

# Emerging Evidence Alert September 2020

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

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## Using social networking to support worker health

Embracing flexible working arrangements during COVID-19 has meant many workplaces have adopted new technologies and found new ways to connect and engage with workers. A [systematic review of ten research studies](#) provides some insight into how social media—including social networking platforms within and outside the workplace—may be useful in promoting healthy lifestyles and WHS prevention in the workplace.

With three billion users worldwide, the power and influence of social media is undeniable. More organisations are using social networking platforms to deliver business information, engage remote teams and workers, and facilitate knowledge sharing, training and education, including the adoption of safe and healthy work practices.

Although more research is needed, this latest evidence suggests that social media is promising when promoting healthy lifestyles or health information to workers. While this field of research is relatively new, there will be continued interest in this area as social networking platforms continue to play a critical role in supporting flexible working and COVID-safe transitions back to usual workplaces in Australia and around the world.

## National Safe Work Month: WHS and COVID-19

Safe Work Australia's National Safe Work Month (NSWM) will be held throughout October with events and activities to reflect this year's theme: **Work Health and Safety (WHS) through COVID-19**.

Comcare is supporting the initiative with a range of resources, guidance and the following webinars to help support employers, workers and Australian businesses:

- [Accelerated workplace change in the face of COVID-19](#) – **Thursday 8 October**.  
Co-presented with Safe Work Australia, and covering mental health, working from home, leadership and culture, new WHS risks, WHS duties, safety systems and the ongoing risk management from exposure to COVID-19.
- [COVID-19, our work, mental health and wellbeing](#) – **Wednesday 14 October**.  
Working from home and the effects associated with COVID-19, plus a look at the future impact of work.
- [COVID-19, safety systems and safety culture](#) – **Wednesday 28 October**.  
Comcare's regulatory specialists will outline the key elements of safety management systems and what makes some more effective than others.

[Visit Comcare's dedicated NSWM page](#) to access a range of resources, guidance and tools that focus on mentally healthy workplaces, COVID-safe workplaces and WHS at a worker level and leadership level. More information about National Safe Work Month is available on the [Safe Work Australia website](#).

## Description of Evidence Levels Definitions Used in This Review

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

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

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

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

## Fostering Work Participation

### Presenteeism and Absenteeism

#### **Do birthrates contribute to sickness absence differences in women? A cohort study in Catalonia, Spain, 2012-2014**

**Aims:** This study explores the differences in sickness absence trends in women according to reproductive age group and medical diagnoses. **Methods:** Data were obtained from two administrative registries: The Continuous Working Life Sample and the Catalan Institute of Medical Evaluations from 2012 to 2014, containing 47,879 female employees. Incidence rates and incidence risk ratios derived from Poisson and negative binomial models were calculated to compare sickness absence trends among reproductive age groups based on Catalan birthrates: early-reproductive (25-34 years old), middle-reproductive (35-44) and late-reproductive (45-54), according to diagnostic groups, selected diseases, type of contract, occupational category, and country of origin. **Results:** Younger women show a higher incidence of overall sickness absence compared to late-reproductive-aged women. Incidence risk ratios of sickness absence decreased significantly from early-reproductive to late-reproductive age for low back pain, hemorrhage in early pregnancy, nausea and vomiting, and abdominal and pelvic pain. **Discussion:** The higher incidence of sickness absence due to pregnancy-related health conditions in early-reproductive women compared to other reproductive age groups, may explain the sickness absence differences by age in women. Proper management of sickness absence related to pregnancy should be a goal to reduce the sickness absence gap between younger and older women.

**March et al. 2020.**

**PLoS One, vol. 15, no. 8.**

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**Keywords:** Birthrate; sickness absence; women; medical diagnosis; reproductive age.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0237794>

#### **A longitudinal exploration of the relationship between obesity, and long term health condition with presenteeism in Australian workplaces, 2006-2018**

**Background:** Obesity and long term health condition (LTHC) are major public health concerns that have an impact on productivity losses at work. Little is known about the longitudinal association between obesity and LTHC with impaired productivity. **Objective:** This study aims to explore the longitudinal association between obesity and LTHC with presenteeism or working while sick. **Design:** Longitudinal research design. **Setting:** Australian workplaces. **Methods:** This study pooled individual-level data of 111,086 employees collected in wave 6 through wave 18 from the Household, Income and Labour Dynamics in Australia (HILDA) survey. The study used a Generalized Estimating Equation (GEE) model with logistic link function to estimate the association. **Results:** The findings suggest that overweight (Odds Ratios [OR]: 1.09, 95% Confidence Interval [CI]: 1.05-1.14), obesity (OR: 1.38, 95% CI: 1.31-1.45), and LTHC (OR: 3.03, 95% CI: 2.90-3.16) are significantly positively associated with presenteeism. **Conclusions:** The longitudinal association between obesity and LTHC with presenteeism among Australian employees implies that interventions to improve workers' health and well-being will reduce the risk of presenteeism at work.

**Keramat et al. 2020.**

**PLoS One, vol. 15, no. 8.**

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**Keywords:** Obesity; health condition; presenteeism; Australian workplace.

**Evidence Level:** 4A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0238260>

#### **Job stress factors measured by Brief Job Stress Questionnaire and sickness absence among Japanese workers: A longitudinal study**

This study aimed to investigate associations between Brief Job Stress Questionnaire (BJSQ)-measured job stress factors and sickness absence in Japanese workers. Among 551 healthy, employed Japanese men and

women (age range: 21-73 years) who underwent mental health examinations at the Osaka Medical Center for Health Science and Promotion between 2006 and 2009, 197 (67 men, 130 women) consented to participate in this study. Their sickness absences until the end of March 2010 were then followed-up via postal mail survey, with 112 participants effectively responding to the question on sickness absence (56.9%). The hazard ratio (HR) and 95% confidence interval (CI) were calculated using the Cox proportional hazards model, adjusting for age, sex, and lifestyle factors. Among the 112 respondents, 12 took sickness absence after their study entry, as found during the mean 2.3 years of follow-up (258.8 person-years). Among all sickness absences, those of eight participants were because of mental illness. Physical demands were positively associated with increased risks of all sickness absence (adjusted HR: 2.78, 95% CI: 1.01-7.64). Physical demands were predictive for all sickness absence and should be alleviated at workplaces to prevent such absence.

**Hirokawa et al. 2020.**

**Fukushima Journal of Medical Science, vol. 66, no. 2.**

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**Keywords:** Depressive symptoms; job stressor; physical demands; physical environment; sickness absence.

**Evidence Level:** 4B

**Link:** [https://www.jstage.jst.go.jp/article/fms/66/2/66\\_2019-15/article](https://www.jstage.jst.go.jp/article/fms/66/2/66_2019-15/article)

### **Work-related moderators of the relationship between organizational change and sickness absence: A longitudinal multilevel study**

**Background:** A sizeable body of research has demonstrated a relationship between organizational change and increased sickness absence. However, fewer studies have investigated what factors might mitigate this relationship. The aim of this study was to examine if and how the relationship between unit-level downsizing and sickness absence is moderated by three salient work factors: temporary contracts at the individual-level, and control and organizational commitment at the work-unit level. **Methods:** We investigated the association between unit-level downsizing, each moderator and both short- and long-term sickness absence in a large Norwegian hospital (n = 21,085) from 2011 to 2016. Data pertaining to unit-level downsizing and employee sickness absence were retrieved from objective hospital registers, and moderator variables were drawn from hospital registers (temporary contracts) and the annual work environment survey (control and organizational commitment). We conducted a longitudinal multilevel random effects regression analysis to estimate the odds of entering short- (< = 8 days) and long-term (> = 9 days) sickness absence for each individual employee. **Results:** The results showed a decreased risk of short-term sickness absence in the quarter before and an increased risk of short-term sickness absence in the quarter after unit-level downsizing. Temporary contracts and organizational commitment significantly moderated the relationship between unit-level downsizing in the next quarter and short-term sickness absence, demonstrating a steeper decline in short-term sickness absence for employees on temporary contracts and employees in high-commitment units. Additionally, control and organizational commitment moderated the relationship between unit-level downsizing and long-term sickness absence. Whereas employees in high-control work-units had a greater increase in long-term sickness absence in the change quarter, employees in low-commitment work-units had a higher risk of long-term sickness absence in the quarter after unit-level downsizing. **Conclusions:** The results from this study suggest that the relationship between unit-level downsizing and sickness absence varies according to the stage of change, and that work-related factors moderate this relationship, albeit in different directions. The identification of specific work-factors that moderate the adverse effects of change represents a hands-on foundation for managers and policymakers to pursue healthy organizational change.

**Gronstad et al. 2020.**

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

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**Keywords:** Control; hospitals; moderation effects; Norway; organizational change; organizational commitment; sickness absence; temporary contracts.

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09325-w>

## Building Employer Capability

### Wellness Programs

#### **Do workplace health-promotion interventions targeting employees with poor health reduce sick-leave probability and disability rates?**

**Aims:** This study aimed to investigate whether introducing workplace health-promotion interventions targeting employees with health problems or reduced work ability affected overall sick leave and disability risk. **Methods:** The study population comprised data from an establishment survey from 2010 identifying who had introduced workplace health promotion (the intervention) linked to register data on all employees and their sickness absence and disability pension uptake from 2000 through 2010. **Results:** Interventions had moderate effects due to varying efficacy in different parts of the labour market. Intervention success was more likely among white-collar workers (e.g. in public administration) compared to blue-collar workers (e.g. in manufacturing), probably due to variations in both organisational and technological constraints. Effects were small among men and moderate among older workers, particularly among women. Overall, disability risk reduction was accompanied by an increase in sickness absence. Sometimes, sickness absence increased in groups with no change in disability risk, suggesting that presenteeism in one group may increase absenteeism in other groups. **Conclusions:** Introducing workplace health-promotion interventions may prolong work careers in some labour-market segments. Financial incentives for Norwegian establishments to continue offering workplace health-promotion interventions may be improved, given the current financial model for disability pension and sickness benefits.

**Nielson et al. 2020.**

**Scandinavian Journal of Public Health.**

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

**Keywords:** Workplace health promotion; disability; interventions; sick leave.

**Evidence Level:** 4A

**Link:** <https://journals.sagepub.com/doi/full/10.1177/1403494820946543>

#### **Pilot testing of a nudge-based digital intervention (Welbot) to improve sedentary behaviour and wellbeing in the workplace**

Welbot is a nudge-based digital intervention that aims to reduce sedentary behaviour and improve physical and mental wellbeing at work. The purpose of this study was to pilot test the Welbot intervention. Forty-one (6M/35F) University staff (M age = 43-years) participated in this study, which was a single arm repeated measures trial conducted over three weeks of intervention. The primary outcome was sedentary behaviour (measured subjectively and objectively) and secondary outcomes included: mental wellbeing, procrastination, depression, anxiety and stress, and work engagement. A subset of participants (n = 6) wore an ActivPAL to objectively measure activity data, while another subset of participants (n = 6) completed a qualitative semi-structured interview to ascertain experiences of using Welbot. Following the intervention, a Friedman non-parametric test revealed that participants self-reported significantly less time sitting and more time standing and objectively recorded more steps at the week-1 follow-up. A series of paired t-tests exhibited that changes in all secondary outcomes were in the expected direction. However, only improvements in depression, anxiety, and stress were significant. After using Welbot, thematic analysis demonstrated that participants perceived they had a positive behaviour change, increased awareness of unhealthy behaviours at work, and provided suggestions for intervention improvement. Overall, findings provided indications of the potential positive impact Welbot may have on employees' wellbeing, however, limitations are noted. Recommendations for intervention improvement including personalisation (e.g., individual preferences for nudges and the option to sync Welbot with online calendars) and further research into how users engage with Welbot are provided.

**Haile et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16.**

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**Keywords:** Behaviour change; digital health; mental health; nudge theory; occupational health; physical activity; sedentary behaviour; wellbeing; workplace.

**Evidence Level:** 5A

**Link:** <https://www.mdpi.com/1660-4601/17/16/5763>

## Organisational Issues

### **Exploring the relationships between a toxic workplace environment, workplace stress, and project success with the moderating effect of organizational support: Empirical evidence from Pakistan**

**Purpose:** Researchers have shown great interest in the relationships among a toxic workplace environment, workplace stress, and project success, which have led to an expansive body of research on the topic. In light of this work, the current study explores the effects of a toxic workplace environment (TWE) and workplace stress (WS) as determinants of project success in the renewable energy projects of Pakistan. Based on the resource-based view (RBV) theory, the study proposes and tests a model with organizational support as a moderating variable. **Research methodology:** A 30-item questionnaire survey was administered among staff of ten renewable energy project companies located in the vicinity of Karachi, Lahore, Islamabad (Pakistan). The target population was senior managers, middle-level managers, and administrative staff. Structural equation modelling was used to estimate the predictive power of the model. **Results:** A toxic workplace environment was found to have negative relationships with project success and workplace stress. Organizational support served as a moderator in the relationship between a toxic workplace environment and workplace stress and thus contributed to the success of a project. **Conclusion:** Toxic workplace environment and the resulting workplace stress have a negative effect on project success. Projects undertaken in the energy sector have tight deadlines, which create stress that leads to a range of mental and physical health problems. Workers facing these problems can ultimately suffer from such diseases as depression, anxiety, and insomnia. These issues lower morale and, thus, negatively affect productivity. The provision of organizational support can mitigate the negative effects.

**Wang et al. 2020.**

**Risk Management and Healthcare Policy, vol. 7, no. 13.**

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

**Keywords:** Organizational support; project success; toxic workplace environment; workplace stress

**Evidence Level:** 5B

**Link:** <https://www.dovepress.com/exploring-the-relationships-between-a-toxic-workplace-environment-work-peer-reviewed-article-RMHP>

## Shift Work

### **Employees with shift work disorder experience excessive sleepiness also on non-workdays: A cross-sectional survey linked to working hours register in Finnish hospitals**

A considerable proportion of shift workers have work schedule-related insomnia and/or excessive sleepiness, a phenomenon described as shift work disorder (SWD). There is yet a lack of evidence on whether or not employees recover from symptoms of SWD between work shifts. We studied whether SWD and its subtypes are associated with insomnia and excessive sleepiness during weekly non-workdays and with 24-h sleep time. Hospital employees answered a survey on SWD, insomnia and excessive sleepiness on weekly non-workdays, and 24-h sleep. To identify shift workers with night shifts (n=2,900, 18% with SWD) and SWD, we linked survey responses to employers' register on working hours. SWD included three subtypes: insomnia only (SWD-I, 4%, n=102), excessive sleepiness only (SWD-Es, 8%, n=244), and both insomnia and excessive sleepiness (SWD-IEs, 6%, n=183). Based on regression analyses, SWD was associated with excessive sleepiness on non-workdays (OR: 1.42, 95% CI: 1.07-1.88) and with insomnia on non-workdays (0.53, 0.31-0.91). SWD-I was associated with excessive sleepiness on non-workdays (2.25, 1.31-3.87) and with shorter sleep (7-7.5 h: 1.96, 1.06-3.63;  $\leq 6.5$ h: 2.39, 1.24-4.59; reference:  $\geq 8$  h). The results suggest that especially employees with SWD-I may need longer time to overcome excessive sleepiness than allowed by their roster.

**Vanttola et al. 2020.**

**Industrial Health, vol. 58, no. 4.**



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**Keywords:** Circadian rhythm sleep-wake disorder; epidemiology; health care; insomnia; international classification of sleep disorders; nurses; registry; shift work sleep disorder.

**Evidence Level:** 4B

**Link:** [https://www.istage.jst.go.jp/article/indhealth/58/4/58\\_2019-0179/article](https://www.istage.jst.go.jp/article/indhealth/58/4/58_2019-0179/article)

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

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

**Methods:** This cohort study included 45,390 working men and women aged 40-79 years and registered in the Japan Collaborative Cohort Study (JACC Study). The Cox proportional hazards models were used to calculate the hazard ratios (HRs) and their 95% confidence intervals (CIs) for incident cancer among those who reported engagement in night work and rotating shift work for their longest occupations compared with day work. **Results:** Within a median follow-up duration of 14.2 years, 2283 (9.4%) men and 1309 (4.5%) women developed cancer. Among men, rotating shift work was significantly associated with increased risk of esophageal cancer (HR= 2.47, 95% CI, 1.42-4.31) and decreased risk of liver cancer (HR= 0.54, 95% CI, 0.30-0.98). Also, rotating shift work tended to be associated with the increased risk of prostate cancer (HR= 1.42, 95% CI, 0.95-2.12). Night work and rotating shift work were not related to the risk of all-cause cancer in either sex. **Conclusion:** Rotating shift work might contribute to the increased risk of esophageal cancer and prostate cancer and the decreased risk of liver cancer among Japanese men.

**Arafa et al. 2020.**

**Journal of Epidemiology.**

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**Keywords:** Cohort study; esophageal cancer; liver cancer; night work; prostate cancer; shift work.

**Evidence Level:** 4B

**Link:** [https://www.istage.jst.go.jp/article/jea/advpub/0/advpub\\_JE20200208/article](https://www.istage.jst.go.jp/article/jea/advpub/0/advpub_JE20200208/article)

### **Work shift and circadian rhythm as risk factors for poor sleep quality in public workers from Murcia (Spain)**

The purpose of this study was to determine the prevalence of sleep quality and to investigate variables predicting the risk of poor sleep quality in public workers from Murcia (Spain). A cross-sectional and prospective study was conducted from October 2013 to February 2016 in 476 public workers. The Pittsburgh Sleep Quality Index was used to measure the quality of sleep, and the reduced scale of the Horne and Österberg Morningness-Eveningness Questionnaire was applied to analyze the circadian typology. The predictive variables of self-reported poor sleep quality were identified by multivariate logistic regression. No significant differences were found according to sex in the overall sleep quality scores ( $5 \pm 2.9$  versus  $5.1 \pm 3$ ,  $p = 0.650$ ), but there were in the duration of sleep. Three percent of females slept <5 hours compared to 2% of men ( $p = 0.034$ ). Fixed morning shifts (OR = 1.9, 95% CI 1.3-3.1;  $p = 0.007$ ) and evening chronotypes (OR = 1.6, 95% CI 1.0-2.3;  $p = 0.017$ ) were independent predictors of suffering from poor sleep quality. In conclusion, the frequency of self-reported poor sleep quality among public workers from Murcia was 37.4%. Being a public worker with a fixed morning shift and having an evening chronotype demonstrated to be associated with the quality of sleep.

**Rodríguez-González-Moro et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16.**

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**Keywords:** Circadian rhythm; public workers; sleep quality; work shift

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5881>



### **The future of shift work: Circadian biology meets personalised medicine and behavioural science**

Shift work is commonplace in modern societies, and shift workers are predisposed to the development of numerous chronic diseases. Disruptions to the circadian systems of shift workers are considered important contributors to the biological dysfunction these people frequently experience. Because of this, understanding how to alter shift work and zeitgeber (time cue) schedules to enhance circadian system function is likely to be key to improving the health of shift workers. While light exposure is the most important zeitgeber for the central clock in the circadian system, diet and exercise are plausible zeitgebers for circadian clocks in many tissues. We know little about how different zeitgebers interact and how to tailor zeitgeber schedules to the needs of individuals; however, in this review we share some guidelines to help shift workers adapt to their work schedules based on our current understanding of circadian biology. We focus in particular on the importance of diet timing and composition. Going forward, developments in phenotyping and "envirotyping" methods may be important to understanding how to optimise shift work. Non-invasive, multimodal, comprehensive phenotyping using multiple sources of time-stamped data may yield insights that are critical to the care of shift workers. Finally, the impact of these advances will be reduced without modifications to work environments to make it easier for shift workers to engage in behaviours conducive to their health. Integrating findings from behavioural science and ergonomics may help shift workers make healthier choices, thereby amplifying the beneficial effects of improved lifestyle prescriptions for these people.

**Potter et al. 2020.**

**Frontiers in Nutrition, vol. 7, no. 116.**

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**Keywords:** Chronomedicine; chrononutrition; chronotherapy; circadian disruption; light exposure; physical activity; shift work; time-restricted eating.

**Evidence Level:** 6A

**Link:** <https://www.frontiersin.org/articles/10.3389/fnut.2020.00116/full>

### **Assessing cognitive abilities of patients with shift work disorder: Insights from RBANS and granger causality connections among resting-state networks**

**Background:** Numerous studies have confirmed that long-term shift work is not only associated with increased health problems and acute impact on safety but also with impaired cognitive abilities. However, very little is known about effects of shift work on cognition-related brain resting-state networks. The aim of this study was to explore the effects of shift work disorder (SWD) on granger causality connection among resting-state brain networks. **Methods:** Thirty patients with SWD and 25 matched healthy subjects were recruited to undergo the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) and resting-state fMRI scanning. We employed independent component analysis (ICA) to extract resting-state brain networks and granger causality analysis (GCA) to characterize the difference of granger causality connection among cognition-related resting-state brain networks. **Results:** Compared with healthy subjects, patients with SWD showed impairments on the attention and immediate memory. Seven resting-state brain networks were identified, and patients with SWD showed more numerous granger causality connections in comparison with healthy subjects. Two-sample t test results showed that there were significantly increased inflows from the anterior default mode network (aDMN) to sensorimotor network (SMN) and left frontoparietal network (LFPN) to salience network (SN). Correlation analyses showed that the increased inflows from aDMN to SMN were negatively associated with the score of attention, while LFPN to SN were negatively associated with the score of visuospatial/constructional ability. **Conclusions:** This study indicates that SWD impairs cognitive performance, and the specific intrinsic brain granger causality connectivity among resting-state networks in SWD patients is affected after long-term shift works.

**Ning et al. 2020.**

**Frontiers of Psychiatry.**

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**Keywords:** Cognitive abilities; granger causality connection; resting-state functional magnetic resonance imaging; resting-state networks; shift work disorder.

**Evidence Level:** 5A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyt.2020.00780/full>

### **The moderating role of lifestyle, age, and years working in shifts in the relationship between shift work and being overweight**

**Purpose:** This study aimed to investigate the relationship between the moderating role of lifestyle, age, and years working in shifts and, shift work and being overweight. **Methods:** Cross-sectional data were used of 2569 shift and 4848 non-shift production workers who participated between 2013 and 2018 in an occupational health check. Overweight (BMI  $\geq 25$  kg/m<sup>2</sup>) was calculated using measured weight and height; lifestyle was assessed by questionnaires. Multiple-adjusted logistic regression with interaction terms between shift work and potential moderators assessed multiplicative interaction; the relative excess risk due to interaction assessed additive interaction (synergism). **Results:** Shift work was significantly related to being overweight (OR 1.53, 95% CI 1.33 1.76). The strength of this association did not differ by level of sleep quality, fruit and vegetable intake, and physical activity ( $p \geq 0.05$ ). Additive and multiplicative interaction by smoking status was present ( $p < 0.01$ ), with a stronger relationship between shift work and being overweight among non-smokers compared to smokers. Older age as well as more years of exposure to shift work were, independently from each other, related to a stronger relationship between shift work and being overweight (multiplicative interaction  $p < 0.05$ ). **Conclusion:** Shift work was to a similar extent related to being overweight among those with a healthy and unhealthy lifestyle. This does, however, not imply that shift workers can behave unhealthy without any harm. Based on the evident health benefits of a healthy lifestyle, it is still recommended to get sufficient quality of sleep and to meet the recommended level of daily physical activity and, fruit and vegetable intake.

**Hulsegge et al. 2020.**

**International Archives of Occupational and Environmental Health, vol. 93, no. 6.**

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**Keywords:** Interaction; lifestyle behaviors; moderators; night work; obesity; rotating shift system.

**Evidence Level:** 4A

**Link:** <https://link.springer.com/article/10.1007/s00420-020-01519-4>

### **Management and Leadership**

#### **Leadership quality and risk of long-term sickness absence among 53,157 employees of the Danish workforce**

**Objective:** To examine whether low leadership quality predicts long-term sickness absence (LTSA) in Denmark. **Methods:** Using Cox models, we estimated the association between exposure to low leadership quality and onset of register based LTSA (more than or equal to 6 weeks) during 12-months follow-up among 53,157 employees without previous LTSA. **Results:** During 51,155 person-years, we identified 2270 cases of LTSA. Low leadership quality predicted LTSA with a dose-response pattern after adjustment for confounders. The hazard ratio (HR) of LTSA in the lowest compared with the highest quartile of leadership quality was 1.61 (95% CI: 1.43 to 1.82). Further, change from high to low leadership quality over time predicted risk of LTSA (HR = 1.42, 95% CI: 1.02 to 1.97) compared with persistent high leadership quality. **Conclusions:** Exposure to low leadership quality is a risk factor of LTSA in the Danish workforce.

**Sørensen et al. 2020.**

**International Journal of Environmental Research and Medicine, vol. 62, no. 8.**

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**Keywords:** Sickness, absence, workforce, leadership quality, risk

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Fulltext/2020/08000/Leadership\\_Quality\\_and\\_Risk\\_of\\_Long\\_term\\_Sicknes.s.2.aspx](https://journals.lww.com/joem/Fulltext/2020/08000/Leadership_Quality_and_Risk_of_Long_term_Sicknes.s.2.aspx)

#### **The role of the unitary prevention delegates in the participative management of occupational risk prevention and its impact on occupational accidents in the Spanish working environment**

The aim of this research was to study the impact of the unitary prevention delegates (UPDs) on the Spanish working environment. To this end, a cross-sectional study was carried out using microdata from the

National Survey on Health and Safety Management in Companies (ENGE-2009) with a sample of 5147 work centres. To measure the relationship between the presence of UPD in workplaces with preventive management indicators and damage to health, individual and multiple logistic regression models were carried out, calculating the crude (cOR) and adjusted (aOR) odds ratios by sociodemographic covariates, with their corresponding 95% confidence intervals (95% CI). Ambivalent results were obtained. On the one hand, a positive impact of the UPDs was found, in the management of prevention showing a higher probability of prevention plans being carried out (aOR = 3.97; 95% CI: 3.26-4.83), risk assessments (aOR = 5.96; 95% CI: 4.44-8.01) and preventive actions were planned (aOR = 3.01; 95% CI: 2.55-3.56), as well as 1.56 times less likely to register minor occupational accidents (aOR = 0.64; 95% CI: 0.53-0.76). On the other hand, the presence of the UPDs did not promote the activation of a participatory culture and did not reduce the probability of suffering serious and fatal accidents at work. In conclusion, UPDs need to activate workers' participation to improve results.

**Castiblanquet et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16**

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**Keywords:** Accidents at work; cultural activation; preventive management; unitary prevention delegates; workers' participation.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5678>

### **Work-related identity discrepancy and counterproductive work behavior: The role of emotional exhaustion and supervisor incivility**

This research investigates the role of emotional exhaustion and supervisor incivility in explaining the relationship between work-related identity discrepancy and counterproductive work behavior. Based on resource conservation theory, our study hypothesizes a moderated mediation model that work-related identity discrepancy impacts counterproductive work behavior through emotional exhaustion, and supervisor incivility is deemed as the boundary condition in the indirect effect. Drawing on a sample of 863 employees, we found support for the moderated mediation model in which the positive relationship between work-related identity discrepancy and counterproductive work behavior was mediated by emotional exhaustion, such that the mediating relationship was strengthened for new leaders with a low level of supervisor incivility and weakened for those with high level of supervisor incivility. We further discuss the theoretical and practical implications of these findings.

**Liu et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16**

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**Keywords:** Counterproductive work behavior; emotional exhaustion; supervisor incivility; work-related identity discrepancy.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5747>

## **Work Ability**

### **Productivity losses among people with back pain and among population-based references: A register-based study in Sweden**

**Objective:** Back pain is the leading cause for years lived with disability globally and among the main reasons for sickness absence (SA) and disability pension (DP). The objective of this study was to explore the occurrence of SA and DP and to estimate productivity losses among individuals with back pain compared with among matched population-based references. **Design:** Explorative prospective cohort study using register microdata. **Participants and setting:** A total of 23,176 people, aged 19-60 years, with a first visit to inpatient or specialised outpatient healthcare for back pain (International Statistical Classification of Diseases and Related Health Problems code M54) in 2010 in Sweden and a matched population-based reference group (n=115,880). **Outcomes:** Long-term SA (in SA spells >14 days) and DP and productivity losses, measured in € (2018 prices) by multiplying the SA and DP net days by the societal cost of each such

day. **Results:** In the back-pain group, 42% had SA or DP days; in the reference group, the corresponding proportion was 15%. Productivity loss per patient with back pain was €8928 during the 12-month follow-up period; in the reference group, it was €3499 ( $p < 0.0001$ ). **Conclusions:** SA and DP, leading to excess productivity losses among people with back pain, reflect the challenges these patients are facing to maintain their work capacity. Interventions to promote that individuals with back pain remain in paid work should be a priority in order to address the high costs.

**Gedin et al. 2020.**

**BMJ Open, vol. 10, no. 8.**

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**Keywords:** Back pain; health economics; pain management.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/10/8/e036638.long>

## Adapting to the Future of Work

### Technology

#### **Debating the future of work: The perception and reaction of the Spanish workforce to digitization and automation technologies**

Given the significant changes that are expected in the nature of work as a consequence of rapid technological advances, it is crucial that society finds ways to maximize benefits while recognizing and mitigating related challenges. This article is intended to fill a current research gap in this context by examining how aware and prepared affected workers are for the challenges predicted by research. This information is crucial since expectation and preparation of the workforce will significantly influence society's adaptability to the future. As a result of the article various significant relationships among workers' characteristics and their attitude towards automation could be identified. The interviewed workers' level of fear appears to have very little influence on preparation for automation-driven changes in the future while perceived opportunity significantly impacts this degree of preparation. Characteristics that additionally most influence the degree of preparatory steps taken by respondents are their level of education as well as work complexity and position. These findings should be used to identify potential ways for relevant stakeholders to adequately prepare for and meet the challenges of the impending increase of automation in the workplace.

**Rodriguez-Bustelo et al. 2020.**

**Frontiers in Psychology, vol. 11.**

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**Keywords:** Spanish workforce; complexity of the work; education for the future; fear to the digital work environment; preparation for the work automatization; structural equation models

**Evidence Level:** 6B

**Link:** <https://pubmed.ncbi.nlm.nih.gov/32849151/>

#### **Productive employment and decent work: The impact of AI adoption on psychological contracts, job engagement and employee trust**

This research examines the tension between the aims of the United Nations' Sustainable Development Goal 8 (SDG 8), to promote productive employment and decent work, and the adoption of Artificial Intelligence (AI). Our findings are based on the analysis of 232 survey results, where we tested the effects of AI adoption on workers' psychological contract, engagement and trust. We find that psychological contracts had a significant, positive effect on job engagement and on trust. Yet, with AI adoption, the positive effect of psychological contracts fell significantly. A further re-examination of the extant literature leads us to posit that AI adoption fosters the creation of a third type of psychological contract, which we term "Alienational". Whereas SDG 8 is premised on strengthening relational contracts between an organization and its employees, the adoption of AI has the opposite effect, detracting from the very nature of decent work.

**Braganza et al. 2020.**

## Journal of Business Research.

**Keywords:** Artificial intelligence; decent work; employee engagement; job trust; psychological contract; sustainable development goals.

**Evidence Level:** 5A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7434459/>

## Aging Workforce

### Inequalities in extending working lives beyond age 60 in Canada, Denmark, Sweden and England-By gender, level of education and health

**Background:** Keeping older workers in employment is critical for societies facing the challenge of an ageing population. This study examined the association between types of health conditions and differentials in the probability of employment by level of education among men and women between 60-69 years of age in Canada, Denmark, Sweden and England. **Methods:** Data were drawn from the Canadian Community Health Survey, Survey of Health, Ageing and Retirement in Europe and English Longitudinal Study of Ageing. We combined country data, applied logistic regression, adjusted for educational level, and stratified the analysis by sex to calculate the odds ratio (OR) of employment (>15 hours work per week) for persons with physical health conditions, mental health conditions (depression) and physical-mental health comorbidity.

**Results:** The odds of employment among men and women with physical-mental health comorbidity were lower compared to those with no/other conditions (men: OR 0.32, 95% CI: 0.25-0.42, women: OR 0.38 95% CI: 0.30-0.48). Women with low education had lower odds of employment compared to their counterparts with high education (OR 0.66, 95% CI: 0.57-0.76). The odds of employment at older ages was lower in Canada, Denmark and England compared with Sweden (e.g. English men: OR 0.48 95% CI 0.40-0.58; English women OR 0.33 95% CI 0.27-0.41). **Conclusions:** The odds of employment beyond age 60 is lower for groups with low education, particularly women, and those with physical-mental health co-morbidities. As such, policies to extend working lives should not be 'one size fits all' but instead consider subgroups, in particular, these groups that we have shown to be most vulnerable on the labour market.

**McAllister et al. 2020.**

**PLoS One, vol. 15, no. 8.**

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**Keywords:** Inequalities; working life's; age 60; gender; education; health.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0234900>

## Guiding and Supporting Mental Health and Wellbeing

### Mental Health

#### The negative impact of long working hours on mental health in young Korean workers

Long working hours are known to have a negative effect on health. However, there is no clear evidence for a direct link between mental health and long working hours in the young adult populations. Therefore, we aimed to determine whether long working hours are associated with mental health in young adult workers. Data were collected from a 2012 follow-up survey of the Youth Panel 2007. A total of 3,332 young adult employees (aged 20 to 35) were enrolled in the study. We analyzed stress, depression, and suicidal thoughts by multivariate logistic regression analysis based on working hours (41 to 50, 51 to 60 and over 60 hours, compared to 31 to 40 hours per week), which was adjusted for sex, age, marriage status, region, and educational level. From the 3,332 young adult employees, about 60% of the workers worked more than 40 hours and 17% of the workers worked more than 50 hours per week. In a Chi-square test, stress level, depression, and suicidal thoughts increased with increasing working hours (p-value <0.001, 0.007, and 0.018, respectively). The multivariate logistic regression model showed that, compared to the 31 to 40 hours per week group, the adjusted odds ratios of the 41 to 50, 51 to 60, and over 60 hours per week groups for stress were 1.46(1.23-1.74), 2.25(1.79-2.83) and 2.55(1.72-3.77), respectively. A similar trend was shown in depression [odds ratios: 2.08(1.23-3.53), 2.79(1.44-5.39) and 4.09(1.59-10.55), respectively]



and suicidal ideation [odds ratios: 1.98(0.95-4.10), 3.48(1.48-8.19) and 5.30(1.61-17.42), respectively]. We concluded that long working hours were associated with stress, depression, and suicidal ideation in young employees, aged 20 to 35.

**Park et al. 2020.**

**PLoS One, vol. 15, no. 8.**

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**Keywords:** Long working hours; mental health; young workers.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236931>

## Psychosocial Issues – Risk Factors

### **Authentic happiness at work: Self- and peer-rated orientations to happiness, work satisfaction, and stress coping**

The authentic happiness theory covers three basic orientations to happiness; namely, the life of pleasure (via hedonism); engagement (via flow-related experiences); and meaning (via eudaimonia). There is broad evidence for a positive relationship between these three orientations and indicators of positive psychological functioning in a variety of life domains. However, their contribution to well-being at work is understudied. The main aim of this study was testing the relationship between self- and peer-rated orientations to happiness, work related well-being (work satisfaction, work stress), and coping strategies. Further possible mediating effects of the coping strategies on the relationship between orientations to happiness and well-being at work were also examined. The sample consisted of 372 German-speaking Swiss adults (60.3% female), aged between 18 and 65 years ( $M = 38.9$ ,  $SD = 10.8$ ) with a minimum of 40% full-time employment. For 100 persons, peer-ratings of the orientations to happiness were available. Our results showed that the life of engagement and, to a lesser extent, the life of meaning are related to work satisfaction. The life of pleasure was associated with lower levels of reported work stress. Further, positive associations between self- and peer-rated orientations to happiness (particularly pleasure) and adaptive coping strategies with stress were also found. Mediation analyses showed that the effects of engagement in general and content-related work satisfaction were mediated mainly by control and negative coping, while the association between meaning and resigned work satisfaction was mediated by positive coping. Negative coping fully mediated the association between the pleasurable life and work stress. Overall, our results indicate that employees' orientations to happiness are of importance for experiencing well-being at work.

**Tandler et al. 2020.**

**Frontiers in Psychology, vol.11**

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**Keywords:** Coping; orientations to happiness; positive psychology; work satisfaction; work stress

**Evidence Level:** 4B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01931/full>

### **Factors related to subjective well-being in workers who interact with angry clients**

**Background:** Among workers who interact with angry clients, there is limited information about the characteristics of workers who are most vulnerable to mental health problems. Thus, we determined the association of multiple demographic, socioeconomic, and modifiable work-related psychosocial factors with the subjective well-being of workers who interact with angry clients. **Methods:** This was a secondary analysis of data from the fifth Korean Working Conditions Survey, conducted in 2017. The study focused on workers who interacted with angry clients during 25% or more of their work time. Multiple logistic regression was used to determine odds ratios (ORs) and 95% confidence intervals for the association of multiple factors with self-reported subjective well-being after adjustment for demographic, socioeconomic, and modifiable psychosocial factors. **Results:** Overall, 9.6% of men and 7.4% of women who interacted with angry clients reported poor subjective well-being. Poor well-being was significantly more likely to be reported by men who worked 40 hours or more per week (aOR, 3.97-5.37) and by men who were daily workers (aOR, 2.21). Poor subjective well-being had a significantly positive association with exposure to



adverse social behaviors by clients (men: aOR, 1.54, women: aOR, 1.58), and significantly negative associations with unskilled manual work (women only: aOR, 0.30), job satisfaction (men: aOR, 0.70, women: aOR, 0.52), and good social climate (men: aOR, 0.70, women: aOR, 0.44). **Conclusion:** Workers who interact with angry clients were widely distributed over non-manual labor and manual labor, but not limited to service and sales job. We identified modifiable factors that affect the subjective well-being of workers who interact with angry clients. We suggest that employers provide protection to prevent adverse social behaviors by clients, and also make an effort to establish a good social climate at the workplace.

**Park et al. 2020.**

**Journal of Korean Medical Science, vol. 35, no. 32.**

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**Keywords:** Adverse social behavior; client; job satisfaction; support; well-being.

**Evidence Level:** 4B

**Link:** <https://jkms.org/DOIx.php?id=10.3346/jkms.2020.35.e248>

### **Unravelling work drive: A comparison between workaholism and overcommitment**

Workaholism and overcommitment are often used as interchangeable constructs describing an individual's over-involvement toward their own job. Employees with high levels in both constructs are characterized by an excessive effort and attachment to their job, with the incapability to detach from it and negative consequences in terms of poor health and job burnout. However, few studies have simultaneously measured both constructs, and their relationships are still not clear. In this study, we try to disentangle workaholism and overcommitment by comparing them with theoretically related contextual and personal antecedents, as well as their health consequences. We conducted a nonprobability mixed mode research design on 133 employees from different organizations in Italy using both self- and other-reported measures. To test our hypothesis that workaholism and overcommitment are related yet different constructs, we used partial correlations and regression analyses. The results confirm that these two constructs are related to each other, but also outline that overcommitment (and not workaholism) is uniquely related to job burnout, so that overcommitment rather than workaholism could represent the true negative aspect of work drive. Additionally, workaholism is more related to conscientiousness than overcommitment, while overcommitment shows a stronger relationship with neuroticism than workaholism. The theoretical implications are discussed.

**Avanzi et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16.**

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**Keywords:** Burnout; other-report; overcommitment; personality; workaholism.

**Evidence Level:** 5B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5755>

### **The moderating effect of exposure to robbery on the relationship between post-traumatic stress and job satisfaction**

Research has disregarded the boundary conditions of the effects of post-traumatic stress symptoms (PTSS) at work. Addressing this issue, the present study examines the moderating impact of the (shared vs. isolated) exposure to robbery on the relationship between PTSS and employee job satisfaction. Drawing on the conservation of resources theory, we argue that PTSS would positively affect employee job satisfaction when the robbery is experienced collectively. To test our predictions, we conducted a two-wave study-with a lag of two months between measurements-on 140 employees from a national bank in Italy. Results from hierarchical regression analyses supported our prediction: the exposure to robbery moderated the relationship between PTSS and job satisfaction. While within the "isolated exposure" group the job satisfaction score was higher among less symptomatic victims, within the "shared exposure" group those with high PTSS reported higher job satisfaction levels than those with low PTSS. We discuss the implications of these findings for theory and practice.

**Montani et al. 2020.**

**Industrial Health, vol. 58, no. 4.**

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**Keywords:** Exposure to robbery; job satisfaction; post-traumatic stress.

**Evidence Level:** 4A

**Link:** [https://www.jstage.jst.go.jp/article/indhealth/58/4/58\\_2019-0096/article](https://www.jstage.jst.go.jp/article/indhealth/58/4/58_2019-0096/article)

### **The moderated-mediation effect of workplace anxiety and regulatory focus in the relationship between work-related identity discrepancy and employee innovation**

Extant research on work-related identity discrepancy mostly has probed its effects on employees' attitudes and emotions but has paid little attention to its impact on employee behaviors. Drawing on self-discrepancy theory, we examined the influencing mechanism and conditions of work-related identity discrepancy on employee innovation behavior. With data collected from 563 employees who personally experienced leadership transition in the workplace, we found that work-related identity discrepancy predicts employee innovation behavior through workplace anxiety. We also discovered that employees' personality traits—promotion regulatory focus and prevention regulatory focus in particular—can intensify or buffer the negative relationship between work-related identity discrepancy and employee innovation behavior. We further discuss the conceptual and practical implications of these findings.

**Liu et al. 2020.**

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

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**Keywords:** Employee innovation behavior; regulatory focus; work-related identity discrepancy; workplace anxiety.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/17/6121>

### **Association between overtime-working environment and psychological distress among Japanese workers: A multilevel analysis**

**Objective:** The study aims to examine the association between overtime-working environment (OWE) and individual psychological distress among Japanese workers. **Methods:** Data of 7786 workers from 101 companies in Japan were analyzed. Psychological distress was assessed through a 29-item questionnaire. The OWE was evaluated by calculating the proportion of workers whose monthly overtime was 45 hours or more in a workplace. Multilevel logistic regression was used. **Results:** As 10% increase in the OWE was associated with a 16% higher risk of individual psychological distress after adjustment of individual covariates, including overtime working hours. Cross-level interaction showed that the risk was varied depending on individual overtime working hours. **Conclusions:** OWE was associated with the psychological distress of workers. It is necessary to create a non-OWE at workplaces to prevent psychological distress for workers.

**Ishida et al. 2020.**

**Journal of Occupational and Environmental Medicine, vol. 62, no. 8.**

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**Keywords:** Overtime; working environment; OWE; psychological distress; Japanese workers.

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Fulltext/2020/08000/Association\\_Between\\_Overtime\\_Working\\_Environment.12.aspx](https://journals.lww.com/joem/Fulltext/2020/08000/Association_Between_Overtime_Working_Environment.12.aspx)

## **Burnout**

### **Investigating the relationship between work-to-family conflict, job burnout, job outcomes, and affective commitment in the construction industry**

This study explored the effects of work-to-family conflict on job burnout and job outcomes in the construction industry, focusing on the moderating effects of affective commitment. Based on the

conservation of resources theory, a theoretical model introducing affective commitment as a moderating variable was established. A structured questionnaire survey was then implemented among construction professionals in China. A total of 376 valid responses were obtained. Structural equation modeling was used to analyze the valid data. The results revealed the following: (i) work-to-family conflict has a significant positive impact on job burnout, but a significant negative impact on job satisfaction and job performance; (ii) job burnout negatively affects job satisfaction and job performance; (iii) affective commitment negatively moderates the effects of work-to-family conflict on job burnout. This study provides a reference for construction companies to manage work-to-family conflict and job burnout of employees, while also improving their affective commitment and job outcomes.

**Liu et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16**

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**Keywords:** Affective commitment; job burnout; job outcomes; work-to-family conflict.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5995>

### **Burnout syndrome in police officers and its relationship with physical and leisure activities**

No previous studies in Mexico have been found that jointly analyze physical and leisure activities as variables related to mental health in police officers. This paper presents research on burnout in Mexican Police officers. The question it answers is: is there any association of burnout with physical and leisure activities and personal profile? A total of 276 police officers (87% men and 13% women) participated. To obtain information, the Spanish Burnout Inventory and the Operational Police Stress questionnaires were used. A cross sectional study design was utilized with tests of validity and reliability, goodness of fit, analysis of variance (ANOVA), and analysis of k-means clusters. Results showed that a high number of policemen had high prevalence of burnout and a high level of mental exhaustion, and that exercise was positively and significantly related to lower burnout risk. Men showed higher risk than women. Results should be considered to improve interventions and occupational health practices in the police force. This paper improves understanding of burnout among policemen and the importance of exercise and leisure activities to alleviate burnout.

**García-Rivera et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 15.**

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**Keywords:** Burnout syndrome; fatigue; police; psychosocial risk factors; work-related exhaustion.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/15/5586>

### **Burnout, depression, career satisfaction, and work-life integration by physician race/ethnicity**

**Importance:** Previous research suggests that the prevalence of occupational burnout varies by demographic characteristics, such as sex and age, but the association between physician race/ethnicity and occupational burnout is less well understood. **Objective:** To investigate possible differences in occupational burnout, depressive symptoms, career satisfaction, and work-life integration by race/ethnicity in a sample of US physicians. **Design, setting, and participants:** In this cross-sectional study, data for this secondary analysis of 4424 physicians were originally collected from a cross-sectional survey of US physicians between October 12, 2017, and March 15, 2018. The dates of analysis were March 8, 2019, to May 21, 2020. Multivariable logistic regression, including statistical adjustment for physician demographic and clinical practice characteristics, was performed to examine the association between physician race/ethnicity and occupational burnout, depressive symptoms, career satisfaction, and work-life integration. **Exposures:** Physician demographic and clinical practice characteristics included race/ethnicity, sex, age, clinical specialty, hours worked per week, primary practice setting, and relationship status. **Main outcomes and measures:** Physicians with a high score on the emotional exhaustion or depersonalization subscale of the Maslach Burnout Inventory were classified as having burnout. Depressive symptoms were measured using the Primary Care Evaluation of Mental Disorders instrument. Physicians who marked "strongly agree" or "agree" in response to the survey items "I would choose to become a physician again" and "My work

schedule leaves me enough time for my personal/family life" were considered to be satisfied with their career and work-life integration, respectively. **Results:** Data were available for 4424 physicians (mean [SD] age, 52.46 [12.03] years; 61.5% [2722 of 4424] male). Most physicians (78.7% [3480 of 4424]) were non-Hispanic White. Non-Hispanic Asian, Hispanic/Latinx, and non-Hispanic Black physicians comprised 12.3% (542 of 4424), 6.3% (278 of 4424), and 2.8% (124 of 4424) of the sample, respectively. Burnout was observed in 44.7% (1540 of 3447) of non-Hispanic White physicians, 41.7% (225 of 540) of non-Hispanic Asian physicians, 38.5% (47 of 122) of non-Hispanic Black physicians, and 37.4% (104 of 278) of Hispanic/Latinx physicians. The adjusted odds of burnout were lower in non-Hispanic Asian physicians (odds ratio [OR], 0.77; 95% CI, 0.61-0.96), Hispanic/Latinx physicians (OR, 0.63; 95% CI, 0.47-0.86), and non-Hispanic Black physicians (OR, 0.49; 95% CI, 0.30-0.79) compared with non-Hispanic White physicians. Non-Hispanic Black physicians were more likely to report satisfaction with work-life integration compared with non-Hispanic White physicians (OR, 1.69; 95% CI, 1.05-2.73). No differences in depressive symptoms or career satisfaction were observed by race/ethnicity. **Conclusions and relevance:** Physicians in minority racial/ethnic groups were less likely to report burnout compared with non-Hispanic White physicians. Future research is necessary to confirm these results, investigate factors contributing to increased rates of burnout among non-Hispanic White physicians, and assess factors underlying the observed patterns in measures of physician wellness by race/ethnicity.

**Garcia et al. 2020.**

**JAMA Network Open, vol. 3, no. 8.**

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**Keywords:** Burnout; depression; career satisfaction; work-life integration; physician; race; ethnicity.

**Evidence Level:** 4A

**Link:** <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2769136>

## Enabling Healthy and Safe Workplaces

### Health and Wellbeing

#### Associations among working hours, sleep duration, self-rated health, and health-related quality of life in Korean men

**Background:** This study aimed to examine the relationship between working hours and health-related quality of life (HRQOL) in men and to determine whether this relationship was mediated by sleep duration and self-rated health (SRH). **Materials and methods:** Our study population included 2141 working men aged 20 to 49 years old from the Korea National Health and Nutrition Examination Survey 2016-2017. Working hours, SRH, and HRQOL were measured by a structured questionnaire survey. Sleep duration was calculated based on self-reported data. We investigated the association between working hours and HRQOL and performed a mediation analysis to evaluate the contributions of sleep duration and poor SRH to this relationship. **Results:** This study identified a significant association between working hours and HRQOL. Long working hours directly and indirectly affected HRQOL through poor SRH. Men who overworked were more likely to report poor HRQOL due to worsened SRH. Poor SRH was responsible for 26.3% of this relationship. But sleep duration did not explain the relationship between working hours and HRQOL. **Conclusions:** Working hours were directly associated with HRQOL in men. Furthermore, there was an indirect effect of working hours on HRQOL mediated by poorer SRH. An improved work-life balance is necessary to promote men's health and quality of life.

**Woo et al. 2020.**

**Health and Quality of Life Outcomes, vol. 18, no. 1.**

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**Keywords:** Health-related quality of life; men; self-rated health; sleep duration; working hours.

**Evidence Level:** 4B

**Link:** <https://hqlo.biomedcentral.com/articles/10.1186/s12955-020-01538-2>

### **The mediating effect of unhealthy behaviors and body mass index in the relation between high physical workload and self-rated poor health in male construction workers**

**Objectives:** To examine the mediating role of unhealthy behaviors and body mass index (BMI) in the relation between high physical workload and self-rated health in male construction workers. **Methods:** Longitudinal data over 2010 to 2018 were used of 30,224 male construction workers in The Netherlands. Smoking, lack of physical activity, and alcohol consumption were self-reported. BMI was based on measured body weight and height. Multilevel modeling path analyses were used to determine the mediating role of unhealthy behaviors in the relation between physical workload and poor health. **Results:** A direct effect of high physical workload on poor health adjusted for unhealthy behaviors and BMI was found (odds ratio [OR] 1.49, 95% confidence interval [CI] 1.38 to 1.68). Indirect effects of the unhealthy behaviors and BMI in the relation between high physical workload and poor health were small (OR varying from 0.96 to 1.04). **Conclusion:** The pathway of high physical workload and poor health through unhealthy behaviors and BMI was not supported.

**Proper et al. 2020.**

**Journal of Occupational and Environmental Medicine, vol. 62, no. 8.**

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**Keywords:** Body Mass Index, poor health, male, construction, behaviors, workload

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Fulltext/2020/08000/The\\_Mediating\\_Effect\\_of\\_Unhealthy\\_Behaviors\\_and\\_20.aspx](https://journals.lww.com/joem/Fulltext/2020/08000/The_Mediating_Effect_of_Unhealthy_Behaviors_and_20.aspx)

### **High physical work demands and working life expectancy in Denmark**

**Objective:** In most European countries, political reforms gradually increase the statutory retirement age to counter the economic costs of a growing elderly population. However, working to a high age may be difficult for people with hard physical labour. We aim to study the impact of high physical work demands on working life expectancy (WLE). **Methods:** We combined physical work demands assessed by job exposure matrix (JEM) and longitudinal high-quality national registers (outcome) in 1.6 million Danish workers to estimate WLE and years of sickness absence, unemployment and disability pension. The JEM value for physical work demand is a summarised score of eight ergonomic exposures for 317 occupations groups, sex and age. The WLE was estimated using a multistate proportional hazards model in a 4-year follow-up period. **Results:** Individuals with high physical work demands had a significantly lower WLE, than those with low physical work demands, with largest differences seen among women. At age 30 years, women with high physical work demands can expect 3.1 years less working, 11 months more of sickness absence and 16 months more of unemployment than low-exposed women. For 30-year-old men, the corresponding results were 2.0 years, 12 months and 8 months, respectively. **Conclusion:** Our findings show that high physical work demands are a marked risk factor for a shortened working life and increased years of sickness absence and unemployment. The results are important when selecting high-risk occupations and expand the knowledge base for informed political decision making concerning statutory retirement age.

**Pedersen et al. 2020.**

**Occupational and Environmental Medicine, vol. 77, no. 8.**

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**Keywords:** Physical work; work demands; working life expectancy.

**Evidence Level:** 4A

**Link:** <https://oem.bmj.com/content/77/8/576.long>

### **Analysis of wellbeing in nongovernmental organizations' workplace in a developed area context**

An extremely useful theoretical approach to understanding the nature of work, health, and wellbeing is the job demand-control (JDC) model and the job demand-control-support (JDCS) model. In order for professional workers in the nongovernmental organization (NGO) sector to do their job, it is necessary for them to have a feeling of wellbeing. Despite this, in Europe, studies regarding the effects of the JDCS model



in relation to workers' wellbeing have not been carried out. This study is expected to fill this important gap in research by analyzing the relationship of wellbeing with work demands, work control, and social support. In order to corroborate the proposed hypotheses, an analysis of these constructs in employees in European nongovernmental organizations (NGOs) was developed and, using structural equation models, these relationships were tested. The results confirm the main hypothesis of the job demand-control-support (JDCS) model and the causal relationship among physical and psychological demands, work control, and support from supervisors and colleagues with the level of employee wellbeing.

**Navajas-Romero et al. 2020.**

**International Journal of Environmental Research and Public Health**, vol. 17, no. 16

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**Keywords:** NGOs; job control; job demands; social support; wellbeing.

**Evidence Level:** 6B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5818>

### **Use of social media platforms for promoting healthy employee lifestyles and occupational health and safety prevention: A systematic review**

This systematic review assesses the feasibility and efficacy of social networking or enterprise social networking for promoting healthy lifestyles or for occupational health and safety (OHS) prevention. Literature searches were conducted in several indexed databases in order to retrieve studies whose main objective was the promotion of healthy lifestyles or the prevention of occupational injuries by means of social media or enterprise social networking alone or in combination with others promotional or preventive interventions. Ten studies were included. Results suggest that social media may be considered a possible means of communication for the promotion of healthy lifestyle habits in organizations, however further study into this technology has been recommended by several authors to judge the incremental impacts of social media on the promotion of healthy lifestyles. Similar conclusions were drawn from studies that included the use of a social media platform for OHS prevention. Based on current evidence, an organization's use of social media to promote a healthy lifestyle or OHS among its employees can constitute an innovative and promising means of intervention. It is important to mention that due to the scarcity and poor methodological quality of existing evidence, it is difficult at this time to draw firm conclusions regarding its effectiveness and relevance.

**Laroche et al. 2020.**

**Safety Science**, vol. 131.

**Keywords:** Enterprise social networking; healthy lifestyles; occupational health and safety; social media; social networking; workplace.

**Evidence Level:** 1A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7406239/>

### **Workplace social capital and refraining from seeking medical care in Japanese employees: A 1-year prospective cohort study**

**Objectives:** We examined the association of workplace social capital (WSC), including structural and cognitive dimensions, with refraining from seeking medical care (RSMC) among Japanese employees.

**Design:** One-year prospective cohort study. **Setting and participants:** We surveyed 8770 employees (6881 men and 1889 women) aged 18-70 years from 12 firms in Japan using a self-administered questionnaire comprising the WSC scale and the items on potential confounders (i.e., age, educational attainment and equivalent annual household income) at baseline (from April 2011 to March 2013). **Outcome measures:** At a 1-year follow-up, we measured RSMC using a single-item question 'In the past year, have you ever refrained from visiting a hospital, clinic, acupuncturist or dentist despite your sickness (including a slight cold or cavity) or injury?' **Results:** The results of Cox regression with robust variance showed that, after adjusting for potential confounders, the low WSC group (i.e., the lowest tertile group) had a significantly higher relative risk (RR) of RSMC compared with the high WSC group (i.e., the highest tertile group) among both men and women (overall WSC: RR 1.09 (95% CI 1.01 to 1.17) and 1.20 (95% CI 1.06 to 1.37); structural dimension: RR 1.13 (95% CI 1.04 to 1.22) and 1.25 (95% CI 1.07 to 1.45); and cognitive dimension: RR 1.11 (95% CI 1.03 to 1.20) and 1.21 (95% CI 1.06 to 1.38), respectively). Trend analysis using a continuous score



of the WSC scale also showed a significant association of low WSC with a higher risk of RSMC among both men and women. **Conclusions:** Our findings suggest that the lack of social capital in the workplace is associated with RSMC among Japanese employees.

**Inoue et al. 2020.**

**BMJ Open, vol. 10, no. 8.**

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**Keywords:** Epidemiology; occupational & industrial medicine; public health; social medicine.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/10/8/e036910.long>

## Work Health and Safety

### Mortality by occupation and industry among Japanese men in the 2015 fiscal year

**Background:** Although previous studies have underscored some unique inequalities in occupational mortality in Japan, many of these trends have been dramatically altered during recent decades. We analyzed mortality data by occupation and industry in Japan, to determine whether differences remained by the mid-2010s for men in working-age population. **Methods:** We calculated age-standardized all-cause and cause-specific mortality, according to occupation and industry, among men aged 25-64 years in the 2015 fiscal year (1 April 2015 to 31 March 2016). Occupational and industry-specific categories were defined using the Japan Standard Occupational Classification and Japan Standard Industrial Classification, respectively. Age-standardized mortality rates were computed using 5-year age intervals. Mortality rate ratios adjusted for age and 95% confidence intervals (CIs) were estimated using Poisson regression. Cause-specific deaths were classified into four broad groups (cancers [C00-D48], cardiovascular diseases [I00-I99], external causes [V01-Y98], and all other diseases) based on the International Statistical Classification of Diseases 10th Revision (ICD-10). **Results:** Clear mortality differences were identified by both occupation and industry among Japanese males. All-cause mortality ranged from 53.7 (clerical workers) to 240.3 (service workers) per 100,000 population for occupation and from 54.3 (workers in education) to 1169.4 (workers in mining) for industry. In relative terms, service workers and agriculture, forestry, and fishing workers had 2.89 and 2.50 times higher all-cause mortality than sales workers. Administrative and managerial workers displayed higher mortality risk (1.86; 95% CI 1.76-1.97) than sales workers. Similar patterns of broad cause-specific mortality inequality were identified in terms of both absolute and relative measures, and all broad cause-specific deaths contributed to the differences in mortality by occupation and industry. **Conclusions:** Substantial differences in mortality among Japanese male workers, according to occupation and industry, were still present in 2015.

**Tanaka et al. 2020.**

**Environmental Health and Preventative Medicine, vol. 25, no. 1.**

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**Keywords:** cause of death/trends; censuses; epidemiology; middle aged; registries; socioeconomic factors

**Evidence Level:** 4B

**Link:** <https://environhealthprevmed.biomedcentral.com/articles/10.1186/s12199-020-00876-3>

### Occupational accidents and injuries in construction industry in Jeddah city

In Saudi Arabia, the construction industry has been growing remarkably during the past several years. However, the most hazardous worksites in the country may be found in this industry. This study identified the causes of accidents and injuries in the construction industry among 300 workers in Jeddah City, situated on the coast of the Red Sea. Results from the questionnaire showed that the major cause of accidents and injuries is the lack of awareness about occupational safety and lack of experience among the workers (>82%); and the most common type of accidents and injuries that occur in the construction industry, are workers falling from a height (>80%), and electrical shock (>60%). Recommendations to prevent accidents and injuries in this industry are provided in this paper.

**Abukhashabah et al. 2020.**

**Saudi Journal of Biological Sciences, vol. 27, no. 8.**

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**Keywords:** Accidents; injuries; construction industry; occupational accidents; falling from a height; electric shock incidents; occupational injuries.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S1319562X20302734?via%3Dihub>

**Association between work-related hyperthermia emergency department visits and ambient heat in five southeastern states, 2010-2012- a case-crossover study**

The objective of this study is to assess ambient temperatures' and extreme heat events' contribution to work-related emergency department (ED) visits for hyperthermia in the southeastern United States to inform prevention. Through a collaborative network and established data framework, work-related ED hyperthermia visits in five participating southeastern U.S. states were analyzed using a time stratified case-crossover design. For exposure metrics, day- and location-specific measures of ambient temperatures and county-specific identification of extreme heat events were used. From 2010 to 2012, 5,017 work-related hyperthermia ED visits were seen; 2,298 (~46%) of these visits occurred on days when the daily maximum heat index was at temperatures the Occupational Safety and Health Administration designates as having "lower" or "moderate" heat risk. A 14% increase in risk of ED visit was seen for a 1°F increase in average daily mean temperature, modeled as linear predictor across all temperatures. A 54% increase in risk was seen for work-related hyperthermia ED visits during extreme heat events (two or more consecutive days of unusually high temperatures) when controlling for average daily mean temperature. Despite ambient heat being a well-known risk to workers' health, this study's findings indicate ambient heat contributed to work-related ED hyperthermia visits in these five states. Used alone, existing OSHA heat-risk levels for ambient temperatures did not appear to successfully communicate workers' risk for hyperthermia in this study. Findings should inform future heat-alert communications and policies, heat prevention efforts, and heat-illness prevention research for workers in the southeastern United States.

**Shire et al. 2020.**

**GeoHealth, vol. 4, no. 8.**

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**Keywords:** ambient temperature; case-crossover; extreme heat; heat stress disorders; primary prevention; workers

**Evidence Level:** 5A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7429406/>

**Associations of job-related hazards and personal factors with occupational injuries at continuous miner worksites in underground coal mines: A matched case-control study in Indian coal mine workers**

A wide range of job-related hazards and personal factors may be associated with injury occurrences at continuous miner worksites but their role has been little documented. To address this issue, a case-control study in India was conducted to compare 135 workers with an injury during the previous 2-yr period and 270 controls without injury during the previous 5-yr period (two controls for each injured worker, matched on age and occupation). Data were collected through face-to-face interviews using standardized questionnaire and analyzed using conditional logistic regression models. We found that the injury occurrences were multifactorial and associated with hand tool-related hazards (adjusted odds ratio/ORa=3.69,  $p<0.01$ ), working condition-related hazards (ORa=3.11,  $p<0.01$ ), continuous miner-related hazards (ORa=1.95,  $p<0.05$ ), and shuttle car-related hazards (ORa=6.95,  $p<0.001$ ), along with big family size, no-formal education, and presence of disease (adjusted odds ratios varying between 2 to 4). Stratified analyses showed that among the 36-60 yr-old workers, hand tool-related hazards, working condition-related hazards, and shuttle car-related hazards had significant ORa (6.62, 4.38 and 15.65, respectively with  $p<0.01$ ,) while among the younger workers, only shuttle car-related hazards had significant ORa (4.25,  $p<0.05$ ). These findings may help to understand the risk patterns of injuries and to implement appropriate prevention strategies.

**Senapati et al. 2020.**

**Industrial Health, vol. 58, no. 4.**

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**Keywords:** Continuous miner technology; matched case-control study; occupational injury; risk factors

**Evidence Level:** 5A

**Link:** [https://www.jstage.jst.go.jp/article/indhealth/58/4/58\\_2019-0102/article](https://www.jstage.jst.go.jp/article/indhealth/58/4/58_2019-0102/article)

## Risk Assessment

### **Quantification of exposure to risk postures in truck assembly operators: Neck, back, arms and wrists**

The study assessed the proportion of time in risky postures for the main joints of the upper limbs in a truck assembly plant and explored the association with musculoskeletal symptoms. Fourteen workstations (13 individuals) of a truck assembly plant were selected, and seven sensors were placed on the body segments of the participants. The sensors included tri-axial accelerometers for the arms and back, inclinometers for the neck and electro-goniometry for quantifying flexion/extension of the right and left hands. The proportions of time in moderate awkward postures were high at all workstations. Neck and wrist excessive awkward postures were observed for most workstations. The average values of the 91st percentile for back flexion and right/left arm elevation were 25°, 62°, and 57°, respectively. The 91st and 9th percentile averages for neck flexion/extension were 35.9° and -4.7°, respectively. An insignificant relationship was found between the percentage of time spent in awkward upper limb posture and musculoskeletal symptoms. The findings provide objective and quantitative data about time exposure, variability, and potential risk factors in the real workplace. Quantitative measurements in the field provide objective data of the body postures and movements of tasks that can be helpful in the musculoskeletal disorders (MSDs) prevention program.

**Zare et al. 2020.**

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

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**Keywords:** Automotive assembly plant; ergonomics; musculoskeletal disorders; quantitative measurement; risk evaluation.

**Evidence Level:** 5A

**Link:** <https://www.mdpi.com/1660-4601/17/17/6062>

## Chronic Health Issues

### **Adverse outcomes of chronic widespread pain and common mental disorders in individuals with sickness absence - A prospective study of Swedish twins**

**Background:** Chronic widespread pain (CWP) and common mental disorders (CMDs) are common public health problems, but little is known about the role of CWP and CMDs on future adverse outcomes among work disabled individuals. The aims of the study were to investigate the associations between CWP and CMDs with subsequent disability pension (DP), long-term unemployment (> 90 days) and all-cause mortality in individuals with sickness absence (SA) and whether the associations were explained by familial factors. **Methods:** In this prospective cohort study, 7884 Swedish twins born between 1933 and 1985 were included and baseline data were gathered from a questionnaire in 1998 to 2006. Register data were used for obtaining information regarding demographics, SA, DP, unemployment and mortality. Cox proportional hazards regressions were used to calculate Hazard Ratios (HR) with 95% Confidence Intervals (CI) for the associations between CWP and/or CMDs with DP, unemployment and mortality, while conditional Cox models for twin pairs provided control for familial confounding. **Results:** Having either CWP or CMDs among those with a history of SA was associated with a higher risk of DP and all-cause mortality than individuals without CWP and CMDs after controlling for socio-demographic and health factors. Moreover, sick-listed individuals with both CWP and CMDs had a higher risk of DP while those who only had CMDs had a higher risk of long-term unemployment compared to those without CWP and CMDs. The association between CMDs with DP and long-term unemployment was no longer significant when controlling for familial factors. **Conclusions:** CMDs was a risk factor for DP, unemployment and mortality among

individuals with SA, while CWP seems to be important in relation to future DP and mortality. Familial factors played a role in the associations between CMDs and DP and CMDs and unemployment.

**Wang et al. 2020.**

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

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**Keywords:** Chronic widespread pain; common mental disorders; disability pension; mortality; sick leave; twin study

**Evidence Level:** 4A

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09407-9>

### **Work ability, burnout complaints, and work engagement among employees with chronic diseases: Job resources as targets for intervention?**

**Purpose:** The aim of this study was to investigate the occupational well-being among employees with chronic diseases, and the buffering effect of four job resources, possibly offering targets to enhance occupational well-being. **Method:** This cross-sectional study (N = 1951) was carried out among employees in educational and (semi-) governmental organizations in the Netherlands. The dimensions of the survey were chronic diseases (i.e., physical, mental, or both physical and mental), occupational well-being (i.e., work ability, burnout complaints, and work engagement), and job resources (i.e., autonomy, social support by colleagues, supportive leadership style, and open and communicative culture). First, it was analyzed if chronic diseases were associated with occupational well-being. Second, it was analyzed if each of the four job resources would predict better occupational well-being. Third, possible moderation effects between the chronic disease groups and each job resource on occupational well-being were examined. Regression analyses were used, controlling for age. **Results:** Each chronic disease group was associated with a lower work ability. However, higher burnout complaints and a lower work engagement were only predicted by the group with mental chronic diseases and by the group with both physical and mental chronic disease(s). Furthermore, all four job resources predicted lower burnout complaints and higher work engagement, while higher work ability was only predicted by autonomy and a supportive leadership style. Some moderation effects were observed. Autonomy buffered the negative relationship between the chronic disease groups with mental conditions (with or without physical conditions) and work ability, and the positive relationship between the group with both physical and mental chronic disease(s) and burnout complaints. Furthermore, a supportive leadership style is of less benefit for occupational well-being among the employees with mental chronic diseases (with or without physical chronic diseases) compared to the group employees without chronic diseases. No buffering was demonstrated for social support of colleagues and an open and communicative organizational culture. **Conclusion:** Autonomy offers opportunities to reinforce occupational well-being among employees with mental chronic diseases. A supportive leadership style needs more investigation to clarify why this job resource is less beneficial for employees with mental chronic diseases than for the employees without chronic diseases.

**Boelhouwer et al. 2020.**

**Frontiers of Psychology, vol. 11, no. 1805.**

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**Keywords:** Burnout complaints; chronic diseases; job resources; multimorbidity; occupational well-being; work ability; work engagement.

**Evidence Level:** 4B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01805/full>

### **The influence of unhealthy behaviours on early exit from paid employment among workers with a chronic disease: A prospective study using the Lifelines cohort**

**Objectives:** This study examined the risk of unhealthy behaviours and the additive effects of multiple unhealthy behaviours on exit from paid employment among workers with a chronic disease and investigated effect modification by gender and educational level. **Methods:** Data from the Lifelines cohort, collected between 2006 and 2013, were enriched with registry data from Statistics Netherlands with up to 11 years follow-up. Workers with a chronic disease were selected (n = 11,467). The influence of unhealthy behaviours (physical inactivity, smoking, unhealthy diet, high alcohol intake, and obesity) on exit from paid

employment (unemployment, disability benefits, early retirement, and economic inactivity) was examined using competing risk models. To examine effect modification by gender and educational level, interaction terms were added. **Results:** Smoking and low fruit intake increased the risk to exit paid employment through unemployment and disability benefits. Low vegetable intake increased the risk of unemployment, obesity the risk of receiving disability benefits, and high alcohol intake the risk of early retirement. Physical inactivity was not associated with any exit from paid employment. Having multiple unhealthy behaviours increased the risk of both unemployment and of receiving disability. No consistent effect modification for gender or educational level was found. **Conclusions:** Unhealthy behaviours increased the risk to exit paid employment through unemployment and disability benefits among workers with a chronic disease, and this risk increased when having multiple unhealthy behaviours. Health promotion to support workers with chronic diseases to make healthier choices may help to extend their working life.

**Ots et al. 2020.**

**Preventative Medicine.**

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**Keywords:** Alcohol drinking; chronic disease; diet; employment; exercise; health behaviour; obesity; smoking; unemployment.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0091743520302528?via%3Dihub>

### **Individualised placement support as an employment intervention for individuals with chronic pain: A qualitative exploration of stakeholder views**

**Background:** Individualised Placement and Support (IPS) is a tailored, client-centred employment intervention for people with chronic health conditions. It involves the integration of vocational advisers within health teams to optimise return-to-work strategies. The intervention aims to get clients into employment by complementing traditional job searching skills with placements, and one-to-one mentoring alongside a work-focused health intervention. **Aim:** To explore the concept of IPS for individuals with chronic pain. **Design & setting:** A multi-method qualitative study was designed to explore stakeholder views of IPS for individuals with chronic pain in southern England. **Method:** Fourteen semi-structured interviews and three focus groups were conducted with current recipients of IPS (clients), employment support workers (ESWs), and healthcare professionals (HCPs). All data were audio-recorded, transcribed, and analysed using thematic analysis. **Results:** In total, 11 HCPs, five ESWs, and nine clients participated in the study. The analysis identified four themes. The situations of chronic pain patients were discussed, including their complex needs, multifaceted relationship with work, support from HCPs, and existing programmes that were failing to meet their needs. The intervention input was highlighted, including the recruitment procedures and role of ESWs. Programme activities and outcomes were also identified. **Conclusion:** This study identified the complex needs and relationship with work of individuals with chronic pain. It showed that ESWs need to understand the unpredictability of symptoms for individuals with chronic pain and that clients may need additional support before a placement. The findings highlighted several activities for future IPS interventions and potential outcomes for future evaluation.

**Holmes et al. 2020.**

**BJGP Open, vol. 4, no. 3.**

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**Keywords:** Chronic pain; employment; musculoskeletal pain; occupational health services; primary health care; rehabilitation; return to work.

**Evidence Level:** 5A

**Link:** <https://bjgpopen.org/content/4/3/bjgpopen20X101036.long>

## **Occupational Exposure**

### **Dermal and inhalable cobalt exposure-uptake of cobalt for workers at Swedish hard metal plants**

**Purpose:** Cobalt exposure is known to cause adverse effects on health. A major use of cobalt is in the manufacture of hard metal. Exposure can lead to asthma, hard metal lung disease, contact allergy and increased risk of cancer. Cobalt is mainly absorbed from the pulmonary tract, however penetration through



skin may occur. The relationships between exposure to inhalable cobalt in air and on skin and the uptake in blood and urine will be investigated, as well as the association between dermal symptoms and dermal exposure. **Methods:** Cobalt exposure in 71 workers in hard metal production facilities was measured as inhalable cobalt in the breathing zone and cobalt found on skin with acid wash. Uptake of cobalt was determined with concentrations in blood and urine. Correlations between exposure and uptake were analysed. **Results:** Inhalable cobalt in air and cobalt in blood and urine showed rank correlations with coefficients 0.40 and 0.25. Cobalt on skin and uptake in blood and urine presented correlation coefficients of 0.36 and 0.17. Multiple linear regression of cobalt in air and on skin with cobalt in blood showed regression coefficients with cobalt in blood ( $\beta = 203$   $p < 0.0010$ , and  $\beta = 0.010$ ,  $p = 0.0040$ ) and with cobalt in urine ( $\beta = 5779$ ,  $p = 0.0010$ , and  $\beta = 0.10$ ,  $p = 0.60$ ). **Conclusions:** Our data presents statistically significant correlations between exposure to cobalt in air with uptake of cobalt in blood and urine. Cobalt on skin was statistically significant with cobalt in blood but not with urine.

**Wahlqvist et al. 2020.**

**PLOS One, vol. 15, no. 8.**

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**Keywords:** Cobalt, dermal, blood, urine, metal

**Evidence Level:** 4A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0237100>

### **Retrospective exposure assessment methods used in occupational human health risk assessment: A systematic review**

As part of the assessment and management of chemical risk and occupational hygiene, retrospective exposure assessment (REA) to chemical agents can be defined as the estimate of exposure associated with a person's work history. The fundamental problem underlying the reconstruction of the exposure is that of transforming this type of information in quantitative terms to obtain an accurate estimate. REA can follow various approaches, some of which are technically complicated and both time and resource consuming. The aim of this systematic review is to present the techniques mainly used for occupational REA. In order to carry out this evaluation, a systematic review of the scientific literature was conducted. Forty-four studies were identified (published from 2010 to date) and analyzed. In exposure reconstruction studies, quantitative approaches should be preferable, especially when estimates will be used in the context of health impact assessment or epidemiology, although it is important to stress how, ideally, the experimental data available for the considered scenario should be used whenever possible as the main starting information base for further processing. To date, there is no single approach capable of providing an accurate estimate of exposure for each reasonably foreseeable condition and situation and the best approach generally depends on the level of information available for the specific case. The use of a combination of different reconstruction techniques can, therefore, represent a powerful tool for weighting and integrating data obtained through qualitative and quantitative approaches, in order to obtain the best possible estimate.

**Borghi et al. 2020.**

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

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**Keywords:** JEM; REA; asbestos; exposure assessment; job-exposure matrix; occupational exposure; past exposure; retrospective exposure assessment.

**Evidence Level:** 1A

**Link:** <https://www.mdpi.com/1660-4601/17/17/6190>

### **A quantitative meta-analysis of the relation between occupational benzene exposure and biomarkers of cytogenetic damage**

**Background:** The genotoxicity of benzene has been investigated in dozens of biomonitoring studies, mainly by studying (classical) chromosomal aberrations (CAs) or micronuclei (MN) as markers of DNA damage. Both have been shown to be predictive of future cancer risk in cohort studies and could, therefore, potentially be used for risk assessment of genotoxicity-mediated cancers. **Objectives:** We sought to estimate an exposure-response curve (ERC) and quantify between-study heterogeneity using all available



quantitative evidence on the cytogenetic effects of benzene exposure on CAs and MN respectively.

**Methods:** We carried out a systematic literature review and summarized all available data of sufficient quality using meta-analyses. We assessed the heterogeneity in slope estimates between studies and conducted additional sensitivity analyses to assess how various study characteristics impacted the estimated ERC. **Results:** Sixteen CA (1,356 individuals) and 13 MN 13MN studies (2,097 individuals) were found to be eligible for inclusion in a meta-analysis. Studies where benzene was the primary genotoxic exposure and that had adequate assessment of both exposure and outcomes were used for the primary analysis. Estimated slope estimates were an increase of 0.27% CA [(95% CI: 0.08%, 0.47%); based on the results from 4 studies] and 0.27% MN [(95% CI: -0.23%-0.23%, 0.76%); based on the results from 7 studies] per parts-per-million benzene exposure. We observed considerable between-study heterogeneity for both end points ( $I^2 > 90\%$ ). **Discussion:** Our study provides a systematic, transparent, and quantitative summary of the literature describing the strong association between benzene exposure and accepted markers of genotoxicity in humans. The derived consensus slope can be used as a best estimate of the quantitative relationship between real-life benzene exposure and genetic damage in future risk assessment. We also quantitate the large between-study heterogeneity that exists in this literature, a factor which is crucial for the interpretation of single-study or consensus slopes.

**Scholten et al. 2020.**

**Environmental Health Perspectives, vol. 128, no. 8.**

**User License:** [Open Access](#)

**Keywords:** Benzene, environmental exposures, biomarkers, genotoxicity

**Evidence Level:** 1A

**Link:** <https://ehp.niehs.nih.gov/doi/10.1289/EHP6404>

### **Strategic task and break timing to reduce ultraviolet radiation exposure in outdoor workers**

**Objectives:** Public health messaging about sun avoidance strategies is often not practical for outdoor workers. The objective of this study was to use personal monitoring data to determine when peak UVR exposure occurs for outdoor workers, estimate how much UVR could be reduced by altering the timing of shady tasks or breaks during peak exposure times, and descriptively compare these to peak periods of ambient UVR. Ultimately, we aim to provide evidence-based sun avoidance recommendations for outdoor workers in British Columbia, Canada. **Methods:** UVR exposure data [standard erythema dose (SED)] were collected during the 2013 summer months in Vancouver, using personal electronic dosimeters that sampled once per minute for an average of 4.4 working days (range: 1-7 days). Mixed-effect models were used to estimate the 60-, 30-, and 15-min time intervals at which maximum exposure occurred for the months of July and August. Using these time intervals, UVR exposure during peak periods was summarized as SED and as a percentage of the total daily exposure. Ambient UVR was also collected using data from the nearest Brewer spectrophotometer station and parallel analyses were conducted. **Results:** There were 73 workers and 321 participant-days available for analysis. Models indicated that periods of maximum exposure for 15-, 30-, and 60-min intervals began at 12:28, 12:17 pm, and 11:52 am, respectively, for sunny days in July. These periods were similar in August. The median exposure during these time periods and the potential for reducing UVR was 0.03 SED (2.8% potential daily exposure reduction), 0.09 SED (7.1%), and 0.18 SED (15.9%), respectively. However, there was a large range in exposure estimates as some workers experienced up to 84.8% of their exposure in the peak 60-min interval. **Conclusion:** Skin cancer prevention messaging does not include practical messages for outdoor workers and providing times of peak UVR help to identify times when the greatest reductions in exposure can occur. Prevention measures including shady breaks, increased sun protection, and task reorganization during these peak times are recommended during these peak times to reduce UVR exposure among those at highest risk.

**Peters et al. 2020.**

**Frontiers of Public Health.**

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**Keywords:** Exposure assessment (EA); occupational cancer; outdoor workers; solar UV; ultraviolet radiation (UV).

**Evidence Level:** 4A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00354/full>

### **Negative effect of methyl bromide fumigation work on the central nervous system**

Methyl bromide (MB) is a fumigant that has been widely used for killing pests on plants in trade, soils, and structures worldwide due to its excellent permeability and insecticidal effect; however, MB should be replaced because it is an ozone-depleting substance. It is well-known that MB is highly toxic and hazardous to workers, but the effects of exposure in asymptomatic workers have not been explored. The purpose of this study is to investigate the impact of MB fumigation on the health of fumigators at a sensitive level. The electroencephalogram (EEG) and urinary bromide ion levels of 44 fumigators (the study group) and 20 inspectors (the control) were measured before and after fumigation work from February to August 2019 in Busan, Korea. The mean post-work concentration of bromide ion (18.311 µg/mg CRE) in the fumigators was significantly increased from the pre-work level (7.390 µg/mg CRE) ( $P < 0.001$ ). The fumigator post-work median frequencies (MDF) and alpha-to-theta ratios (ATR) of EEG index were significantly decreased compared to the pre-work values ( $P < 0.05$  for all indices). In contrast, there were no significant differences in inspector EEG indices and urinary bromide ion. The urinary bromide ion levels in all the subjects were negatively correlated with MDF ( $P = 0.032$ ). In conclusion, fumigators' EEG indices and urinary bromide ion suggested that occupational exposure to MB negatively affected the health of workers, although the workers were asymptomatic.

**Park et al. 2020.**

**PLoS One, vol. 15, no. 8.**

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**Keywords:** Methyl bromide; MB; fumigant; pests; work; health; central nervous system.

**Evidence Level:** 5B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236694>

### **Occupational exposure to noise in relation to pregnancy-related hypertensive disorders and diabetes**

**Objectives:** Exposure to environmental noise has been associated with an increased risk of cardiovascular diseases and diabetes, but evidence for occupational noise is limited and conflicting, especially related to pregnancy outcomes. This study aimed to evaluate the association of occupational noise exposure with hypertensive disorders of pregnancy (HDP) and gestational diabetes. **Methods:** Our population-based cohort study utilized data on 1 109 516 singletons born to working mothers in Sweden between 1994-2014 from the Medical Birth Register and the Longitudinal Integration Database for Health Insurance and Labor Market Studies. Noise exposure came from a job exposure matrix (JEM) in five categories <70, 70-74, 75-80, 80-85, >85 dB(A). Relative risks (RR), adjusted for confounders and other job exposures, were calculated by modified Poisson regressions for the full sample and a subsample of first-time mothers reporting full-time work. **Results:** Exposure to 80-85 dB(A) of noise was associated with an increased risk of all HDP [RR 1.12, 95% confidence interval (CI) 1.05-1.18] and preeclampsia alone (RR 1.14, 95% CI 1.07-1.22) in the full sample. Results were similar for first-pregnancy, full-time workers. Exposure to >85 dB(A) of noise was also associated with an increased risk of gestational diabetes (RR 1.57, 95% CI 1.10-2.24) in the analysis restricted to first-time mothers working full-time. **Conclusion:** In this study, exposure to noise was associated with an increased risk for HDP and gestational diabetes, particularly in first-time mothers who work full-time. Further research is needed to confirm findings and identify the role of hearing protection on this association so prevention policies can be implemented.

**Lissaker et al. 2020.**

**Scandinavian Journal of Work and Environmental Health, vol. 12, no. 3913.**

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**Keywords:** Occupational exposure; noise; pregnancy-related; hypertensive disorders; diabetes.

**Evidence Level:** 4B

**Link:** [https://www.sjweh.fi/show\\_abstract.php?abstract\\_id=3913](https://www.sjweh.fi/show_abstract.php?abstract_id=3913)

### **Airborne occupational exposures and inflammatory biomarkers in the Lifelines cohort study**

**Introduction:** Inflammatory biomarkers are associated with negative health outcomes. In this study, we investigated the associations between airborne occupational exposures and levels and changes in inflammatory biomarkers. **Methods:** We included 79 604 adults at baseline from the Lifelines cohort of which 48 403 (60.8%) subjects were followed for a median of 4.5 years. Airborne occupational exposures at

the current or last-held job at baseline were estimated with the occupational asthma-specific job-exposure matrix. Both in cross-sectional and longitudinal analyses, we used linear regression models (adjusted for age, sex, education, monthly income, body mass index, smoking, pack-years, asthma and anti-inflammatory medication) to investigate the associations between airborne occupational exposures (allergens, reactive chemicals, pesticides and micro-organisms) and inflammatory biomarkers (C reactive protein (CRP), eosinophils and neutrophils). **Results:** In the cross-sectional analyses, exposure to allergens, reactive chemicals and micro-organisms was associated with a lower (Log) CRP level (B(95% CI)=-0.05 (-0.08 to -0.02), -0.05(-0.08 to -0.02) and -0.09(-0.16 to -0.02), respectively). Likewise, exposure to allergens, reactive chemicals, pesticides and micro-organisms was associated with a lower (log) neutrophils count (-0.01 (-0.02 to -0.01), -0.01 (-0.02 to -0.01), -0.02 (-0.04 to -0.01) and -0.02(-0.03 to -0.01), respectively). No association between airborne occupational exposures and eosinophils count was found. In the longitudinal analyses, no association between airborne occupational exposures and changes in inflammatory biomarkers was found. **Conclusions:** At baseline, airborne occupational exposures are inversely associated with inflammation; no effect of occupational exposures on inflammation was found at follow-up. In the future studies, details of occupational exposures, such as duration of exposures and cumulative exposures, need to be included to investigate the airborne occupational exposures and inflammatory biomarkers.

**Faruque et al. 2020.**

**Occupational and Environmental Medicine.**

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**Keywords:** Epidemiology; international occupational health; occupational health practice.

**Evidence Level:** 4A

**Link:** <https://oem.bmj.com/content/early/2020/08/07/oemed-2020-106493>

#### **Parental occupational exposure to pesticides and risk of childhood cancer in Switzerland: A census-based cohort study**

**Background:** Pesticide exposure is a suspected risk factor for childhood cancer. We investigated the risk of developing childhood cancer in relation to parental occupational exposure to pesticides in Switzerland for the period 1990-2015. **Methods:** From a nationwide census-based cohort study in Switzerland, we included children aged < 16 years at national censuses of 1990 and 2000 and followed them until 2015. We extracted parental occupations reported at the census closest to the birth year of the child and estimated exposure to pesticides using a job exposure matrix. Cox proportional hazards models, adjusted for potential confounders, were fitted for the following outcomes: any cancer, leukaemia, central nervous system tumours (CNST), lymphoma, non-CNS solid tumours. **Results:** Analyses of maternal (paternal) exposure were based on approximately 15.9 (15.1) million-person years at risk and included 1891 (1808) cases of cancer, of which 532 (503) were leukaemia, 348 (337) lymphomas, 423 (399) CNST, and 588 (569) non-CNS solid tumours. The prevalence of high likelihood of exposure was 2.9% for mothers and 6.7% for fathers. No evidence of an association was found with maternal or paternal exposure for any of the outcomes, except for "non-CNS solid tumours" (High versus None; Father: adjusted HR [95%CI] =1.84 [1.31-2.58]; Mother: 1.79 [1.13-2.84]). No evidence of an association was found for main subtypes of leukaemia and lymphoma. A post-hoc analysis on frequent subtypes of "non-CNS solid tumours" showed positive associations with wide CIs for some cancers. **Conclusion:** Our study suggests an increased risk for solid tumours other than in the CNS among children whose parents were occupationally exposed to pesticides; however, the small numbers of cases limited a closer investigation of cancer subtypes. Better exposure assessment and pooled studies are needed to further explore a possible link between specific childhood cancers types and parental occupational exposure to pesticides.

**Coste et al. 2020.**

**BMC Cancer, vol. 20, no. 1.**

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**Keywords:** Childhood cancer; occupation; pesticides; record-based cohort.

**Evidence Level:** 4B

**Link:** <https://bmccancer.biomedcentral.com/articles/10.1186/s12885-020-07319-w>

## Physical Activity

### Opposite effects of work-related physical activity and leisure-time physical activity on the risk of diabetes in Korean adults

The object of this study was to examine the effects of domestic and work-related physical activity (DWPA) and leisure-time physical activity (LTPA) on the risk of diabetes, by categorizing fasting blood glucose (FBG) levels into normal, Impaired Fasting Glucose (IFG), and diabetes. The sample consisted of 4661 adults aged 30 years or above, and was chosen from the 2017 Korean National Health and Nutrition Examination Survey (KNHANES) data. Of all the subjects, 14.6% engaged in high-intensity DWPA and 6.25% in moderate-intensity DWPA; while 11.68% and 24.80% engaged in high- and moderate-intensity LTPA, respectively. The effects of both types of physical activities on the risk of diabetes were analyzed using a Bayesian ordered probit model. For those with high-intensity DWPA, the probability of the FBG level being normal was 5.10% (SE = 0.25) lower than for those with non-high-intensity DWPA, and the probabilities of IFG and diabetes were 3.30% (SE = 0.15) and 1.79% (SE = 0.09) higher, respectively. However, for those with high-intensity LTPA, the probability of the FBG level being normal was 2.54% (SE = 0.09) higher, and the probabilities of IFG and diabetes were 1.74% (SE = 0.07) and 0.80% (SE = 0.03) lower, respectively, than those with non-high-intensity LTPA. Likewise, for moderate-intensity DWPA and LTPA, the results were the same compared to low-intensity physical activities though the magnitude of the effects were smaller than for high-intensity. Thus, the activities related to work have a negative effect and those related to leisure have a positive effect. The criteria for physical activities to reduce the risk of diabetes should be set by separating these domains of physical activity, and new management strategies for diabetes are needed for people with moderate- or high-intensity DWPA.

**Sook Oh et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16**

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**Keywords:** Bayesian ordered probit model; diabetes; domestic and work-related physical activity; fasting blood glucose (FBG); impaired fasting glucose (IFG); leisure-time physical activity.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5812>

## Musculoskeletal Health

### Effectiveness of a multidisciplinary biopsychosocial intervention for non-specific subacute low back pain in a working population: A cluster randomized clinical trial

**Background:** Low back pain (LBP) is a multifactorial condition with individual and societal impact that affects populations globally. Current guidelines for the treatment of LBP recommend pharmacological and non-pharmacological strategies. The aim of this study was to compare usual clinical practice with the effectiveness of a biopsychosocial multidisciplinary intervention in reducing disability, severity of pain and improving quality of life in a working population of patients with subacute (2-12 weeks), non-specific LBP.

**Methods:** Longitudinal cluster randomized clinical trial conducted in 39 Primary Health Care Centres (PHCC) of Barcelona, with patients aged 18-65 years (n = 501; control group = 239; 26 PHCC, intervention group = 262; 13 PHCC). The control group received usual clinical care. The intervention group received usual clinical care plus a biopsychosocial multidisciplinary intervention, which consisted of physiotherapy, cognitive-behavioural therapy and medication. The main outcomes were changes in the Roland Morris Disability Questionnaire (RMDQ), and the minimal clinically important differences. Secondary outcomes were changes in the McGill Pain (MGPPQ) and Quality of Life (SF-12) questionnaires. Assessment was conducted at baseline, 3 and 12 months. Analysis was by intention-to-treat and analyst-blinded. Multiple imputations were used. **Results:** Of the 501 enrolled patients, 421 (84%) provided data at 3 months, and 387 (77.2%) at 12 months. Mean age was 46.8 years (SD: 11.5) and 64.7% were women. In the adjusted analysis of the RMDQ outcome, only the intervention group showed significant changes at 3 months (- 1.33 points, p = 0.005) and at 12 months (- 1.11 points, p = 0.027), but minimal clinically important difference were detected in both groups. In the adjusted analysis of the RMDQ outcome, the intervention group improvement more than the control group at 3 months (- 1.33 points, p = 0.005) and at 12 months (- 1.11

points,  $p = 0.027$ ). The intervention group presented a significant difference. Both groups presented a minimal clinically important difference, but more difference in the intervention group. The intervention group presented significant differences in the MGPQ scales of current pain intensity and VAS scores at 3 months. No statistically significant differences were found in the physical and mental domains of the SF-12. **Conclusions:** A multidisciplinary biopsychosocial intervention in a working population with non-specific subacute LBP has a small positive impact on disability, and on the level of pain, mainly at short-term, but no difference on quality of life.

**Mas et al. 2020.**

**BMC Health Services Research, vol. 19, no. 1.**

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**Keywords:** Cognitive-behavioural therapy; disability; multidisciplinary biopsychosocial intervention; non-specific subacute low back pain; pain; primary health care; quality of life.

**Evidence Level:** 2B

**Link:** <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4810-x>

### **Influence of psychosocial and sociodemographic variables on sickness leave and disability in patients with work-related neck and low back pain**

The purpose of this study was to describe the association between psychosocial factors in patients with work-related neck or low back pain ( $n = 129$ ), in order to study sickness leave, its duration, the disability reported, and to analyze the relationship of these factors with different sociodemographic variables. This was a descriptive cross-sectional study. Data on kinesiophobia, catastrophizing, disability, and pain were gathered. Sociodemographic variables analyzed included sex, age, occupational, and educational level. Other data such as location of pain, sick leave status and duration of sickness absence were also collected. Educational level ( $p = 0.001$ ), occupational level ( $p < 0.001$ ), and kinesiophobia ( $p < 0.001$ ) were found to be associated with sickness leave; kinesiophobia ( $b = 1.47$ ,  $p = 0.002$ ,  $r = 0.35$ ) and catastrophizing ( $b = 0.72$ ,  $p = 0.012$ ,  $r = 0.28$ ) were associated with the duration of sickness leave. Educational level ( $p = 0.021$ ), kinesiophobia ( $b = 1.69$ ,  $p < 0.000$ ,  $r = 0.505$ ), catastrophizing ( $b = 0.76$ ,  $p < 0.000$ ,  $r = 0.372$ ), and intensity of pain ( $b = 4.36$ ,  $p < 0.000$ ,  $r = 0.334$ ) were associated with the degree of disability. In the context of occupational insurance providers, educational and occupational factors, as well as kinesiophobia and catastrophizing, may have an influence on sickness leave, its duration and the degree of disability reported.

**Macías-Toranzo et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16**

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**Keywords:** Catastrophizing; kinesiophobia; low back pain; musculoskeletal disorders; neck pain; psychosocial pain; sickness leave.

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/1660-4601/17/16/5966>

## **COVID-19**

### **Comparison of COVID-19 health risks with other viral occupational hazards**

The European Commission periodically classifies viruses on their occupational hazards to define the level of protection that workers are entitled to claim. Viruses belonging to Groups 3 and 4 can cause severe human disease and hazard to workers, as well as a spreading risk to the community. However, there is no effective prophylaxis or treatment available for Group 4 viruses. European trade unions and the Commission are negotiating the classification of the COVID-19 virus along these 2 categories. This article weighs the reasons to classify it in Group 3 or 4 while comparing its risks to those of the most significant viruses classified in these 2 categories. COVID-19 characteristics justify its classification in Group 4. Contaminated workers in contact with the public play an important role in disseminating the virus. In hospitals and nursing homes, they increase the overall case fatality rate. By strongly protecting these workers and professionals, the European Union would not only improve health in work environments, but also activate a mechanism key to reducing the COVID-19 burden in the general population. Admittedly, the availability of a new vaccine or treatment would change this conclusion, which was reached in the middle of the first pandemic.



**Unger et al. 2020.**

**International Journal of Health Services.**

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**Keywords:** COVID-19; burden of disease; epidemiology; occupational health

**Evidence Level:** 6B

**Link:** <https://journals.sagepub.com/doi/full/10.1177/0020731420946590>

### **Data on work-related consequences of COVID-19 pandemic for employees across Europe**

The COVID-19 pandemic influenced the work of employees across all continents. This article presents raw data that may be used to describe how the pandemic affected the work of employees in four European countries and how it influenced their job attitudes, feelings and work performance. In total, 726 respondents from Germany, the Czech Republic, Slovakia and Italy filled out an extensive online survey and provided information about changes in their workload, work difficulty, income, social contact, work from home, task performance and organizational commitment during the pandemic, and about the risk of being infected by COVID-19 during their workday. The employees also reported their actual work performance, organizational commitment, job satisfaction, intention to leave and irritation in the time of the pandemic. To reveal factors that might help employees cope with pandemic, the respondents filled out established questionnaires measuring servant leadership of their supervisor, perceived organizational support, social support provided by colleagues, their own occupational self-efficacy, resilience, job crafting and readiness for change. The data is unique as it was collected in a specific situation during the pandemic, when the work of employees was affected by security measures and lockdown introduced by governments in countries where they worked.

**Prochazka et al. 2020.**

**Data in Brief, vol. 32**

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**Keywords:** COVID-19; coping; job attitudes; lockdown; resilience; work performance.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S2352340920310684?via%3Dihub>

### **The quality of life, psychological health, and occupational calling of Korean workers: Differences by the new classes of occupation emerging amid the COVID-19 pandemic**

This study aimed to create new classifications for occupations that have emerged from the COVID-19 pandemic in Korea, based on Reich's classifications for the United States. We examined Korean workers' occupational calling, psychological health, and quality of life. An online questionnaire was administered and data from 1029 Korean workers were analyzed. The questionnaire comprised the Korean version of the Multidimensional Calling Measure to assess occupational calling, the Psychosocial Well-being Index-short form for psychological health, and the Control, Autonomy, Self-realization, and Pleasure (CASP-19) scale for quality of life. We created a Korean-adapted version of the classes of occupation based on those created by the COVID-19 situation in the USA. Our results showed that Korean workers had a high perceived calling to work, and different classes showed different levels of quality of life and psychological health. We need a health concentration management system for essential groups or personal safety protection equipment should be provided. Education on infection control should be offered and effective medical system processes should be in place. We need to develop technology to respond to medical needs online, remotely, or telephonically. The government should implement policies to ensure job security and to improve wages and welfare.

**Kim et al. 2020.**

**International Journal of Environmental Research and Public Health, vol. 17, no. 16.**

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**Keywords:** CASP-19; COVID-19; COVID-19 new classes of occupation; occupational calling; psychological health; quality of life; work environment.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/17/16/5689>



### **New technology, work and employment in the era of COVID-19: Reflecting on legacies of research**

The outbreak of COVID-19 is having a drastic impact on work and employment. This review piece outlines the relevance of existing research into new technology, work and employment in the era of COVID-19. It is important to be retrospective and undertake both a historically and theoretically informed position on the impact of new technologies in the current crisis and beyond. Issues of control, surveillance and resistance have been central to work on the impact of technology on work and employment and these themes have been identified as central to the experience of work in the current crisis.

**Hodder et al. 2020.**

#### **New Technology, Work and Employment.**

**Keywords:** COVID-19; control; crisis; employment; new technology; resistance; surveillance; work.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7436671/>

### **Work-related and personal factors associated with mental well-being during the COVID-19 response:**

#### **Survey of health care and other workers**

**Background:** The response to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has created an unprecedented disruption in work conditions. This study describes the mental health and well-being of workers both with and without clinical exposure to patients with coronavirus disease (COVID-19). **Objective:** The aim of this study is to measure the prevalence of stress, anxiety, depression, work exhaustion, burnout, and decreased well-being among faculty and staff at a university and academic medical center during the SARS-CoV-2 pandemic and describe work-related and personal factors associated with their mental health and well-being. **Methods:** All faculty, staff, and postdoctoral fellows of a university, including its medical school, were invited in April 2020 to complete an online questionnaire measuring stress, anxiety, depression, work exhaustion, burnout, and decreased well-being. We examined associations between these outcomes and factors including work in high-risk clinical settings and family/home stressors. **Results:** There were 5550 respondents (overall response rate of 34.3%). Overall, 34% of faculty and 14% of staff (n=915) were providing clinical care, while 61% of faculty and 77% of staff were working from home. Among all workers, anxiety (prevalence ratio 1.37, 95% CI 1.09-1.73), depression (prevalence ratio 1.28, 95% CI 1.03-1.59), and high work exhaustion (prevalence ratio 1.24, 95% CI 1.13-1.36) were independently associated with community or clinical exposure to COVID-19. Poor family-supportive behaviors by supervisors were also associated with these outcomes (prevalence ratio 1.40, 95% CI 1.21-1.62; prevalence ratio 1.69, 95% CI 1.48-1.92; and prevalence ratio 1.54, 95% CI 1.44-1.64, respectively). Age <40 years and a greater number of family/home stressors were also associated with these poorer outcomes. Among the subset of clinicians, caring for patients with COVID-19 and working in high-risk clinical settings were additional risk factors. **Conclusions:** Our findings suggest that the pandemic has had negative effects on the mental health and well-being of both clinical and nonclinical employees. Mitigating exposure to COVID-19 and increasing supervisor support are modifiable risk factors that may protect mental health and well-being for all workers.

**Evanoff et al. 2020.**

**Journal of Medical Internet Research, vol. 22, no. 8.**

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**Keywords:** COVID-19; coronavirus; health care workers; mental health; occupational health; pandemic; remote work; worker well-being.

**Evidence Level:** 5A

**Link:** <https://www.jmir.org/2020/8/e21366/>