adjustments for sociodemographic and socioeconomic characteristics and pre-existing comorbidities. **Results:** We identified 29797, 1069 and 152 cases of COVID-19 diagnosis, hospitalisations and ICU admissions, respectively, in our cohort. Workers in essential occupations had an elevated risk of COVID-19 diagnosis, hospitalisation, and ICU admissions.

Healthcare workers had a higher risk of all the outcomes compared with other essential workers. Relative to Swedish-born workers in non-essential occupations, foreign-born workers in essential occupations had 1.85 (95% CI 1.78 to 1.93), 3.80 (95% CI 3.17 to 4.55) and 3.79 (95% CI 2.33 to 6.14) times higher risk of COVID-19 diagnosis, hospitalisation and ICU admission, respectively. The corresponding risks among Swedish-born workers in essential occupations were 1.44 (95% CI 1.40 to 1.49), 1.30 (95% CI 1.08 to 1.56) and 1.46 (95% CI 0.90 to 2.38). **Conclusion:** Occupation was associated with COVID-19 outcomes and contributed to the burden of COVID-19 among foreign-born individuals in this study.

Nwaru et al. 2022.

Journal of Epidemiology and Community Health, vol. 7.

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Keywords: COVID-19; Epidemiology; Public health

Evidence Level: 4B

Link: <https://jech.bmj.com/content/early/2022/01/07/jech-2021-218278.long>

The impact of Covid-19 on unemployment across Italy: Consequences for those affected by psychiatric conditions

Background: Severe psychological and psychosocial consequences of the COVID-19 pandemic are expected, especially for people already vulnerable to biological or psychosocial stressors, including those with mental health problems. The study aimed to investigate factors associated with the loss of jobs and unemployment during the COVID-19 pandemic. In particular, we investigated whether mental illness was associated with a higher risk of losing one's job because of the COVID-19 pandemic. **Methods:** Nineteen thousand four hundred ninety-six adults living in Italy were administered an online protocol including a sociodemographic checklist and questionnaires investigating suicide ideation and risk, mental health status and general distress (stress, anxiety, and depression), resilience, and perceived support. **Results:** One thousand two hundred seventy-four reported having lost their job because of the COVID-19 pandemic, and 5.4% of the sample reported a mental illness (mostly a depressive disorder). Unemployment was independently associated with mental illness, poor mental health, and depression. Mental illness was associated with the risk of losing one's job because of the COVID-19 pandemic, but not at the multivariate analyses. Those who lost their job because of the COVID-19 pandemic (compared to others) reported worse mental health and depression. **Limitations:** The presence of mental illness was self-reported by respondents and the administered measures were self-reported questionnaires affected by social desirability and other response bias. **Conclusions:** The COVID-19 pandemic and social isolation measures and lockdown used to contain its spread among the Italian population were associated with occupational insecurity, especially among the more vulnerable social categories.

Pompili et al. 2022.

Journal of Affective Disorders, vol. 296, no. 59-66.

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Keywords: COVID-19 pandemic; Depression; Mental illness; Unemployment

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0165032721009940?via%3Dihub>

Treatment interruption is a risk factor for sickness presenteeism: A large-scale cross-sectional study during the COVID-19 pandemic

Objectives: This study examined the relationship between interruption to routine medical care during the coronavirus disease 2019 pandemic and sickness presenteeism among workers in Japan. **Methods:** A cross-sectional study using data obtained from an internet monitor questionnaire was conducted. Interruption to medical care was defined based on the response "I have not been able to go to the hospital or receive treatment as scheduled." The fraction of sickness presenteeism days in the past 30 days was employed as the primary outcome. A fractional logit model was used for analysis to treat bounded data. **Results:** Of the 27 036 participants, 17 526 (65%) were workers who did not require routine medical care, 8451 (31%) were using medical care as scheduled, and 1059 (4%) experienced interrupted medical care. The adjusted odds ratio (aOR) of sickness presenteeism was significantly higher among workers who experienced interrupted

medical care (3.44; 95% confidence interval [CI]: 3.04-3.89) than those who did not require routine medical care. In terms of symptoms, the highest aOR was observed among workers with mental health symptoms (aOR: 5.59, 95% CI: 5.04-6.20). **Conclusions:** This study suggests the importance of continuing necessary treatment during a pandemic to prevent presenteeism.

Okawara et al. 2022.

Journal of Occupational Health, vol. 64, no. 1.

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

Keywords: COVID-19; Occupational health; Patient dropouts; Presenteeism; Regression analysis

Evidence Level: 4B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/1348-9585.12313>

The relationship between telework from home and employee health: a systematic review

Background: Globalization and technological progress have made telework arrangements such as telework from home (TWFH) well-established in modern economies. TWFH was rapidly and widely implemented to reduce virus spread during the Coronavirus disease (COVID-19) pandemic, and will probably be widespread also post-pandemic. How such work arrangements affect employee health is largely unknown. Main objective of this review was to assess the evidence on the relationship between TWFH and employee health. **Methods:** We conducted electronic searches in MEDLINE, Embase, Amed, PsycINFO, PubMed, and Scopus for peer-reviewed, original research with quantitative design published from January 2010 to February 2021. Our aim was to assess the evidence for associations between TWFH and health-related outcomes in employed office workers. Risk of bias in each study was evaluated by the Newcastle-Ottawa Scale and the collected body of evidence was evaluated using the the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. **Results:** We included 14 relevant studies (22,919 participants) reporting on 28 outcomes, which were sorted into six outcome categories (general health, pain, well-being, stress, exhaustion & burnout, and satisfaction with overall life & leisure). Few studies, with many having suboptimal designs and/or other methodological issues, investigating a limited number of outcomes, resulted in the body of evidence for the detected outcome categories being GRADED either as low or very low. **Conclusions:** The consisting evidence on the relationship between TWFH and employee health is scarce. The non-existence of studies on many relevant and important health outcomes indicates a vast knowledge gap that is crucial to fill when determining how to implement TWFH in the future working life.

Lunde et al. 2022.

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

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Keywords: Burnout; E-work; Exhaustion; General health; Leisure satisfaction; Life satisfaction; Pain; Satellite work, remote work; Stress; Well-being; Working from home

Evidence Level: 1A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12481-2>

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

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

Islam 2022.

Geoforum, vol. 128.

User License: Elsevier Connect COVID-19 resource centre

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

Evidence Level: 6B

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

Study on residential environment and workers' personality traits on productivity while working from home

Background: Working from home has drawn more attention with the development of information and communications technology and the coronavirus disease 2019 pandemic. Although studies on working from home have been conducted in various academic fields, few have focused on residential environment and personality traits. **Methods:** In the present study, air temperature and humidity of the home workplace were measured and a questionnaire survey was conducted to understand the relationship between residential environment and personality traits and at-home work productivity. **Results:** The results suggest that comprehensive productivity while working from home improved. However, when examining individual aspects of productivity, the productivity of information processing improved while that of knowledge processing and knowledge creation deteriorated. The results also suggest the importance of improving the residential environment when working from home because productivity while working from home rather than from the office improved with high evaluation of the residential environment. Moreover, productivity decreased for workers with high neuroticism and increased for those with high openness or perseverance and passion, suggesting that some personality traits are more or less suitable for working from home.

Discussion: To improve the productivity of all workers, these findings have practical implications for promoting appropriate maintenance of the residential environment and introducing flexible work styles that account for personality traits.

Kawakubo et al. 2022.

Building and Environment, vol. 212

User License: Elsevier Connect COVID-19 resource centre

Keywords: COVID-19; information and communications technology; indoor environmental quality; Personality traits; Productivity; Residential environment; standard effective temperature; Japanese version of the Ten-Item Personality Inventory; Telework; Working from home

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8755452/>

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

Background and objective: The COVID-19 pandemic and the measures taken by governments to contain it have affected many aspects of the daily lives of citizens. This study aimed to describe changes in the productivity of paid work and time allocation to paid and unpaid work and leisure resulting from working at home during the pandemic. **Methods:** A sample of 851 people from the Netherlands who had paid work (≥ 24 h/week) and worked at least 4 hours per week extra at home because of lockdown measures completed a questionnaire during the first COVID-19 lockdown (April 2020). Respondents reported time spent on paid and unpaid work and leisure before and during the lockdown. Productivity was measured in terms of quantity and quality of paid work. **Results:** On average, respondents spent less time (14%) on paid work and productivity decreased 5.5%. Changes in productivity were associated with the age of children, net income and having a separate home office. Respondents spent more time on unpaid work (27%) and leisure (11%). Women spent more time on unpaid work in absolute but not in relative terms. People with a partner and with children spent more time on unpaid work and less time on leisure.

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

Huls et al. 2022.

Pharmaceutics, vol. 40, no. 1.

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

Keywords: COVID-19; Pandemic; Productivity; Paid work; Unpaid work

Evidence Level: 5B

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

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

Background: Of the 22.8 million coronavirus disease 2019 (COVID-19) cases recorded in the United States as of March 21, 2021 with age information, three-fourths were in the workingage group, indicating the potentially high economic impact of the pandemic. This study estimates the cost of lost work hours associated with the COVID-19 pandemic between March 2020 through February 2021. **Method:** I used a before-and-after analysis of data from the 2017-2021 Current Population Survey to estimate the costs of lost work hours due to economic, workers' own health, and other reasons, from the COVID-19 pandemic. **Results:** Across March 2020 through February 2021 (a year since the start of the pandemic in the United States), the estimated cost of lost work hours associated with the COVID-19 pandemic among US full-time workers was \$138 billion (95% confidence interval [CI]: \$73.4 billion-\$202.46 billion). Shares of the costs attributed to economic, workers' own health, and other reasons were 33.7%, 13.7%, and 52.6%, respectively. **Conclusion:** The \$138 billion cost of lost work hours associated with the COVID-19 pandemic during March 2020 through February 2021 highlights the economic consequences of the pandemic, as well as indicating the potential benefit of public health and safety interventions used to mitigate COVID-19 spread.

Asfaw. 2022.

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

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

Keywords: COVID-19; CPS; Lost work hours

Evidence Level: 5B

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

Striking a balance between work and play: The effects of work-life interference and burnout on faculty turnover intentions and career satisfaction

Background: The interactions between work and personal life are important for ensuring well-being, especially during COVID-19 where the lines between work and home are blurred. Work-life interference/imbalance can result in work-related burnout, which has been shown to have negative effects on faculty members' physical and psychological health. Although our understanding of burnout has advanced considerably in recent years, little is known about the effects of burnout on nursing faculty turnover intentions and career satisfaction. **Objective:** To test a hypothesized model examining the effects of work-life interference on nursing faculty burnout (emotional exhaustion and cynicism), turnover intentions and, ultimately, career satisfaction. **Design:** A predictive cross-sectional design was used. **Settings:** An online national survey of nursing faculty members was administered throughout Canada in summer 2021. **Participants:** Nursing faculty who held full-time or part-time positions in Canadian academic settings were invited via email to participate in the study. **Methods:** Data were collected from an anonymous survey housed on Qualtrics. Descriptive statistics and reliability estimates were computed. The hypothesized model was tested using structural equation modeling. **Results:** Data suggest that work-life interference significantly increases burnout which contributes to both higher turnover intentions and lower career satisfaction. Turnover intentions, in turn, decrease career satisfaction. **Conclusions:** The findings add to the growing body of literature linking burnout to turnover and dissatisfaction, highlighting key antecedents and/or drivers of burnout among nurse academics. These results provide suggestions for suitable areas for the development of interventions and policies within the organizational structure to reduce the risk of burnout during and post-COVID-19 and improve faculty retention.

Boamah et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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

Keywords: COVID-19; Burnout; Career satisfaction; Faculty shortage; Nursing faculty; Turnover intentions; Work environment; Work-life interference

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/2/809>

Guiding and Supporting Mental Health and Wellbeing

Learning from work-from-home issues during the COVID-19 pandemic: Balance speaks louder than words

Background: During the 2019 novel coronavirus disease (COVID-19) pandemic, many employees have switched to working from home. Despite the findings of previous research that working from home can improve productivity, the scale, nature, and purpose of those studies are not the same as in the current situation with the COVID-19 pandemic. **Methods:** We studied the effects that three stress relievers of the work-from-home environment—company support, supervisor's trust in the subordinate, and work-life balance—had on employees' psychological well-being (stress and happiness), which in turn influenced productivity and engagement in non-work-related activities during working hours. In order to collect honest responses on sensitive questions or negative forms of behavior including stress and non-work-related activities, we adopted the randomized response technique in the survey design to minimize response bias. **Results:** We collected a total of 500 valid responses and analyzed the results with structural equation modelling. We found that among the three stress relievers, work-life balance was the only significant construct that affected psychological well-being. Stress when working from home promoted non-work-related activities during working hours, whereas happiness improved productivity. Interestingly, non-work-related activities had no significant effect on productivity. **Discussion:** The research findings provide evidence that management's maintenance of a healthy work-life balance for colleagues when they are working from home is important for supporting their psychosocial well-being and in turn upholding their work productivity.

Chu et al. 2022.

PLoS One, vol. 17, no. 1.

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Keywords: Work from home; COVID-19; Balance; Productivity

Evidence Level: 5A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0261969>

Profiling office workers based on their self-reported preferences of indoor environmental quality and psychosocial comfort at their workplace during COVID-19

Background: Due to the COVID-19 pandemic, a large number of office workers were required to conduct their work from home. Little is known about the indoor environmental quality (IEQ) preferences and psychosocial comfort preferences of staff working from home. Therefore this study aimed to cluster office workers working at home based on their self-reported preferences for IEQ and psychosocial comfort at their most used workspace and to identify these preferences and needs of workers during the COVID-19 pandemic. **Methods:** A questionnaire was administered to employees of ten offices in the Netherlands, and the 502 respondents were clustered with two models by using TwoStep cluster analysis. The first model was based on variables related to IEQ preferences, while the second was to psychosocial comfort preferences. **Results:** The analysis revealed four IEQ clusters and six psychosocial comfort clusters. Comparison of these results with other similar studies proposed that the prevalence of anxiety, depression, migraine, and rhinitis, increased for this population during the work-from-home period of the pandemic. **Discussion:** Further results suggest that both IEQ and psychosocial comfort preferences are situation- and gender-dependent.

Ortiz et al. 2022.

Building and Environment, vol. 1, no. 211.

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

Keywords: COVID-19; Health and comfort; Preferences and needs; Workplace

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8719922/>

What are work-related predictors of post-COVID-19 home and family work roles? A cross-sectional survey

Background: To determine the extent to which pre-and post-COVID-19 work-related factors can explain post-COVID-19 home and family work roles. **Methods:** This study was a cross-sectional survey. The primary outcome measure was the Home and Family Work Roles Questionnaire. Descriptive statistical methods and multiple regression analyses were run. The significant predictors were further probed in a one-way analysis of covariance (ANCOVA) model with a Tukey posthoc correction. **Results:** In our sample of 1447 participants, the two significant predictors of post-COVID-19 home and family work roles were pre-pandemic paid job status ($F [3, 1401] = 5.66, P < 0.001$), and pre-COVID-19 home and family work roles ($F [1, 1401] = 2509.26, P < 0.001$). **Conclusion:** Greater pre-pandemic home and family role responsibilities, full-time and part-time employment pre-COVID-19 were associated with greater post-COVID-19 home and family responsibilities.

Dabbagh et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 1.

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Keywords: COVID-19; Work; Family; Roles

Evidence Level: 4B

Link:

https://journals.lww.com/joem/Fulltext/2022/01000/What_Are_Work_Related_Predictors_of_Post_COVID_19.4.aspx

Relationships between occupational stress, change in work environment during the COVID-19 pandemic, and depressive and anxiety symptoms among non-healthcare workers in Japan: A Cross-Sectional Study

Background: This study aims to clarify the effect of occupational stress and changes in the work environment on non-healthcare workers' (HCWs) mental health during the third wave of the COVID-19 pandemic in Japan. **Methods:** A web-based, cross-sectional survey was conducted from 16 to 17 December 2020. Data from 807 non-HCWs were included. We evaluated occupational stress using the Generic Job Stress Questionnaire (GJSQ). Depressive and anxiety symptoms were assessed using the Japanese version of the Patient Health Questionnaire-9 and the Generalized Anxiety Disorder 7-item scale, respectively. We collected demographic variables, work-related variables, and the variables associated with COVID-19. The adjusted odds ratios for depressive and anxiety groups were estimated using multivariate logistic regression analyses, adjusted for all the demographic variables, work-related variables, COVID-19-related variables, and the six subdivided GJSQ subscales. **Results:** The results confirm a relationship between variance in workload, job future ambiguity, social support from coworkers, having contact with COVID-19 patients, and depressive and anxiety symptoms. **Discussion:** Paying attention to job future ambiguity, the variance in workload at the workplace and individual perspectives, promoting contact and support among coworkers using online communication tools, and reducing contact with COVID-19 patients, will be useful for decreasing the depressive and anxiety symptoms among non-HCWs.

Deguchi et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 2.

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Keywords: COVID-19; Anxiety symptoms; Depressive symptoms; Job future ambiguity; Mental health; Non-healthcare workers; Occupational stress; Variance in workload

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/2/983>

Characteristics of those most vulnerable to employment changes during the COVID-19 pandemic: a nationally representative cross-sectional study in Wales

Background: The public health response to the SARS-CoV-2 (COVID-19) pandemic has had a detrimental impact on employment and there are concerns the impact may be greatest among the most vulnerable. We examined the characteristics of those who experienced changes in employment status during the early months of the pandemic. **Methods:** Data were collected from a cross-sectional, nationally representative household survey of the working age population (18-64 years) in Wales in May/June 2020 (n=1379). We looked at changes in employment and being placed on furlough since February 2020 across demographics, contract type, job skill level, health status and household factors. χ^2 or Fisher's exact test and multinomial logistic regression models examined associations between demographics, subgroups and employment outcomes. **Results:** Of our respondents, 91.0% remained in the same job in May/June 2020 as they were in February 2020, 5.7% were now in a new job and 3.3% experienced unemployment. In addition, 24% of our respondents reported being placed on furlough. Non-permanent contract types, individuals who reported low mental well-being and household financial difficulties were all significant factors in experiencing unemployment. Being placed on 'furlough' was more likely in younger (18-29 years) and older (60-64 years) workers, those in lower skilled jobs and from households with less financial security. **Conclusion:** A number of vulnerable population groups were observed to experience detrimental employment outcomes during the initial stage of the COVID-19 pandemic. Targeted support is needed to mitigate against both the direct impacts on employment, and indirect impacts on financial insecurity and health.

Gray et al. 2022.

Journal of Epidemiology and Community Health, vol. 76, no. 1.

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Keywords: COVID-19; Employment; Health inequalities; Social inequalities; Unemployment

Evidence Level: 4B

Link: <https://jech.bmj.com/content/76/1/8.long>

Enabling Healthy and Safe Workplaces

Characteristics of COVID-19 infection clusters occurring among workers in several Asia-Pacific countries

Background: The types of workplaces and occupations with coronavirus 2019 (COVID-19) clusters vary between countries and periods. We aimed to characterize major occupational groups with mass outbreaks of COVID-19 infections in several Asia-Pacific countries. **Methods:** Data on the major occupations or workplaces reporting COVID-19 cases in workplaces from January 2020 to July 2021 was collected from industrial hygiene professionals in nine countries. The proportion of workers accounted for 39.1 to 56.6% of the population in each country. The number of workers covered in the national statistics varies among nations based on their definition of a worker. **Results:** None of the countries examined here have systematically collected occupational data on COVID-19 illnesses and deaths classified by type of industry, occupation, or job. Most countries experienced COVID-19 clusters among health and social care workers (HSCW) in hospitals or long-term care facilities. The types of occupations or workplaces with virus clusters in some participating countries included prisons, call centers, workplaces employing immigrants, garment facilities, grocery stores, and the military, which differed among countries, except for a few common occupations such as HSCW and those populated by immigrants. **Discussion:** Further study is necessary in order to seek ways to control infection risks, including revisions to industrial-health-related laws.

Tejamaya et al. 2022.

Industrial Health, vol. 12.

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Keywords: Asian Network of Occupational Hygiene (ANOH); COVID-19; Infection; Occupation virus cluster; Workplace

Evidence Level: 5A

Link: https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub_2021-0227/_article

The problems experienced by employees with chronic disease during the COVID-19 pandemic

Background:Chronic diseases served as a silent global epidemic before the pandemic, and individuals living with chronic disease now form one of the groups most affected by COVID-19. This study aims to determine the problems that employees with chronic disease face during the COVID-19 pandemic. **Methods:**As part of the study, data were collected from 952 individuals who live with chronic disease in Turkey. Of these, 76.6% of respondents worked for the public sector, a large majority of whom (67.7%) have worked full time during the COVID-19 pandemic. **Results:**It was found that the COVID-19 fear level of employees living with chronic disease was higher than moderate (21.061 ± 7.607). When the variables affecting the COVID-19 fear level are listed in order of relative significance, eating problems, residing in the Mediterranean region, having asthma, and working as a female employee made the greatest impact, respectively. **Discussion:** Necessary conditions of work should be provided to those living with chronic disease who could adapt themselves to working flexibly or working from home, so that they would not feel isolated from business life. This group should be provided with essential protective equipment, their working conditions must be reviewed and vaccination priority could be given to them.

Tengilimoğlu et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 1.

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Keywords: COVID-19; Turkey; Chronic diseases; Employee; Work life

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/1/578>

Safety and health management response to COVID-19 in the construction industry: A perspective of fieldworkers

Background:The COVID-19 outbreak has significantly impacted the construction industry. The pandemic can exacerbate an already dire safety and health situation in the industry and negatively impact construction employees and employers. The present study investigates the safety and health measures implemented by construction firms in the United States (US), their effectiveness and usefulness, and workers' satisfaction with these COVID-19 measures. **Methods:**A questionnaire survey was developed and distributed to construction fieldworkers in the US to collect their perspectives on the implemented COVID-19 measures in the construction industry. A total of 187 valid responses were received and analyzed to achieve the aim of the study. **Results:**Results revealed that strategies implemented to increase social distance and minimize group gathering to 10 persons in certain workstations were perceived to be substantially more effective than job-site screening strategies. Furthermore, smaller contractors implemented fewer safety measures and perceived them to be significantly less effective than those used by medium- and large-sized contractors. Fieldworkers were favorably disposed toward using technologies, such as video-conferencing apps and wearable sensing devices, to slow the spread of COVID-19 on construction job sites. **Discussion:** The present study contributes to the body of knowledge by identifying safety and health measures to mitigate the spread of COVID-19 in construction. Practically, the study findings provide valuable insights to inform the successful implementation of safety strategies in the construction industry during a pandemic. The results are crucial for industry practitioners responsible for developing and revising pre- and post-pandemic safety and health plans.

Nnaji et al. 2022.

Process Safety and Environmental Protection, vol. 159.

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

Keywords: COVID-19; Construction management; Coronavirus; Pandemic; Safety and health; Strategies; Technologies

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8766253/>

Impact of workplace on the risk of severe COVID-19

Background:Indiscriminate regional lockdowns aim to prevent the coronavirus disease 2019 (COVID-19) infection by restricting the movement of people; however, this comes with psychological, social, and economic costs. Measures are needed that complement lockdowns and reduce adverse effects. Epidemiological studies, to date, have identified high-risk populations, but not workplaces appropriate for

closure. **Methods:** This study was conducted to provide evidence-based measures that used exact and reliable follow-up data of the PCR-positive COVID-19 cases to complement lockdowns. The data are not subjected to selection or follow-up biases, since the Japanese government, by law, must register and follow all the PCR-positive cases until either recovery or death. Direct customer exposure may affect the quantity of viral inoculum received, which, in turn, may affect the risk of the severity of disease at infection. Therefore, the professions of the cases were grouped according to their frequency of direct customer exposure (FDCE) based on subjective observations, which resulted in five workplaces; hospital, school, food service, outdoor service, and indoor office being identified. Analyzing the follow-up data, we obtained precise estimates for the risk of severe disease, defined as intensive care unit (ICU) hospitalization or death, for the workplaces adjusted for age, sex, family status, and comorbidity. **Results:** Major findings are as follows: hospital and school are the lowest risk, food and outdoor services are, despite higher FDCE, safer than indoor office. Unemployed and unclear are the highest risk, despite low FDCE. These results suggest the following workplace-specific measures complementing the lockdown: school should not be closed and indiscriminate closing of food and outdoor service industries should be avoided, since it would be more effective to reinforce their efforts to promote adherence to public health guidelines among students and customers. These actions would also reduce the adverse effects of the lockdown. **Discussion:** This study is the first to address the causality between the workplaces and severe disease. We introduce FDCE and adherence to public health guidelines (APHGs) to associate the workplace characteristics with the risk of COVID-19 severity, which provided the basis for the measures complementing lockdowns.

Nakamura et al. 2022.

Frontiers in Public Health, vol. 5.

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Keywords: Lockdowns; COVID-19; Risk; Psychological; Social; Economic

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.731239/full>

A workspace typology for enterprise collaboration systems

Background: The global COVID-19 pandemic and the need for organisations to provide digital support for work-from-anywhere has put collaboration software into the centre of attention for IT managers. **Methods:** In this paper we examine (self-managed) workspaces in (integrated) Enterprise Collaboration Systems (ECS) that provide the environment for asynchronous communication and exchange of information. Our aim is to better understand how employees use the ECS to support their work. **Results:** Based on a structured literature review and an in-depth case study of an ECS user company we developed a generic typology of workspaces containing three main categories (community, team and non-work-related) and 5 different types of workspaces. The types are characterised by their purpose, characteristics and possible metrics for their identification. **Discussion:** The findings contribute to our understanding of collaborative user activity in enterprise collaboration environments and provide the basis for Social Collaboration Analytics.

Bahles et al. 2022.

Procedia Computer Science, vol. 196, no. 296-304.

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

Keywords: CSCW; Enterprise Collaboration Systems; Topology; Workspaces

Evidence Level: 6A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8746075/>

Work absence following COVID-19 vaccination in a cohort of healthcare personnel

Background: To identify rates of work absence following receipt of COVID-19 vaccine in a cohort of healthcare personnel (HCP). **Methods:** Short-term disability (STD) usage by HCP attributed to side effects of the COVID-19 vaccine was calculated for each vaccine manufacturer, job category, age group, and work region. Analysis was performed for the cohort of HCP during the initial vaccination campaign. **Results:** 4.1% of COVID-19 vaccinations generated a STD claim for lost work due to side effects, with increased STD rates after dose 2 than dose 1 (7.4% and 0.9%, respectively). Rates were higher for younger HCP and allied health staff. **Conclusions:** While side effects from mRNA vaccine dose 2 resulted in more work absence,

statistically significant geographic differences in STD suggest cultural and staffing factors may impact HCP to utilize STD following vaccination.

Breeher et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 64, no. 1.

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Keywords: Absence; COVID-19; Vaccination; Healthcare personnel

Evidence Level: 5A

Link: <https://doi.org/10.1097/JOM.0000000000002376>

SARS-CoV-2 (Covid-19) workplace temperature screening: Seasonal concerns for thermal detection in northern regions

Background: Workplace temperature screening has become standard practice during the SARS-CoV-2 pandemic. The objective was to determine the consistency of four temperature devices during exposure to simulated and actual environmental conditions reflective of a workplace. **Methods:** An infrared (IR) digital thermometer (accuracy(A) \pm 0.2), IR laser thermometer (A \pm 1), and thermal imaging camera (A \pm 0.3) were used to measure forehead and tympanic (digital only) temperatures. The first experiment was conducted in a controlled simulated environment (-20 to 20 °C) with three participants (32-YOF, 27-YOM, 20-YOF). The second experiment used actual outdoor conditions (-0.48 to 45.6 °C) with two participants (32-YOF, 27-YOM). **Results and Discussion:** The tympanic measurement was the least impacted by environmental temperature (mean(\pm SD)): simulated (36.8(\pm 0.18) °C) and actual (36.9(\pm 0.16) °C). The thermal imaging camera had the lowest RMSE values (0.81-0.97 °C), with outdoor temperatures ranging from 0 to 45 °C. Environmental temperature influenced forehead temperature readings and required a resting period in a thermoneutral environment (5-9 min (-20 to -10 °C) to immediate (15-20 °C)).

Goggins et al. 2022.

Applied Ergonomics, vol. 98.

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

Keywords: Environmental temperature; Forehead temperature; Infrared camera; Infrared thermometer; Screening protocols

Evidence Level: 5A

Link: <https://www.sciencedirect.com/science/article/pii/S0003687021002234?via%3Dihub>

Evaluating workplace safety in the oil and gas industry during the COVID-19 pandemic using occupational health and safety Vulnerability Measure and partial least square Structural Equation Modelling

Background: The study aims to apply the Partial Least Squares Structural Equation Modeling (PLS-SEM) to model workplace safety in the Oil and Gas Industry (OGI) during the COVID-19 pandemic. **Methods:** The five areas of the Occupational Health and Safety (OHS) Vulnerability Measure (e.g., Exposure to Workplace Hazards, Policies and Procedures in the Workplace, Perception on Health & Safety Culture in the Workplace, Self-Awareness in Health & Safety Procedures and Responsibilities, and Preventive Measure for Prevention of the Transmission of COVID-19 at Workplace) were considered as the constructs to be evaluated. Fifty workers from the oil and gas industry worldwide participated in the online survey, and the data were analyzed using the SmartPLS software. **Results:** The results revealed that only Perception on Health & Safety Culture was a significant factor influencing the perceived workplace safety in the OGI during the COVID-19 pandemic ($\beta = 0.603$; t -value = 3.323; p -value = 0.001). **Discussion:** The study suggested that the oil and gas companies should maintain a positive perception of health and safety culture to improve workplace safety even during the pandemic.

Guzman et al. 2022.

Cleaner Engineering and Technology, vol. 6.

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

Keywords: COVID-19; Occupational Health and Safety; Oil and Gas Industry; Partial Least Square Structural Equation Modelling; Workplace Safety

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8730645/>

Development and validation of a multi-lingual online questionnaire for surveying the COVID-19 prevention and control measures used in global workplaces

Background: Despite widespread COVID-19 vaccination programs, there is an ongoing need for targeted disease prevention and control efforts in high-risk occupational settings. This study aimed to develop, pilot, and validate an instrument for surveying occupational COVID-19 infection prevention and control (IPC) measures available to workers in diverse geographic and occupational settings. **Methods:** A 44-item online survey was developed in English and validated for face and content validity according to literature review, expert consultation, and pre-testing. The survey was translated and piloted with 890 workers from diverse industries in Canada, Ireland, Argentina, Poland, Nigeria, China, the US, and the UK. Odds ratios generated from univariable, and multivariable logistic regression assessed differences in 'feeling protected at work' according to gender, age, occupation, country of residence, professional role, and vaccination status. Exploratory factor analysis (EFA) was conducted, and internal consistency reliability verified with Cronbach's alpha. Hypothesis testing using two-sample t-tests verified construct validity (i.e., discriminant validity, known-groups technique), and criterion validity. **Results:** After adjustment for occupational sector, characteristics associated with feeling protected at work included being male (AOR = 1.88; 95% CI = 1.18,2.99), being over 55 (AOR = 2.17; 95% CI = 1.25,3.77) and working in a managerial position (AOR = 3.1; 95% CI = 1.99,4.83). EFA revealed nine key IPC domains relating to: environmental adjustments, testing and surveillance, education, costs incurred, restricted movements, physical distancing, masking, isolation strategies, and areas for improvement. Each domain showed sufficient internal consistency reliability (Cronbach's alpha ≥ 0.60). Hypothesis testing revealed differences in survey responses by country and occupational sector, confirming construct validity ($p < 0.001$), criterion validity ($p = 0.04$), and discriminant validity ($p < 0.001$). **Conclusions:** The online survey, developed in English to identify the COVID-19 protective measures used in diverse workplace settings, showed strong face validity, content validity, internal consistency, criterion validity, and construct validity. Translations in Chinese, Spanish, French, Polish, and Hindi demonstrated adaptability of the survey for use in international working environments. The multi-lingual tool can be used by decision makers in the distribution of IPC resources, and to guide occupational safety and health (OSH) recommendations for preventing COVID-19 and future infectious disease outbreaks.

Ingram et al. 2022.

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

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Keywords: COVID-19; Infection prevention and control; Occupational safety and health; Online survey; Psychometric validation

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-12500-w>

COVID-19 vaccine perceptions and uptake in a national prospective cohort of essential workers

Background: In a multi-center prospective cohort of essential workers, we assessed knowledge, attitudes, and practices (KAP) by vaccine intention, prior SARS-CoV-2 positivity, and occupation, and their impact on vaccine uptake over time. **Methods:** Initiated in July 2020, the HEROES-RECOVER cohort provided socio-demographics and COVID-19 vaccination data. Using two follow-up surveys approximately three months apart, COVID-19 vaccine KAP, intention, and receipt was collected; the first survey categorized participants as reluctant, reachable, or endorser. **Results:** A total of 4,803 participants were included in the analysis. Most (70%) were vaccine endorsers, 16% were reachable, and 14% were reluctant. By May 2021, 77% had received at least one vaccine dose. KAP responses strongly predicted vaccine uptake, particularly positive attitudes about safety (aOR = 5.46, 95% CI: 1.4-20.8) and effectiveness (aOR = 5.0, 95% CI: 1.3-19.1). Participants' with prior SARS-CoV-2 infection were 22% less likely to believe the COVID-19 vaccine was effective compared with uninfected participants (aOR 0.78, 95% CI: 0.64-0.96). This was even more pronounced in first responders compared with other occupations, with first responders 42% less likely to believe in COVID-19 vaccine effectiveness (aOR = 0.58, 95% CI 0.40-0.84). Between administrations of the two surveys, 25% of reluctant, 56% reachable, and 83% of endorser groups received the COVID-19 vaccine.

The reachable group had large increases in positive responses for questions about vaccine safety (10% of vaccinated, 34% of unvaccinated), and vaccine effectiveness (12% of vaccinated, 27% of unvaccinated).

Discussion: Our study demonstrates attitudes associated with COVID-19 vaccine uptake and a positive shift in attitudes over time. First responders, despite potential high exposure to SARS-CoV-2, and participants with a history of SARS-CoV-2 infection were more vaccine reluctant. **Conclusions:** Perceptions of the COVID-19 vaccine can shift over time. Targeting messages about the vaccine's safety and effectiveness in reducing SARS-CoV-2 virus infection and illness severity may increase vaccine uptake for reluctant and reachable participants.

Lutrick et al. 2022.

Vaccine, vol. 40, no. 3.

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Keywords: COVID-19; Vaccination; Uptake

Evidence Level: 1A

Link: <https://www.sciencedirect.com/science/article/pii/S0264410X21015930?via%3Dihub>

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

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

Oude Hengel et al. 2022.

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

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Keywords: COVID-19; Job exposure; Infection risk

Evidence Level: 5A

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

The COVID-19 pandemic: Workplace safety management practices, job insecurity, and employees' organizational citizenship behavior

Background: How do organizations and employees react to the COVID-19 pandemic? Can workplace safety management practices (WSPs) maintain employees' organizational citizenship behavior (OCB) in this time of global health crisis? Can employees' perceptions of the risk associated with COVID-19 and job insecurity mediate the WSPs-OCB relationship? Drawing upon social exchange and protection motivation theories, this research aims to answer such questions. **Methods and Results:** Analyzing the survey data from 501 Vietnamese employees using SmartPLS software, we find that WSPs positively influence the OCB and negatively influence the perceived job insecurity. Furthermore, the perceived risk associated with COVID-19 positively affects perceived job insecurity and OCB. Unexpectedly, in the context of Vietnam, a developing country with a collectivist culture, WSPs increase the employees' perceived risk associated with COVID-19

instead of reducing their fear. Also, employees' perceptions of job insecurity are not statistically correlated with OCB. In addition, we reveal a partial mediating role of the perceived risk associated with COVID-19 in the WSPs-OCB relationship. **Discussion:** This research highlights the power of WSPs as well as measures to psychologically reassure employees during the pandemics.

Vu et al. 2022.

Safety Science, vol. 145

User License: Elsevier Connect COVID-19 resource centre

Keywords: Job insecurity; Organizational citizenship behavior; Perceived risk associated with the COVID-19 pandemic; Workplace safety management practices

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8528665/>

The impact of invisible-spreaders on COVID-19 transmission and work resumption

Background: The global impact of coronavirus disease 2019 (COVID-19) is unprecedented, and many control and prevention measures have been implemented to test for and trace COVID-19. However, invisible-spreaders, who are associated with nucleic acid detection and asymptomatic infections, have received insufficient attention in the current COVID-19 control efforts. **Methods:** In this paper, we analyze the time series infection data for Italy, Germany, Brazil, India and Sweden since the first wave outbreak to address the following issues through a series of experiments. **Results and Discussion:** We conclude that: 1) As of June 1, 2020, the proportion of invisible-spreaders is close to 0.4% in Sweden, 0.8% in early Italy and Germany, and 0.4% in the middle and late stages. However, in Brazil and India, the proportion still shows a gradual upward trend; 2) During the spread of this pandemic, even a slight increase in the proportion of invisible-spreaders could have large implications for the health of the community; and 3) On resuming work, the pandemic intervention measures will be relaxed, and invisible-spreaders will cause a new round of outbreaks.

Wu et al. 2022.

PLoS One, vol. 17, no. 1.

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Keywords: COVID-19; Transmission; Prevention; Invisible-spreaders

Evidence Level: 5A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0252994>