



# Emerging Evidence Alert August 2019

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 presents a review of recent journal articles or relevant content related to the five Comcare themes of: enabling healthy and safe workplaces; enhancing employer capability; guiding and supporting mental health; fostering work participation; and the future of work. Articles are collated articles published in July/August 2019 only.

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**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



## The Collaborative Partnership to improve work participation – the story so far

The Collaborative Partnership was established by Comcare in 2017 to bring key organisations and sectors together to improve work participation and support systems for Australians with a temporary or permanent physical or mental health injury, illness or disability. Two years on and [four projects later](#), The Collaborative Partnership has made some significant progress. Here are two major highlights:

- Delivered the first conceptual map of Australia’s major benefit and compensation systems. This helped to quantify the cost and understand the movement of people between systems.  
(Cross Sector Systems Project led by the Department of Social Services and published by Monash University)
- Surveyed almost 2,500 Australian employers on recruiting, supporting and accommodating people with a health condition or disability.  
(Employer Mobilisation Project led by the Department of Employment, Skills, Small and Family Business)

These achievements have led to intervention trials and initiatives to improve services and build capability to facilitate better health and work outcomes. Find out more about [our partners](#) and how your organisation can [get involved](#).

## Fostering Work Participation

### *Presenteeism & absenteeism*

#### **Association between alcohol consumption and impaired work performance (presenteeism): A systematic review.**

**Objectives:** The aim of this review was to explore the notion of alcohol-related presenteeism; that is, whether evidence in the research literature supports an association between employee alcohol consumption and impaired work performance. **Design:** Systematic review of observational studies. **Data sources:** MEDLINE, Web of Science, PsycINFO, CINAHL, AMED, Embase and Swemed+ were searched through October 2018. Reference lists in included studies were hand searched for potential relevant studies. **Eligibility Criteria:** We included observational studies, published 1990 or later as full-text empirical articles in peer-reviewed journals in English or a Scandinavian language, containing one or more statistical tests regarding a relationship between a measure of alcohol consumption and a measure of work performance. **Data extraction and synthesis:** Two independent reviewers extracted data. Tested associations between alcohol consumption and work performance within the included studies were quality assessed and analysed with frequency tables, cross-tabulations and  $\chi^2$  tests of independence. **Results:** Twenty-six studies were included, containing 132 tested associations. The vast majority of associations (77%) indicated that higher levels of alcohol consumption were associated with higher levels of impaired work performance, and these positive associations were considerably more likely than negative associations to be statistically significant (OR=14.00, phi=0.37, p<0.001). Alcohol exposure measured by hangover episodes and composite instruments were over-represented among significant positive associations of moderate and high quality (15 of 17 associations). Overall, 61% of the associations were characterised by low quality. **Conclusions:** Evidence does provide some support for the notion of alcohol-related presenteeism. However, due to low research quality and lack of longitudinal designs, evidence should be characterised as somewhat inconclusive. More robust and less heterogeneous research is warranted. This review, however, does provide support for targeting alcohol consumption within the frame of workplace interventions aimed at improving employee health and productivity.

**Thorrisen et al. 2019.**

**BMJ Open, vol. 9, no. 8.**

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**Keywords:** Alcohol consumption; Employees; Presenteeism; Sick leave; Work performance; Workplace health promotion; Workplace interventions

**Evidence Level:** 1A

**Link:** <http://bmjopen.bmj.com/cgi/pmidlookup?view=long&pmid=31315869>

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

**Background:** Using a one-year prospective design, we examined the association of job dissatisfaction with long-term sickness absence lasting one month or more, before and after adjusting for psychosocial work environment (i.e., quantitative job overload, job control, and workplace social support) in Japanese employees. **Method:** We surveyed 14,687 employees (7,343 men and 7,344 women) aged 20-66 years, who had not taken long-term sickness absence in the past three years, from a financial service company in Japan. The Brief Job Stress Questionnaire, including scales on job satisfaction and psychosocial work environment, was administered, and information on demographic and occupational characteristics (i.e., age, gender, length of service, job type, and employment position) was obtained from the personnel records of the surveyed company at baseline (July-August 2015). Subsequently, information on the start dates of long-term sickness absences was obtained during the follow-up period (until July 2016) from the

personnel records. Cox's proportional hazard regression analysis was conducted. Results: After adjusting for demographic and occupational characteristics, those who perceived job dissatisfaction had a significantly higher hazard ratio of long-term sickness absence than those who perceived job satisfaction (hazard ratio=2.91; 95% confidence interval, 1.74-4.87). After additionally adjusting for psychosocial work environment, this association was weakened and no longer significant (hazard ratio=1.55; 95% confidence interval, 0.86-2.80). Conclusions: Our findings suggest that the association of job dissatisfaction with long-term sickness absence is spurious and explained mainly by psychosocial work environment

**Inoue et al. 2019.**

**Journal of Epidemiology.**

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**Keywords:** Absenteeism; Job satisfaction; Longitudinal studies; Psychosocial Job Characteristics; Survival Analysis

**Evidence Level:** 4B

**Link:** [https://www.istage.ist.go.jp/article/jea/advpub/0/advpub\\_JE20190050/article](https://www.istage.ist.go.jp/article/jea/advpub/0/advpub_JE20190050/article)

### **Trajectories of sickness absence among salaried workers: Evidence from the WORKss cohort in Catalonia (Spain), 2012-2014.**

**Objectives:** Sickness absence (SA) is a widely studied integrated measure of health status. To better understand how SA behaves over time (SA trajectory) a longitudinal and individual-centred approach will allow identifying groups of individuals who share common characteristics. The aim of this study was to identify and describe SA trajectories and to assess employment conditions and diagnosis groups as determinants. **Setting:** Working-life and sickness absence administrative records from a representative sample of affiliated with the Spanish Social Security system. **Participants:** 38 420 workers affiliated with the Spanish Social Security system, born 1949 to 1969 or 1970 to 1990, resident in Catalonia who had SA between 2012 and 2014 (75 212 episodes). **Results:** We identified three different SA trajectories in both birth cohorts for men and women: low-stable (86.2% to 90.8% of individuals), decreasing (4.4% to 5.9% of individuals) and increasing (4.1% to 8.7% of individuals) accumulated days of SA. The main characteristic of SA trajectories was the medical diagnosis group. The increasing SA trajectory had a higher proportion of workers with SA due to mental disorders compared with the other trajectories. The association analysis showed diagnosis group strongly related with all SA trajectories, particularly SA due to mental disorders showed the strongest association with the increasing trajectory among young men (adjusted OR (aOR): 42.40, 95% CI 17.03 to 105.57). Low salary levels exhibited a strong relationship with decreased accumulation of SA days over time for old women (aOR: 2.08, 95% CI 1.36 to 3.18) and men (aOR: 2.75, 95% CI 1.77 to 4.27). Unskilled manual occupations were associated with increasing trajectories among young women (aOR: 1.36, 95% CI 1.01 to 1.84). No significant differences were observed for other employment conditions across trajectories. **Conclusions:** Workers with mental disorders are more likely to have increased days of SA, whereas low salary levels at later ages are related to a decrease in SA days over time. Special attention to preventing the course of mental disorders at young and middle age is warranted.

**Ubalde-Lopez et al. 2019.**

**BMJ Open, vol. 9, no. 7.**

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**Keywords:** Disability; Occupational health; Sickness absence; Social and life-course epidemiology

**Evidence Level:** 4B

**Link:** <http://bmjopen.bmj.com/cgi/pmidlookup?view=long&pmid=31272980>

## **Health-related workplace absenteeism among full-time workers - United States, 2017-18 influenza season.**

During an influenza pandemic and during seasonal epidemics, more persons have symptomatic illness without seeking medical care than seek treatment at doctor's offices, clinics, and hospitals. Consequently, surveillance based on mortality, health care encounters, and laboratory data does not reflect the full extent of influenza morbidity. CDC uses a mathematical model to estimate the total number of influenza illnesses in the United States. In addition, syndromic methods for monitoring illness outside health care settings, such as tracking absenteeism trends in schools and workplaces, are important adjuncts to conventional disease reporting. Every month, CDC's National Institute for Occupational Safety and Health (NIOSH) monitors the prevalence of health-related workplace absenteeism among full-time workers in the United States using data from the Current Population Survey (CPS). This report describes the results of workplace absenteeism surveillance analyses conducted during the high-severity 2017-18 influenza season (October 2017-September 2018). Absenteeism increased sharply in November, peaked in January and, at its peak, was significantly higher than the average during the previous five seasons. Persons especially affected included male workers, workers aged 45-64 years, workers living in U.S. Department of Health and Human Services (HHS) Region 6 and Region 9, and those working in management, business, and financial; installation, maintenance, and repair; and production and related occupations. Public health authorities and employers might consider results from relevant absenteeism surveillance analyses when developing prevention messages and in pandemic preparedness planning. The most effective ways to prevent influenza transmission in the workplace include vaccination and nonpharmaceutical interventions, such as staying home when sick, covering coughs and sneezes, washing hands frequently, and routinely cleaning frequently touched surfaces.

**Groenewold et al. 2019.**

**MMWR Morbidity & Mortal Weekly Report, vol. 69, no. 26.**

**Keywords:** Absenteeism, Workplace, Influenza, Full time workers

**Evidence Level:** 5B

**Link:** <https://dx.doi.org/10.15585/mmwr.mm6826a1>

### *Return to work*

#### **Trajectories of sickness absence after road traffic injury: a Swedish register-based cohort study.**

**Objectives:** Despite much focus on the health impact of road traffic injury (RTI) on life, there is a lack of knowledge of the dynamic process of return to work following RTI and its related factors. The aim of this study was to identify longitudinal patterns of sickness absence (SA) following RTI, to examine the patterns' interplay with health-related quality of life (HRQoL) and to determine if there are differences, regarding the patterns and interplay, according to injury severity. **Design:** A register-based prospective cohort study. **Setting:** Administrative data on RTI in Sweden from the Swedish Traffic Accident Data Acquisition System (STRADA) and Swedish Social Insurance data. **Participants:** Individuals suffering an RTI (total n=4761) were identified in STRADA between 1 January 2007 and 31 December 2009. A total of 903 of these met the inclusion criteria for the current study and were included. **Outcome measures:** The primary outcome measure was SA following RTI. The secondary outcome measure was HRQoL. **Results:** Three distinct patterns of SA were identified; 'Stable', 'Quick decrease' and 'Gradual decrease'. The patterns differed in the number of initial SA days and the rate of reduction of SA days. After 3 years, all three patterns had almost the same level of SA. Higher injury severity and a higher number of SA days had a negative interplay with HRQoL. Participants who initially had a higher number of SA days were more likely to report a low HRQoL, indicating that people with a slower return to work are more vulnerable.

Conclusion: The study highlights the heterogeneity of return to work after an RTI. People with a more severe injury and slower pace of return to work seem to be more vulnerable with regards to HRQoL loss following RTI

**Rissanen et al. 2019.**

**BMJ Open, vol. 9, no. 7.**

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**Keywords:** Quality of life; Register-based cohort; Return to work; Road traffic injury

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/9/7/e031132.long>

### **Injured worker experiences of insurance claim processes and return to work: a national, cross-sectional study.**

Background: Insurance claims management practices may have a significant impact on the health and experiences of injured workers claiming in workers' compensation systems. There are few multi-jurisdictional studies of the way workers experience compensation processes, and limited data on the association between claims experience and return to work outcomes. This study sought to identify worker, claim and injury related factors associated with injured worker experiences of workers' compensation claims management processes, and to examine associations between claims experience and return to work. Methods: A national, cross-sectional survey of injured workers involved in ten Australian workers' compensation schemes. A total of 10,946 workers completed a telephone survey at 6 to 24 months post claim acceptance. Predictors of positive or negative/neutral claims experience were examined using logistic regression. Associations between claims experience, return to work status and duration of time loss were examined using logistic regression. Results: Nearly one-quarter (23.0%, n = 2515) of workers reported a negative or neutral claims experience. Injury type, jurisdiction of claim, and time to lodge claim were most strongly associated with claims experience. Having a positive claims experience was strongly associated with having returned to work after accounting for injury, worker, claim and employer factors. Conclusions: There is a strong positive association between worker experiences of the insurance claims process and self-reported return to work status. Revision and reform of workers' compensation claims management practices to enhance worker experience and the fairness of procedures may contribute to improved return to work outcomes.

**Collie et al. 2019.**

**BMC Public Health, vol. 19, no. 1**

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**Keywords:** Claims management; Experience; Injury; Insurance medicine; Return to work; Workers' compensation

**Evidence Level:** 4A

**Link:** <https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-019-7251-x>

### **Changes in income after an industrial accident according to industry and return-to-work status.**

Objective: To investigate changes in the incomes of workers, particularly those in the construction sector, who experienced industrial accidents according to their status of return to work. Methods: We used data from the fifth Panel Study of Workers' Compensation Insurance. A repeated measures ANOVA was used to compare annual differential incomes before and after the industrial accident, and a linear mixed model was used to investigate the changes in income from before to after the industrial accident according to the industry and return-to-work status. Results: A comparison of the industrial categories revealed that construction industry workers exhibited the greatest incomes before the accident and the greatest decrease in income after the industrial accident. Regression analysis for assessing changes in income after the industrial accident showed



that a comparison by industry revealed a significantly greater reduction in income in the construction than service industry. A comparison by work status revealed significantly greater decreases in income in the reemployment and non-return to work groups than among those who returned to their original work. Conclusions: The economic statuses of the victims of industrial accidents decreased relative to the pre-accident statuses in all industries. The ability to return to original work is important for preserving the accident victim's economic status.

**Bae et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Industrial accident; Industry; Return-to-work status; Workers' compensation insurance

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16142603>

### *Work ability*

#### **What are the key workplace influences on pathways of work ability? A six-year follow up.**

**Objective:** To study the trajectories of work ability and investigate the impact of multisite pain and working conditions on pathways of work ability over a six-year period. **Methods:** The longitudinal study was conducted with Finnish food industry workers (n = 866) with data collected every 2 years from 2003-2009. Questions covered musculoskeletal pain, physical and psychosocial working conditions (physical strain, repetitive movements, awkward postures; mental strain, team support, leadership, possibility to influence) and work ability. Latent class growth analysis and logistic regression were used to analyse the impact of multisite pain and working conditions on work ability trajectories (pathways). **Results:** Three trajectories of work ability emerged: decreasing (5%), increasing (5%), and good (90%). In the former two trajectories, the mean score of work ability changed from good to poor and poor to good during follow-up, while in the latter, individuals maintained good work ability during the follow-up. In the multivariable adjusted model, number of pain sites was significantly associated with higher odds of belonging to the trajectory of poor work ability (Odds ratio (OR) 4 pain sites 2.96, 1.25-7.03). **Conclusions:** A substantial number of employees maintained good work ability across the follow up. However, for employees with poor work ability, multisite musculoskeletal pain has an important influence, with effective prevention strategies required to reduce its prevalence.

**Oakman et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Multisite pain; Musculoskeletal pain; Physical hazards; Psychosocial hazards; Trajectories; Work ability; Work environment

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/1660-4601/16/13/2363>

#### **Is the association between precarious employment and mental health mediated by economic difficulties in males? Results from two Italian studies.**

**Background:** Flexible employment is increasing across Europe and recent studies show an association with poor mental health. The goal of the current study is to examine this association in the Italian population to assess the possible mediating role of financial strain. **Methods:** Data were obtained by two Italian cross-sectional studies (PASSI and HIS) aimed at monitoring the general population health status, health behaviours and determinants. Mental health status was assessed using alternatively two validated questionnaires (the PHQ-2 and the MCS-12 score) and Poisson regression models were performed to assess if precarious work was associated with poor mental

health. A formal mediation analysis was conducted to evaluate if the association between precarious work and mental health was mediated by financial strain. Results: The analyses were performed on 31,948 subjects in PASSI and on 21,894 subjects in HIS. A nearly two-fold risk of depression and poor mental health was found among precarious workers, compared to workers with a permanent contract, which was strongly mediated by financial strain. Conclusions: Even with the limitations of a cross-sectional design, this research supports that precarious employment contributes through financial strain to reduce the mental health related quality of life and to increase mental disorders such as symptoms of depression or dysthymia. This suggests that when stability in work cannot be guaranteed, it would be appropriate to intervene on the wages of precarious jobs and to provide social safety nets for ensuring adequate income.

**Ferrante et al. 2019.**

**BMC Public Health, vol. 19, no. 1.**

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**Keywords:** Financial strain; Mediation analysis; Precarious work; mental health

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7243-x>

### **Asthma impacts on workplace productivity in employed patients who are symptomatic despite background therapy: A multinational survey.**

Background: Asthma affects millions of people worldwide, with many patients experiencing symptoms that affect their daily lives despite receiving long-term controller medication. Purpose: Work is a large part of most people's lives, hence this study investigated the impact of uncontrolled asthma on work productivity in adults receiving asthma maintenance therapy. Patients and methods: An online survey was completed by employed adults in Brazil, Canada, Germany, Japan, Spain and the UK. Participants were confirmed as symptomatic using questions from the Royal College of Physicians' 3 Questions for Asthma tool. The survey contained the Work Productivity and Activity Impairment - Specific Health Problem questionnaire and an open-ended question on the effect of asthma at work. Results: Of the 2,055 patients on long-term maintenance therapy screened, 1,598 were symptomatic and completed the survey. The average percentage of work hours missed in a single week due to asthma symptoms was 9.3%, ranging from 3.5% (UK) to 17.4% (Brazil). Nearly three-quarters of patients reported an impact on their productivity at work caused by asthma. Overall work productivity loss (both time off and productivity whilst at work) due to asthma was 36%, ranging from 21% (UK) to 59% (Brazil). When asked how asthma made participants feel at work, many respondents highlighted how their respiratory symptoms affect them. Tiredness, weakness and mental strain were also identified as particular challenges, with respondents describing concerns about the perception of colleagues and feelings of inferiority. Conclusions: This study emphasizes the extent to which work time is adversely affected by asthma in patients despite the use of long-term maintenance medication, and provides unique personal insights. Strategies to improve patients' lives may include asthma education, optimizing asthma management plans and running workplace well-being programs. Clinicians, employers and occupational health teams should be more aware of the impact of asthma symptoms on employees, and work together to help overcome these challenges.

**Gruffydd-Jones et al. 2019.**

**Journal of Asthma and Allergy, vol. 12.**

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

**Keywords:** Asthma; Burden; Costs; Work productivity

**Evidence Level:** 4B

**Link:** <https://www.dovepress.com/asthma-impacts-on-workplace-productivity-in-employed-patients-who-are-peer-reviewed-article-JAA>



### **Intention to retire in employees over 50 Years. What is the role of work ability and work life satisfaction?**

Background: We investigated work ability and trajectories of work life satisfaction (WLS) as predictors of intention to retire (ITR) before the statutory age. Methods: Participants were Finnish postal service employees, who responded to surveys in 2016 and 2018 (n = 1466). Survey measures included ITR, work ability and WLS. Mixture modelling was used to identify trajectories of WLS. A generalized linear model was used to determine the measures of association (Risk Ratios, RR; 95% Confidence Intervals, CI) between exposures (work ability and WLS) and ITR. Results: Approximately 40% of respondents indicated ITR. Four distinct trajectories of WLS were identified: high (33%), moderate (35%), decreasing (23%) and low (9%). Participants with poor work ability (RR 1.79, 95% CI 1.40-2.29) and decreasing WLS (1.29, 1.13-1.46) were more likely to indicate an ITR early compared to the participants with excellent/good work ability and high WLS. Job control mediated the relationship between ITR and work ability (9.3%) and WLS (14.7%). Job support also played a similar role (14% and 20.6%). Conclusions: Work ability and WLS are important contributors to the retirement intentions of employees. Ensuring workers have appropriate support and control over their work are mechanisms through which organisations may encourage employees to remain at work for longer.

**Prakash et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Ageing workers; Intention to retire; Psychosocial work exposures; Work ability; Work wellbeing

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/16/14/2500>

### **A sustainable career perspective of work ability: The importance of resources across the lifespan.**

In this study, we examine employees' perceptions of their work ability from a sustainable career perspective. Specifically, we investigate the role of a person's perceived current fit (i.e., autonomy, strengths use and needs-supply fit), and future fit with their job as resources that affect perceived work ability, defined as the extent to which employees feel capable of continuing their current work over a longer time period. In addition, we test whether meaningfulness of one's work mediates this relationship, and we address the moderating role of age. Our hypotheses were tested using a sample of 5205 employees working in diverse sectors in Belgium. The results of multi-group Structural Equation Modelling (SEM) provide mixed evidence for our hypotheses. While all four resources were significantly and positively related to perceived meaningfulness, only needs-supply fit was positively related to perceived work ability. Strengths use, on the other hand, was also significantly related to perceived work ability, yet in a negative way. These findings underscore the importance of distinguishing between several types of resources to understand their impact upon perceived work ability. Interestingly, the relationship between future-orientedness of the job and perceived work ability was moderated by age, with the relationship only being significant and positive for middle-aged and senior workers. This suggests an increasingly important role of having a perspective of future fit with one's job as employees grow older. Contrary to our expectations, meaningfulness did not mediate the relationships between resources and perceived work ability. We discuss these findings and their implications from the perspective of sustainable career development.

**Stuer et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Age; Future-orientedness of the job; Meaningfulness of work; Perceived fit with current job; Perceived work ability; Sustainable careers

**Evidence Level:** 4A

**Link:** <https://www.mdpi.com/1660-4601/16/14/2572>

### **Childhood adversities, parental education and disability retirement among Finnish municipal employees.**

**Background:** There is increasing evidence that childhood socioeconomic position and childhood adversities influence adult health. However, the potential contribution of these factors to disability retirement is poorly understood. This study aimed to examine the associations between childhood adversities, parental education and disability retirement. **Methods:** Data on parental education and childhood adversities were derived from the Helsinki Health Study baseline survey, conducted in 2000-02 among 40- to 60-year old employees of the City of Helsinki, Finland. Data on disability retirement and their diagnoses were obtained from the Finnish Centre of Pensions and followed until the end of 2016. The analyses included 5992 employees. The associations of parental education and childhood adversities with disability retirement due to any cause, musculoskeletal diseases and mental disorders were analysed using Cox regression analysis. **Results:** Low parental education was associated with an increased risk of disability retirement due to any cause (maternal education: HR 1.74, 95% CI 1.16-2.62; paternal education: 1.86, 1.38-2.51) and due to musculoskeletal diseases (maternal education: 4.44, 1.66-11.92; paternal education: 3.81, 2.02-7.17). However, adjustment for own education mainly abolished the associations. Economic difficulties in the childhood family, parental alcohol problems and having been bullied at school or by peers increased the risk of disability retirement due to all studied diagnostic groups, whereas parental death or divorce had no effect. Childhood illness (1.53, 1.20-1.95) and parental mental illness (1.68, 1.28-2.20) were associated with disability retirement due to any cause and due to mental disorders (1.65, 1.05-2.59; 3.60, 2.46-5.26). The associations between childhood adversities and disability retirement remained after adjustment for own education, whereas working conditions, and weight and health behaviours somewhat attenuated the associations. **Conclusions:** Parental education and childhood adversities contributed to disability retirement even in midlife. Policy actions investing in children's well-being might promote work ability in midlife.

**Salonsalmi et al. 2019.**

**PLoS One, vol. 14, no. 7.**

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**Keywords:** Childhood adversities; Parental education; Disability retirement; Socioeconomic position; Work ability

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219421>

### **Relationships of leisure-time physical activity and work ability between different occupational physical demands in adult working men.**

**Purpose:** Leisure-time physical activity (LTPA) is known to be associated with positive health benefits, but the role of occupational physical demands remains inconsistent. The purpose of the current study was to assess the relationship between LTPA and work ability in different occupational physical activity (OPA) levels between young adult men. **Methods:** We performed physical activity measurements in work and leisure time with the long version of International Physical Activity Questionnaire (IPAQ) and work ability with the Work Ability Index (WAI) in 921 Finnish employed male volunteer participants. The participants were divided into LTPA tertiles I

(< 8 MET-h/week), II (8-28 MET-h/week), and III (> 28 MET-h/week) and OPA tertiles I (0 MET-h/week), II (< 64 MET-h/week), and III ( $\geq$  64 MET-h/week). Results: There was a significant relationship between LTPA and WAI in OPA tertiles (adjusted for age, alcohol consumption, working class status, BMI, and employment years). Moreover, each LTPA tertile showed significant linear associations with WAI ( $P < 0.001$ ). Conclusion: LTPA is positively associated with work ability among young adult men. More specifically, the relationships between LTPA and WAI were significantly greater in physically demanding jobs than in more passive jobs. Our results indicate the importance of LTPA, particularly with individuals under higher work-related physical strain.

**Paivarinne et al. 2019.**

**International Archives of Occupational and Environmental Health, vol. 92, no. 5.**

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**Keywords:** Exercise; MET; Occupational health; Occupational physical demands; Questionnaires

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007%2Fs00420-019-01410-x>

### **How do cardiovascular diseases harm labor force participation? Evidence of nationally representative survey data from Japan, a super-aged society.**

**Objective:** To evaluate how cardiovascular diseases harm labor force participation (LFP) among the Japanese population and verify the validity of plasma biomarkers as instrumental variables of cardiovascular diseases after adjusting for a broad set of confounders including dietary intake.

**Design:** Using nationally representative repeated cross-sectional surveys in Japan, the Comprehensive Survey of Living Conditions and National Health and Nutrition Survey, with plasma biomarkers as instrumental variables for quasi-randomization. **Setting:** Onset of cardiovascular diseases in those receiving regular treatment for hypertension, intracerebral hemorrhage, intracerebral infarction, angina pectoris, myocardial infarction, or other types of cardiovascular diseases. **Participants:** A total of 65,615 persons aged  $\geq 20$  years (35,037 women and 30,578 men) who completed a survey conducted every three years from 1995 through 2013. **Outcome measures:** Respondent employment and weekly working hours during each survey year. **Results:** Cardiovascular diseases significantly and remarkably reduced the probability of working by 15.4% (95% CI: -30.6% to -0.2%). The reduction in working probability was detected for women only. Respondents aged  $\geq 40$  years were less likely to work once diagnosed and the reduction was enlarged for those aged  $\geq 65$  years, while those aged  $< 40$  years appeared to be unaffected. Probability of engaging in manual labor significantly decreased once diagnosed; however, no impact was found for cognitive occupations. Among employed respondents, the adverse effects of cardiovascular diseases decreased working hours by five hours per week. Validity of the biomarker instrumental variables was generally verified. **Conclusions:** A vicious circle is suggested between LFP and unfavorable health. However, the effects vary across age, sex, and occupation type, even after adjusting for causal effects, which could cause a downward bias in LFP impact.

**Fu et al. 2019.**

**PLoS One, vol. 14, no. 7.**

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**Keywords:** Cardiovascular diseases, Labor force participation, Health, Plasma biomarkers

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219149>

### **Need for recovery and different types of early labour force exit: A prospective cohort study among older workers.**

**Purpose:** This study examines the relationship between need for recovery (NFR) and labour force exit (LFE) among older workers. Different types of LFE (early retirement, work disability and unemployment) are considered, and the role of potential confounding and modifying factors, including the availability of early LFE schemes, is examined. Also, associations between NFR and the intention and ability to prolong one's working life, which are known determinants of LFE, are assessed. **Methods:** A subsample of older workers from the Maastricht Cohort Study was examined (n = 2312). The relationship between NFR and LFE was investigated by means of Cox regression analyses. Logistic regression analyses were performed to investigate cross-sectional associations between NFR and the intention and ability to prolong working life. **Results:** Elevated NFR was associated with a higher risk of overall LFE during a 4-year follow-up period (HR 1.39, 95% CI 1.09-1.78), and specifically with a higher risk of leaving the labour force through early retirement and work disability. When early retirement schemes were available, strong and significant associations between NFR and LFE were observed (HR 2.79, 95% CI 1.29-6.02), whereas no significant associations were found when such schemes were unavailable. Older workers with a higher NFR also had earlier retirement intentions and lower self-assessed abilities (both physical and mental) to prolong their working life until the mandatory retirement age. **Conclusions:** Because this study shows that NFR is a precursor of LFE among older workers, monitoring NFR is important for timely interventions aimed at reducing NFR to facilitate extended labour participation.

**Stynen et al. 2019.**

**International Archives of Occupational and Environmental Health, vol. 92, no. 5.**

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**Keywords:** Early labour force exit; Need for recovery; Older workers; Retirement intentions

**Evidence Level:** 4B

**Link:** <https://dx.doi.org/10.1007/s00420-019-01404-9>

### *Shift work*

#### **Application of a limit-cycle oscillator model for prediction of circadian phase in rotating night shift workers.**

Practical alternatives to gold-standard measures of circadian timing in shift workers are needed. We assessed the feasibility of applying a limit-cycle oscillator model of the human circadian pacemaker to estimate circadian phase in 25 nursing and medical staff in a field setting during a transition from day/evening shifts (diurnal schedule) to 3-5 consecutive night shifts (night schedule). Ambulatory measurements of light and activity recorded with wrist actigraphs were used as inputs into the model. Model estimations were compared to urinary 6-sulphatoxymelatonin (aMT6s) acrophase measured on the diurnal schedule and last consecutive night shift. The model predicted aMT6s acrophase with an absolute mean error of 0.69 h on the diurnal schedule (SD = 0.94 h, 80% within  $\pm 1$  hour), and 0.95 h on the night schedule (SD = 1.24 h, 68% within  $\pm 1$  hour). The aMT6s phase shift from diurnal to night schedule was predicted to within  $\pm 1$  hour in 56% of individuals. Our findings indicate the model can be generalized to a shift work setting, although prediction of inter-individual variability in circadian phase shift during night shifts was limited. This study provides the basis for further adaptation and validation of models for predicting circadian phase in rotating shift workers.

**Stone et al. 2019.**

**Scientific Reports, vol. 9, no. 1.**

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**Keywords:** Night shift, Shift workers, Circadian timing, Prediction, Circadian phase

**Evidence Level:** 4A

**Link:** <https://www.nature.com/articles/s41598-019-47290-6>

### **Decreased psychomotor vigilance of female shift workers after working night shifts.**

Background: We compared psychomotor vigilance in female shift workers of the Bergmannsheil University Hospital in Bochum, Germany (N = 74, 94% nurses) after day and night shifts. Methods: Participants performed a 3-minute Psychomotor Vigilance Task (PVT) test bout at the end of two consecutive day and three consecutive night shifts, respectively. Psychomotor vigilance was analyzed with respect to mean reaction time, percentage of lapses and false starts, and throughput as an overall performance score, combining reaction time and error frequencies. We also determined the reaction time coefficient of variation (RTCV) to assess relative reaction time variability after day and night shifts. Further, we examined the influence of shift type (night vs. day) by mixed linear models with associated 95% confidence intervals (CI), adjusted for age, chronotype, study day, season, and the presence of obstructive sleep apnea (OSA). Results: At the end of a night shift, reaction times were increased ( $\beta = 7.64$ ; 95% CI 0.94; 14.35) and the number of lapses higher compared to day shifts ( $\exp(\beta) = 1.55$ ; 95% CI 1.16-2.08). By contrast, we did not observe differences in the number of false starts between day and night shifts. Throughput was reduced after night shifts ( $\beta = -15.52$ ; 95% CI -27.49; -3.46). Reaction times improved across consecutive day and night shifts, whereas the frequency of lapses decreased after the third night. RTCV remained unaffected by both, night shifts and consecutive shift blocks. Discussion: Our results add to the growing body of literature demonstrating that night-shift work is associated with decreased psychomotor vigilance. As the analysis of RTCV suggests, performance deficits may selectively be driven by few slow reactions at the lower end of the reaction time distribution function. Comparing intra-individual PVT-performances over three consecutive night and two consecutive day shifts, we observed performance improvements after the third night shift. Although a training effect cannot be ruled out, this finding may suggest better adaptation to the night schedule if avoiding fast-changing shift schedules.

**Behrens et al. 2019.**

**PLoS One, vol. 14, no. 7.**

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**Keywords:** Psychomotor vigilance, Female, Shift workers, Night shifts, Preferring, Shift schedules

**Evidence Level:** 4A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219087>

### *Working hours*

#### **Long working hours, sleep-related problems, and near-misses/injuries in industrial settings using a nationally representative sample of workers in Japan.**

Long working hours and a lack of sleep have been suggested to negatively affect the safety of workers. Here, we examined the association between long working hours/sleep-related problems and near-misses/injuries in industrial settings using a nationally representative sample of workers in Japan. Based on the composition ratio of workers by industry, sex, and age in Japan, data from a web-based cross-sectional survey for 18,682 participant full-time workers (7,098 female and 11,584 male; mean age, 43.7 [standard deviation 11.1] years) were analyzed. Nearly 30% and 5% of participants reported any types of near-misses during the past six months and injuries during the past year, respectively. For all types of near-misses and some types of injuries, a significant difference in frequency distribution was observed by industry. After adjustment for demographic, job-, and life-related variables, participants who worked long hours (i.e., more than 51 hours per



week) were more likely to report job-related near-misses/injuries than those who worked 35-40 hours per week. The presence of sleep-related problems was also significantly related to near-misses and injuries. However, while sleep-related problems were significantly associated with near-misses/injuries in all industries, the association between long working hours and near-misses/injuries differed by industry. Odds ratios for near-misses/injuries were strongly significant in the "transport/postal services" industry for those who worked more than 51 hours per week compared to those who worked 35-40 hours per week. Comprehensive protective measures for workers, including (1) reducing total hours of service/job-related fatigue, (2) maintaining sufficient sleep hours/good sleep, and (3) increasing awareness about the impact of overwork/long working hours and sleep-related problems on workers' safety among employers, workers, clients/customers, and the general public might be effective for preventing near-misses and injuries in industrial settings among workers, especially those who work long hours in the "transport/postal services" industry.

**Yamauchi et al. 2019.**

**PLoS One, vol. 14, no. 7.**

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**Keywords:** Working hours, Sleep problems, Near-miss, Injuries, Industrial workers, Long hours, Lack of sleep

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219657>

### **Sociomedical problems of overwork-related deaths and disorders in Japan.**

**Objectives:** Cerebrovascular and cardiovascular diseases (CCVDs) and mental disorders, including suicide, are prevalent among overworked individuals in Japan. The 2014 legislation regarding the prevention of overwork-related deaths and disorders has accelerated the research in this field and ultimately the implementation of preventive actions. **Methods:** To understand the current problematic situations, the Research Center for Overwork-Related Disorders of the National Institute of Occupational Safety and Health, Japan, conducted analyses of compensated claims for overwork-related CCVDs and mental disorders that were recognized from January 2010 to March 2015. **Results:** The majority of CCVD cases were the men in their 50s. Transport and postal activities was the highest risk industry. Cerebrovascular cases were higher than cardiovascular ones. Long working hours was the principal factor for CCVDs. The mental disorder cases comprised approximately 70% men and affected younger age groups (peak in the third decade) with various industries at risk. In men, there was an almost equal number of F3 (Mood [affective] disorders) and F4 (Neurotic, stress-related, and somatoform disorders) diagnoses according to the 10th revision of the International Classification of Diseases and Related Health Problems. A larger number of women were diagnosed to have F4. The mental disorder cases were associated not only with long working hours, but also with injuries and disasters as well as interpersonal conflict at work. **Conclusions:** Multiple, simultaneous actions need to be made by employees, employers, researchers, and the authorities to achieve the goal of reducing the number of workers suffering from the overwork-related CCVDs and mental disorders.

**Takahashi et al. 2019.**

**Journal of Occupational Health, vol. 61, no. 4.**

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**Keywords:** Excessive fatigue; Overtime legislation in Japan; Primary prevention; Psychosocial work environment; Work schedules

**Evidence Level:** 4B

**Link:** <https://onlinelibrary.wiley.com/doi/full/10.1002/1348-9585.12016>



### **The effect of changes in overtime work hours on depressive symptoms among Japanese white-collar workers: A 2-year follow-up study.**

Objective: The purpose of this study was to investigate the effect of changes in overtime work hours on depressive symptoms among Japanese white-collar workers. Methods: Participant data were collected from a company's annual mental health survey in June 2013 and June 2014. The participants comprised 922 workers who responded to the survey in both the years and had records of monthly working hours in the past 2 years. We obtained information on monthly working hours from personnel records from June 2012 to May 2014. Depressive symptoms were measured by the Brief Job Stress Questionnaire. Changes in overtime work hours were measured by creating a five-category variable for each monthly average of overtime work hours in the past year: (a) stable short, (b) decreased, (c) stable medium, (d) increased, and (e) stable long groups. Analysis of covariance was conducted to estimate the degree of depressive symptoms of each group for changes in overtime work hours. Results: Significant differences among the groups were observed ( $F = 3.67$ ,  $P = 0.006$ ). In the Bonferroni multiple comparison test, significantly lower depressive symptoms were observed in the decreased group (point estimate = 9.56) compared to the stable short (10.76), stable medium (10.71), and increased groups (10.99). There was no significant difference between the decreased group and the stable long group (10.98). Conclusions: A decrease in overtime work hours may prevent the deterioration of mental health. This knowledge could support the necessity of mental health measures through decreasing overtime work hours proposed by national policy in Japan.

**Hino et al. 2019.**

**Journal of Occupational Health, vol. 61, no. 4.**

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**Keywords:** Depressive symptoms; Longitudinal studies; Overtime work hours; Work style reform

**Evidence Level:** 4B

**Link:** <https://onlinelibrary.wiley.com/doi/full/10.1002/1348-9585.12054>

## **Enhancing Employer Capability**

### *Wellness programs*

#### **Assessing workplace health and safety strategies, trends, and barriers through a statewide worksite survey.**

Chronic diseases have added to the economic burden of the U.S. healthcare system. Most Americans spend most of their waking time at work, thereby, presenting employers with an opportunity to protect and promote health. The purpose of this study was to assess the implementation of workplace health governance and safety strategies among worksites in the State of Nebraska, over time and by industry sector using a randomized survey. Weighted percentages were compared by year, industry sector, and worksite size. Over the three study periods, 4784 responses were collected from worksite representatives. Adoption of workplace health governance and planning strategies increased over time and significantly varied across industry sector groups. Organisational safety policies varied by industry sector and were more commonly reported than workplace health governance and planning strategies. Time constraints were the most common barrier among worksites of all sizes, and stress was reported as the leading employee health issue that negatively impacts business. Results suggest that opportunities exist to integrate workplace health and safety initiatives, especially in blue-collar industry sectors and small businesses.

**Sedani et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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

**Keywords:** Barriers; Governance; Industry; Planning; Survey; Wellness; Workplace health

**Evidence Level:** 4A

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16142475>

### *Organisational support*

#### **An interpersonal perspective on HR attributions: Examining the role of line managers, coworkers, and similarity in work-related motivations.**

Given that various studies have linked Human Resource (HR) attributions to important individual and organisational outcomes, the question that arises is what causes these HR attributions. By taking an interpersonal perspective it is examined how employees both individually as well as collectively interpret HR practices. Based on social information processing theory this study among 87 line manager-employee-coworker triads shows that line managers affect HR attributions of employees, and that employees also mutually influence each other's HR attributions. This mutual influence process between coworkers is strengthened by similarity in work-related motivations. Our findings support the proposition that employees' social environment at work, particularly their line manager and coworker, matters in HR attribution processes. This stresses the importance of considering the social environment at work to more fully understand the factors that shape employees' understandings of HR practices.

**Beijer et al. 2019.**

**Frontiers in Psychology, vol. 10.**

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**Keywords:** HR attributions; Interpersonal perspective; Line manager; Motivation; Multi-level modeling; Strategic HRM; Worker

**Evidence Level:** 5B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01509/full>

#### **The moderating effect of perceived organisational support in the relationship between emotional labour and job attitudes: A study among health professionals.**

**Aim:** The present study was set out to establish the link between emotional labour (surface and deep acting) and job attitudes (job satisfaction organisational commitment) by introducing perceived organisational support as a moderating variable. **Design:** The study made use of a cross-sectional design by sampling three hundred and forty-two (342) nurses and midwives from six health facilities in Ghana. **Methods:** The study employed a quantitative approach to examine the relationships between the study variables. **Results:** The study disclosed that whereas surface acting related negatively with job satisfaction but not with organisational commitment, deep acting did not relate significantly with both job satisfaction and organisational commitment. Perceived organisational support as a moderating variable showed a significant moderating effect between surface acting and job attitudes. However, perceived organisational support moderated the relationship between deep acting and organisational commitment but not job satisfaction. The findings pose much contextual relevance to health professionals where emotional regulations are core responsibilities of health care.

**Lartey et al. 2019.**

**Nursing open, vol. 6, no. 3.**

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**Keywords:** Emotional labour; Job attitudes; Perceived organisational support

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6650690/>

### **A comparative study of the relationship among antecedents and job satisfaction in Taiwan and mainland China: Employability as mediator.**

Previous studies of the relationship between job security and job satisfaction were mostly conducted on research samples in Asia from the perspective of oriental culture; however, under the same cultural background, different social systems might lead to different cognition outcomes. Therefore, this study examines the job security and organisational support of Taiwan and mainland China employees from the perspectives of competence enhancement motivation, and investigates the relationship between employability and job satisfaction. Adopting judgmental sampling, a total of 1307 valid questionnaires were collected from Taiwan and mainland China employees. The path relationship of the two groups was examined through structural equation modeling (SEM) by using analysis of moment structure (AMOS). Results show that job security and organisational support are positive for employability and job satisfaction. Employability has a positive influence on job satisfaction. Additionally, employability has a mediating effect of job security and organisational support on job satisfaction.

**Peng et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Employability; Job satisfaction; Job security; Organisational support

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16142613>

### **How does internal and external CSR affect employees' work engagement? Exploring multiple mediation mechanisms and boundary conditions.**

We investigate the different mechanisms concerning how employees' perceptions of external and internal corporate social responsibility (CSR) serve to influence employees' work engagement. By combining social exchange theory and social identity theory, we implement and examine an integrated moderated mediation framework in which employees' value orientations (e.g., collectivism or individualism) impact the mediating mechanism between their perceived external and internal CSR, organisational pride and perceived organisational support (POS), and work engagement. This work fills a research gap to examine the indirect relationship between employees' perceptions of external and internal CSR and work engagement. Using two periods of survey data from 250 working employees in China, we find that employees' perceptions of external CSR positively influence work engagement via organisational pride. The value of collectivism strengthens the direct effect of employees' perceptions of external CSR on work engagement, and the indirect effect of employees' perceptions of external CSR on work engagement via organisational pride. Moreover, employees' perceptions of internal CSR positively influence work engagement via POS. The value of individualism strengthens the direct effect of employees' perceptions of internal CSR on work engagement, and the indirect effect of employees' perceptions of internal CSR on work engagement via POS. The results contribute to both theory and practice.

**Jia et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Collectivism; Corporate social responsibility; Individualism; Organisational pride; Perceived organisational support; Work engagement

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/16/14/2476>

## **The view and policy of management of occupational health services on the performance of workers' health surveillance: A qualitative exploration.**

Background: Although workers' health surveillance is an important preventive activity, it is not regularly performed. In addition to the occupational physician, the management of occupational health services can also be involved in the performance of workers' health surveillance. The present study investigated the view and policy of the managements of occupational health services on the performance of workers' health surveillance by occupational physicians. Method: Semi-structured face-to-face interviews about the mission, view, and policy of the occupational health services with respect to workers' health surveillance were conducted with eighteen randomly selected board members of occupational health services in the Netherlands. The results were transcribed verbatim and were analysed using MAXQDA software to form themes and categories. Results: The first theme found was the view of the management of occupational health services. Categories found were mission statements of occupational health services and the attitude of the management of occupational health services towards workers' health surveillance. Three types of mission statements were mentioned by the board members: keeping workers at work, improving the health of workers, or helping the employer with sick-leave management. Both positive and negative attitudes towards workers' health surveillance appeared from the interviews. Some board members mentioned that workers' health surveillance can improve workers' health, and creates awareness about workers' health. Other board members mentioned that performing workers' health surveillance is eliciting problems, and that employers do not have a positive attitude towards workers' health surveillance. The second theme was the policy on performing workers' health surveillance. Categories found were the policy on performing workers' health surveillance towards companies, and the policy on performing workers' health surveillance towards professionals. Some occupational health services recommend workers' health surveillance to all companies. However, in general workers' health surveillance was only performed at request of companies, and no instructions or training programmes for occupational physicians were provided. Conclusion: Although some of the mentioned views on workers' health surveillance are positive, the policy of occupational health services on workers' health surveillance does, so far, in general, not stimulate occupational physicians or employers to perform or organize workers' health surveillance.

**Los et al. 2019.**

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

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**Keywords:** Management; Occupational health service; Occupational physician; Workers' health surveillance

**Evidence Level:** 5B

**Link:** <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4296-6>

## **Managing the (In)visibility of chronic illness at work: Dialogism, parody, and reported speech.**

Interactionally, the workplace may be dilemmatic for a person with "invisible" chronic illness. Risks of stigmatization exist if they disclose their condition to colleagues. Meanwhile, not disclosing threatens well-being and entitlements. Using Bakhtin's dialogism as a theoretical framework, we explored these social aspects of illness: inductively analyzing narratives from 20 participants with multiple sclerosis (MS). Capitalizing on concepts from dialogical and conversation analysis, links between (in)visibility, knowledge, and belief were examined with respect to symptoms and co-worker judgment. Perceived medical legitimacy creates a core social dilemma. At the intersection of genre and action, participants systematically used parody to subvert the traditional workplace hierarchy. "Oh-prefaced" direct reported speech (OPDRS) was deployed to exaggerate workplace interactions, undermining managers/colleagues who misattributed (in)visible symptoms. Parodic

OPDRS index emotive interactional dilemmas. As subversions of organisational power, OPDRS denote those very areas where employees feel disempowered. Sensitivity to OPDRS can provide diagnostic support and complement evaluation frameworks.

**Thompson et al. 2019.**

**Qualitative Health Research, vol. 29, no. 8.**

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**Keywords:** United Kingdom; Chronic illness; Conversation analysis; Dialogical analysis; Focus groups; Job retention; Multiple sclerosis; Parody; Qualitative; Reported speech

**Evidence Level:** 5A

**Link:** [http://journals.sagepub.com/doi/full/10.1177/1049732319825843?url\\_ver=Z39.88-2003&rfr\\_id=ori:rid:crossref.org&rfr\\_dat=cr\\_pub%3dpubmed](http://journals.sagepub.com/doi/full/10.1177/1049732319825843?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed)

### *Organisational issues*

**Prevalence of workplace discrimination and mistreatment in a national sample of older U.S. workers: The REGARDS cohort study.**

Although workplace discrimination and mistreatment (WDM) has recently drawn widespread media attention, our understanding of the prevalence of these phenomena remains limited. In the current study, we generated national prevalence estimates of WDM from a community-based cohort of employed black and white men and women aged  $\geq 48$  years. Measures of WDM in the current job were obtained by computer-assisted telephone interview (2011-2013) involving dichotomous responses (yes or no) to five questions and deriving a composite measure of discrimination (yes to at least one). Prevalence estimates and age- and region-adjusted prevalence ratios were derived with use of SUDAAN software to account for the complex sample design. Analyses were stratified by race and sex subgroups. This sample represents over 40 million U.S. workers aged  $\geq 48$  years. The prevalence of workplace discrimination ranged from a high of 25% for black women to a low of 11% for white men. Blacks reported a 60% higher rate of discrimination compared to whites; women reported a 53% higher prevalence of discrimination, compared with men. The prevalence of workplace mistreatment ranged from 13% for black women to 8% for white men. Women reported a 52% higher prevalence of mistreatment compared to men, while differences by race were not significant. Mistreatment was 4-8 times more prevalent among those reporting discrimination than among those reporting none. Subgroup differences in mistreatment were confined to the wage-employed. Findings suggest that middle age and older wage-employed blacks and women experience the highest prevalence of WDM; moreover, discrimination is strongly associated with mistreatment. This study contributes to our understanding of at-risk segments of the U.S. labor market and the need for targeted interventions to reduce WDM.

**Fekedulegn et al. 2019.**

**SSM Population Health, vol. 8.**

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**Keywords:** Ageism; Harassment; Mistreatment; Racism; Sexism; Workplace discrimination

**Evidence Level:** 4A

**Link:** <https://www.sciencedirect.com/science/article/pii/S2352827319300588?via%3Dihub>



### **Women at work: Changes in sexual harassment between September 2016 and September 2018.**

Over the last two years, awareness about the sexual mistreatment of women has stunned the world. According to analysis by the New York Times, the defeat of Hilary Clinton and election of Donald Trump spurred a women's movement in the US that began in November of 2016 and resulted in protests across the country, including the largest single-day protest in history on January 21, 2017. Later that year, the #MeToo movement (starting in October 2017) and subsequent #TimesUp movement (starting in January 2018) galvanized women to unite against sexual assault and sexual harassment, which has become the hallmark of the current women's movement. But has anything changed over this time period in regard to the sexual harassment of women? Using a repeat cross-sectional survey from over 500 women collected at two points in time (September 2016 and September 2018), we found reduced levels of the most egregious forms of sexual harassment (unwanted sexual attention and sexual coercion) but increased levels of gender harassment in 2018. More importantly, sexual harassment had a weaker relationship with women's negative self-views (lower self-esteem, higher self-doubt) in 2018 compared to 2016. Qualitative interviews collected from women in the fall of 2016 and in the fall of 2018 from the same women, support the quantitative data. They suggest that the changes in sexual harassment are due to the increased scrutiny on the topic. The interviewees also emphasize that they feel better supported and empowered and are not ashamed to speak up about sexual harassment.

**Keplinger et al. 2019.**

**PLoS One, vol. 14, no. 7.**

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**Keywords:** Women at work, Sexual harassment, Self-esteem, Self-doubt

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0218313>

### **Factors influencing the implementation of a pilot smoking cessation intervention among migrant workers in Chinese factories: A qualitative study.**

Background: Tobacco control intervention with Chinese internal migrants, especially those working in factories has rarely been investigated. This study aims to identify aids and barriers to implementing a comprehensive pilot intervention aimed at reducing smoking among migrant workers working in factories in China. Method: Twenty in-depth interviews were conducted 3 months into the intervention, with managers, migrant workers and team leaders in two factories, where the pilot intervention was implemented, in Zhongshan city in Guangdong, a southern Chinese province. Data analysis was based on the thematic approach. Results: This study identifies the societal, individual and programmatic factors that could influence the implementation of a pilot smoking cessation intervention among migrant workers in the two Chinese factories. At the societal level, social customs and relationships where smoking is seen as essential in social communications was the most important barrier to the implementation of smoking cessation intervention. At the individual level, migrant-related features such as low education, high mobility and poor integration with local residents, together with poor health beliefs and attitudes added to the challenges of implementing smoking cessation intervention. At the programmatic level, the role of small-team leaders was generally positive, although limited due to their busy work patterns and poor powers of enforcement. Conclusion: Achieving successful smoking cessation intervention in factories could be challenging with many migrants, as multi-level factors including social context, intervention delivery, individual and migrants' characteristics play an important role in shaping the implementation of the intervention. Our study suggests the importance of tailoring interventions for the migrant factory workers.

**Zou et al. 2019.**



**BMC Public Health, vol. 19, no. 1.**

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**Keywords:** China; Factories; Internal migrants; Intervention; Smoking cessation

**Evidence Level:** 5B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7223-1>

**Sitting less at work: a qualitative study of barriers and enablers in organisations of different size and sector.**

Background: Prolonged sitting is associated with a range of chronic health conditions and working in office-based jobs is an important contributor to total daily sitting time. Consequently, interventions to reduce workplace sitting have been developed and tested; however, no single intervention strategy consistently produces reductions in workplace sitting time. Exploring barriers and enablers to sitting less at work has been shown to support the development of more effective interventions. In order to address these barriers and enablers during the development and implementation of sit less at work interventions, it is important to understand how they may differ in different types of organisation, an area which has not yet been explored. The main aim of this study was to determine whether barriers and enablers to sitting less at work varied between organisations of different size and sector. Methods: A qualitative study design was used. Four organisations of different sizes and sectors participated: a small business, a charity, a local authority and a large corporation. A total of ten focus groups comprising 40 volunteer employees were conducted. Focus groups were audio-recorded and transcribed verbatim. Transcripts were then thematically analysed using pre-defined themes, but analysis also allowed for emergence of additional themes. Results: Barriers and enablers which were consistently raised by participants across all four organisations primarily included: individual-level factors such as habits and routines, and personal motivations and preferences; and factors relating to the internal physical environment. Barriers and enablers that differed by organisation mainly related to: organisational-level factors such as organisational culture, organisation size, and ways of working; and factors relating to the broader social, economic and political context such as the idea of presenteeism, and the impact of wider economic and political issues. Conclusions: This study found that although some themes were consistently raised by participants from organisations of different size and sector, participants from these organisations also experienced some different barriers and enablers to sitting less at work. For future research or practice, the study findings highlight that organisation-specific barriers and enablers need to be identified and addressed during the development and implementation of sit less at work interventions.

**Mackenzie et al. 2019.**

**BMC Public Health, vol. 19, no. 1.**

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**Keywords:** Barriers and enablers; Focus groups; Occupation; Organisational culture; Qualitative; Sedentary behaviour; Sitting; Workplace

**Evidence Level:** 5A

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7148-8>

## The Future of Work

### Technology

#### **How do mobile health applications support behaviour changes? A scoping review of mobile health applications relating to physical activity and eating behaviours.**

**Objective:** The objective of this review was to analyse how researchers conducting studies about mobile health applications (MHApps) effectiveness assess the conditions of this effectiveness.

**Study design:** A scoping review according to PRIMSA-ScR checklist. **Methods:** We conducted a scoping review of efficacy/effectiveness conditions in high internal validity studies assessing the efficacy of MHApps in changing physical activity behaviours and eating habits. We used the PubMed, Web of Science, SPORTDiscus and PsycINFO databases and processed the review according to the O'Malley and PRISMA-ScR recommendations. We selected studies with high internal validity methodologies (randomised controlled trials, quasi-experimental studies, systematic reviews and meta-analyses), dealing with dietary and/or physical activity behaviours; covering primary, secondary or tertiary prevention and dealing with behaviour change (uptake, maintenance). We excluded articles on MHApps relating to high-level sport and telemedicine. The process for selecting studies followed a set protocol with two authors who independently appraised the studies. **Results:** Twenty-two articles were finally selected and analysed. We noted that the mechanisms and techniques to support behaviour changes were poorly reported and studied. There was no explanation of how these MHApps work and how they could be transferred or not. Indeed, the main efficacy conditions reported by authors refer to practical aspects of the tools. Moreover, the issue of social inequalities was essentially reduced to access to the technology (the shrinking access divide), and literacy was poorly studied, even though it is an important consideration in digital prevention. All in all, even when they dealt with behaviours, the evaluations were tool-focused rather than intervention-focused and did not allow a comprehensive assessment of MHApps. **Conclusion:** To understand the added value of MHApps in supporting behaviour changes, it seems important to draw on the paradigms relating to health technology assessment considering the characteristics of the technologies and on the evaluation of complex interventions considering the characteristics of prevention. This combined approach may help to clarify how these patient-focused MHApps work and is a condition for improved assessment of MHApps in terms of effectiveness, transferability and scalability.

**Aromatario et al. 2019.**

**Public Health, vol. 175.**

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**Keywords:** Behaviour; Eating habits; Effectiveness; Physical activity; Prevention; e-health

**Evidence Level:** 6A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0033350619302070?via%3Dihub>

#### **Negative influences of the 4th industrial revolution on the workplace: Towards a theoretical model of entropic citizen behavior in toxic organizations.**

The 4th industrial revolution, referred to as a 'second coming' of the 'digital era,' has introduced both positive and negative effects on the workplace. While digitalization and automation have taken the drudgery out of work for some and released them to enjoy qualitative improvements at work and higher salaries, others have been thrust into low-paying work and unemployment with negative effects on their well-being and mental health. In many cases stress and threats of job loss created by digital era automation have generated negative workplace behavior and workplace outcomes. The 4th industrial revolution and its burgeoning information technology have presented widespread access to information to stakeholders and the general public about organisational business and environmental performance. This open access to information has

driven toxic business leaders to maintain company profitability and environmental sustainability by pressuring employees to find solutions to difficult organisational problems with short timelines attached. Employees often are required to 'go the extra mile' to achieve organisational goals through forms of organisational citizenship behavior. Additionally, although organisational citizenship behavior can generate significant benefits for a company, toxic and entropic workplace outcomes can also occur from its more extreme manifestations arising from the stressful circumstances digitalization and automation of work have created. The methodological approach adopted in this paper is a secondary data analysis which uses reliable and valid sources of report documentation to corroborate a theoretical model of organisational citizenship behavior entropy. The theoretical model suggests that extreme forms of organisational citizenship behavior associated with the digital era can create toxic leaders and business organizations that lead to organisational entropy.

**Coldwell et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 15.**

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**Keywords:** 4th industrial revolution; Workplace; Entropic citizenship behavior, Toxic organizations

**Evidence Level:** 6B

**Link:** <https://www.mdpi.com/1660-4601/16/15/2670>

### **Employee acceptance of wearable technology in the workplace.**

This study explored the factors that predict the acceptability of wearables for workers via an on-line survey of 1273 adult worker. The study found that wearables focused on workplace safety were most accepted, with a worker's performance expectancy, the company's safety climate and the ability of employees to choose the device affecting acceptance. The authors concluded that when implementing implement wearable technology companies should (a) focus its use on improving workplace safety, (b) advance a positive safety climate, (c) ensure sufficient evidence to support workers' beliefs that the wearable will meet its objective, and (d) involve and inform workers in the process of selecting and implementing wearable technology.

**Jacobs et al. 2019.**

**Applied Ergonomics, vol. 78.**

**Keywords:** Technology acceptance; Wearable technology; Safety climate; Industrial workplace ergonomics; Work measurement

**Evidence Level:** 4A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0003687018306094?via%3Dihub>

### *Work environment*

#### **Coworking spaces: The better home office? A psychosocial and health-related perspective on an emerging work environment.**

With the ongoing flexibilization of work, new trends concerning work outside the company's premises such as coworking spaces are on the rise. Coworking spaces are designed to offer collaboration and community in furnished and equipped workspaces on a rental base. There is a growing body of scientific literature on coworking spaces with empirical results of qualitative and quantitative research. The present study adds to the latter by examining psychosocial demands experienced by coworkers in Germany based on a quantitative survey (n = 112). Among coworkers the home office was or still is another frequently used workplace. However, can the coworking space be seen as a better alternative to the home office in terms of work- and performance-related, social, environmental and health-related aspects? Results showed moderate to low psychosocial demands regarding quantitative workloads. Compared to the home office, the

coworking space proved to be the preferred work arrangement. Results are discussed with regard to current literature and workplace design. In conclusion, coworking spaces can be seen as an alternative to the home office that was highly valued in the present sample. It is recommended to further emphasize aspects of work environment and ergonomics in order to create health-promoting and satisfying workplaces.

**Robelski et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Coworking space; Home office; New ways of work; Strain; Stress

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132379>

## Guiding and Supporting Mental Health

### *Digital interventions*

#### **Digital games and mindfulness Apps: Comparison of effects on post work recovery.**

**Background:** Engagement in activities that promote the dissipation of work stress is essential for post work recovery and consequently for well-being. Previous research suggests that activities that are immersive, active, and engaging are especially effective at promoting recovery. Therefore, digital games may be able to promote recovery, but little is known about how they compare with other popular mobile activities, such as mindfulness apps that are specifically designed to support well-being. **Objective:** The aim of this study was to investigate and compare the effectiveness of a digital game and mindfulness app in promoting post work recovery, first in a laboratory setting and then in a field study. **Methods:** Study 1 was a laboratory experiment (n=45) in which participants' need for recovery was induced by a work task, before undertaking 1 of 3 interventions: a digital game (Block! Hexa Puzzle), a mindfulness app (Headspace), or a nonmedia control with a fidget spinner (a physical toy). Recovery in the form of how energized participants felt (energetic arousal) was compared before and after the intervention and how recovered participants felt (recovery experience) was compared across the conditions. Study 2 was a field study with working professionals (n=20), for which participants either played the digital game or used the mindfulness app once they arrived home after work for a period of 5 working days. Measures of energetic arousal were taken before and after the intervention, and the recovery experience was measured after the intervention along with measures of enjoyment and job strain. **Results:** A 3x2 mixed analysis of variance identified that, in study 1, the digital game condition increased energetic arousal (indicative of improved recovery) whereas the other 2 conditions decreased energetic arousal ( $F_{2,42}=3.76$ ;  $P=.03$ ). However, there were no differences between the conditions in recovery experience ( $F_{2,42}=.01$ ;  $P=.99$ ). In study 2, multilevel model comparisons identified that neither the intervention nor day of the week had a significant main effect on how energized participants felt. However, for those in the digital game condition, daily recovery experience increased during the course of the study, whereas for those in the mindfulness condition, it decreased ( $F_{1,18}=9.97$ ;  $P=.01$ ). Follow-up interviews with participants identified 3 core themes: detachment and restoration, fluctuations and differences, and routine and scheduling. **Conclusions:** This study suggests that digital games may be effective in promoting post work recovery in laboratory contexts (study 1) and in the real world, although the effect in this case may be cumulative rather than instant (study 2).

**Collins et al. 2019.**

**JMIR Mental Health, vol. 6, no. 7.**

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**Keywords:** Mindfulness; Occupational health; Play; Digital game; Mindfulness application; Post work recovery

**Evidence Level:** 5A

**Link:** <https://mental.imir.org/2019/7/e12853/>

### *Mental health*

#### **Predictors of employment for people with mental illness: Results of a multicenter randomized trial on the effectiveness of placement budgets for supported employment.**

**Background:** Individual placement and support (IPS) has proven to be effective for vocational outcomes in people with mental illness. The original concept of IPS requires temporally unlimited provision of support. Using limited placement budgets and investigating factors that predict their effectiveness may inform decisions about resource allocation. **Methods:** A range of patient characteristics were tested as predictors of employment outcomes in participants who attended six outpatient psychiatric clinics in Switzerland between June 2010 and May 2011. Overall, 116 patients with the full spectrum of psychiatric conditions were randomly assigned and started an IPS intervention, which was provided by three different placement budgets. Support lasted 2 years for those who found a job, and outcomes were repeatedly assessed over 3 years. The intervention ended for those who failed to find competitive employment by the time their placement budget had run out. **Results:** Of the 15 variables tested, only Global Assessment of Functioning (GAF) and Clinical Global Impression (CGI) scores were predictors for obtaining work (for  $\geq 1$  day) and for maintaining it over a longer period ( $>3$  months). Higher GAF and lower CGI scores increased the odds of obtaining employment and keeping it for at least 3 months. Functional role impairment, quality of life, self-esteem, or education level did not predict employment. **Conclusion:** Our data suggest that, if time-restricted budgets are offered to a wide range of patients, such as those included in this study, better functioning and lower symptom severity at baseline are predictive of better employment outcomes (finding and maintaining work) on the first (competitive) labor market in Switzerland. It remains to be investigated whether this holds true under different environmental factors.

**Rossler et al. 2019.**

**Frontiers in Psychiatry, vol. 10, no. 518**

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**Keywords:** Placement budget; Predictors; Prognosis; Serious mental illness; Supported employment; Vocational rehabilitation

**Evidence Level:** 2B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyt.2019.00518/full>

#### **Resilience as a protective factor for depressive mood and anxiety among Korean employees.**

**Background:** This study aimed to investigate resilience as a protective factor for depressive mood and anxiety among Korean employees. **Methods:** Participants were employees of eight private and local government organizations in Korea, aged 19 to 65 years. A self-report questionnaire that included items on resilience, job stress, levels of depression and anxiety, and socio-demographic factors, was administered to 1,079 Korean employees, with 1,076 valid responses. We performed hierarchical linear regression analyses with the levels of depression and anxiety scores as dependent variables. **Results:** Being women and having a high level of job stress were associated with greater depressive mood and anxiety. In contrast, resilience was negatively related to depressive mood and anxiety, after adjusting for demographic variables and the level of job stress. Among the five factors for resilience, "support" and "hardiness" were protective factors for depressive mood and anxiety after adjusting for demographic variables and the level of job stress. **Conclusion:** Based on the results of the current study, we suggest that focusing on the resilience of

employees, especially on "support" and "hardiness," factors as well as developing and engaging in interventions that increase resilience in the workplace, can protect against depressive mood and anxiety, especially for those with high levels of job stress.

**Shin et al. 2019.**

**Journal of Korean Medical Science, vol. 34, no. 27.**

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**Keywords:** Anxiety; Depression; Employee Health; Job Stress; Protective Factor; Psychological Resilience

**Evidence Level:** 4B

**Link:** <https://jkms.org/DOIx.php?id=10.3346/jkms.2019.34.e188>

### **Does cardiorespiratory fitness moderate the association between occupational stress, cardiovascular risk, and mental health in police officers?**

Background: Chronic exposure to occupational stress may lead to negative health consequences. Creating less stressful work environments and making employees physically and psychologically more resilient against stress are therefore two major public health concerns. This study examined whether cardiorespiratory fitness moderated the association between occupational stress, cardiovascular risk, and mental health. Methods: Stress was assessed via the Effort-Reward Imbalance and Job Demand-Control models in 201 police officers (36% women, Mage = 38.6 years). Higher levels of blood pressure, blood lipids, blood sugar, and unfavorable body composition were considered as cardiovascular risk factors. Burnout, insomnia and overall psychological distress were used as mental health indicators. Cardiorespiratory fitness was assessed with a submaximal bicycle test. Results: High cardiorespiratory fitness levels were associated with a reduced cardiometabolic risk, whereas high stress levels were associated with better mental health. Among participants who perceived a high Effort-Reward Imbalance, those with high fitness levels showed lower overall cardiovascular risk scores than their colleagues with low fitness levels. Conclusions: Work health programs for police officers should consider the early screening of burnout, sleep disturbances, and overall mental wellbeing. To increase cardiovascular health, including fitness tests in routine health checks and promoting physical activity to further increase cardiorespiratory fitness appears worthwhile.

**Schilling et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Cardiorespiratory fitness; Cardiovascular health; Mental health; Police officers; Psychosocial stress

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132349>

### **Poor sleep quality and compromised visual working memory capacity.**

These studies explored whether reduced working memory (WM) capacity was related to poor sleep quality and, if the effects of sleep quality could be dissociated from the effects of depressed mood and age on WM. The studies found that poor sleep quality and depressed mood could predict lower WM capacity and that age was associated with reduced WM precision. The authors concluded that these studies showed the effects of sleep, mood, and age on WM but that different aspects of WM (e.g., capacity and precision) are affected.

**Xie et al. 2019.**

**Journal of the International Neuropsychological Society, vol. 25, no. 6.**

**Keywords:** Working memory; Age; Capacity; Depressed mood; Precision; Sleep



**Evidence Level:** 5A

**Link:**

[https://www.cambridge.org/core/product/identifier/S1355617719000183/type/journal\\_article](https://www.cambridge.org/core/product/identifier/S1355617719000183/type/journal_article)

**Are there bidirectional relationships between psychosocial work characteristics and depressive symptoms? A fixed effects analysis of Swedish national panel survey data.**

Objectives: Psychosocial work characteristics have been prospectively associated with depressive symptoms. However, methodological limitations have raised questions regarding causality. It is also unclear to what extent depressive symptoms affect the experience of the psychosocial work environment. We examined contemporaneous (measured simultaneously) and lagged bidirectional relationships between psychosocial work characteristics and depressive symptoms, simultaneously controlling for time-stable individual characteristics. Methods: We included 3947 subjects in the Swedish Longitudinal Occupational Survey of Health (SLOSH), with self-reported job demands, control, social support, work efforts, rewards, procedural justice and depressive symptoms in four waves 2010-2016. We applied dynamic panel models with fixed effects, using structural equation modelling, adjusting for all time-stable individual characteristics such as personality and pre-employment factors. Results: Higher levels of job demands, job demands in relation to control, work efforts and efforts in relation to rewards were contemporaneously associated with more depressive symptoms (standardised  $\beta$ : 0.18-0.25,  $p < 0.001$ ), while higher levels of workplace social support, rewards at work and procedural justice were associated with less depressive symptoms ( $\beta$ : -0.18,  $p < 0.001$ ,  $\beta$ : -0.16,  $p < 0.001$  and  $\beta$ : -0.09,  $p < 0.01$ , respectively). In contrast, only work efforts predicted higher levels of depressive symptoms 2 years later ( $\beta$ : 0.05,  $p < 0.05$ ). No other lagged associations were found in any direction. Conclusions: After controlling for all time-invariant confounding, our results suggest that psychosocial work characteristics predominantly affect depressive symptoms immediately or with only a short time lag. Furthermore, we found no evidence of reverse causation. This indicates short-term causal associations, although the temporal precedence of psychosocial work characteristics remains uncertain.

**Ahlin et al. 2019.**

**Occupational and Environmental Medicine, vol. 76, no. 7.**

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**Keywords:** Depression; Effort-reward imbalance model; Job-demand-control-support model; Longitudinal studies; Organisational justice

**Evidence Level:** 4A

**Link:** <http://oem.bmj.com/cgi/pmidlookup?view=long&pmid=31055470>

*Occupational Stress*

**The influence of working conditions on health satisfaction, physical and mental health: Testing the effort-reward imbalance (ERI) model and its moderation with over-commitment using a representative sample of German employees (GSOEP).**

Background: The effort-reward imbalance (ERI) model is well-established in explaining work-related stress and health differences. A lack of reciprocity between efforts and rewards at the workplace is central to the theory. The third component (over-commitment) was defined to be a moderator of high-cost/low gain-working conditions increasing the risk of ill-health. Although the theory has been widely supported empirically, all underlying hypotheses have not been sufficiently tested. This article examines whether the strength of the effect of the effort-reward imbalance ratio on health indicators is bigger than the effects of efforts and rewards individually.

Another research gap on the interaction with over-commitment is addressed and health measures are compared. Methods: This study applied the effort-reward imbalance model on health satisfaction and the SF-12v2™ indicators physical health composite score (PCS) and mental health composite score (MCS) within a representative sample of German employees. After confirmatory factor analyses of the items of the components effort, reward and over-commitment were applied, multiple linear regression models and interaction effects were calculated for more than 7000 respondents within the German Socio-Economic Panel (GSOEP) study. Results: Against the model's hypothesis, effort and especially reward had a stronger effect on health satisfaction and mental health individually than the effort-reward imbalance ratio. Over-commitment exerted a negative influence on health indicators and its interaction with the effort-reward imbalance ratio intensified this effect significantly for mental health. Overall, the best model fit was reached for mental health, which is in line with the model's stress theory foundation. Conclusions: Although the ERI model has been applied for more than 20 years, theoretical and methodological demands can no longer be neglected. This article contributes to the revision of the effort-reward imbalance (ERI) model and demonstrates possible starting points for prevention programs focusing on rewards.

**Kunz et al. 2019.**

**BMC Public Health, vol. 19, no. 1.**

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**Keywords:** Working conditions; Effort-reward imbalance; Health satisfaction; Interaction effects; Moderation; Work stress model

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7187-1>

### **Perceived organisational politics, engagement, and stress: The mediating influence of meaningful work.**

The research aimed to assess proposed associations between organisational politics and employee engagement, employee stress (or more correctly 'strain'), and work meaningfulness. Very few studies have examined these associations. Confirmatory factor analyses established the dimensionality and reliability of the full measurement model across two independent samples (N = 303, N = 373). Structural equation modeling supported the proposed direct associations between organisational politics, operationalized as a higher order construct, and employee stress and employee engagement. These relationships were shown to be partially mediated by meaningful work. As such, politics had significant indirect effects on engagement and stress through meaningful work. The results also showed a significant and direct association between stress and engagement. Overall, the results shed important new light on the factors that influence engagement, and identify work meaningfulness as an important psychological mechanism that can help explain the adverse impact of organisational politics on employee engagement and stress. The results also support the dimensionality and validity of a new set of measures of perceived organisational politics focused on generalized perceptions about the use and abuse of relationships, resources, reputation, decisions, and communication channels. More generally, the results serve as a platform for further research regarding the negative influence of organisational politics on a range of individual and organisational outcomes.

**Landells et al. 2019.**

**Frontiers in Psychology, vol. 10.**

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**Keywords:** Meaningful work; Measures; Organisational politics; Stress; Work engagement

**Evidence Level:** 5A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01612/full>

### **Stress levels escalate when repeatedly performing tasks involving threats.**

Police work may include performing repeated tasks under the influence of psychological stress, which can affect perceptual, cognitive and motor performance. However, it is largely unknown how repeatedly performing stressful tasks physically affect police officers in terms of heart rate and pupil diameter properties. Psychological stress is commonly assessed by monitoring the changes in these biomarkers. Heart rate and pupil diameter was measured in 12 male police officers when performing a sequence of four stressful tasks, each lasting between 20 and 130 s. The participants were first placed in a dimly illuminated anteroom before allowed to enter a brightly lit room where a scenario was played out. After each task was performed, the participants returned to the anteroom for about 30 s before performing the next sequential task. Performing a repeated sequence of stressful tasks caused a significant increase in heart rate ( $p = 0.005$ ). The heart rate started to increase already before entering the scenario room and was significantly larger just after starting the task than just before starting the task ( $p < 0.001$ ). This pattern was more marked during the first tasks ( $p < 0.001$ ). Issuance of a verbal "abort" command which terminated the tasks led to a significant increase of heart rate ( $p = 0.002$ ), especially when performing the first tasks ( $p = 0.002$ ). The pupil diameter changed significantly during the repeated tasks during all phases but in a complex pattern where the pupil diameter reached a minimum during task 2 followed by an increase during tasks 3 and 4 ( $p \leq 0.020$ ). During the initial tasks, the pupil size ( $p = 0.014$ ) increased significantly. The results suggest that being repeatedly exposed to stressful tasks can produce in itself an escalation of psychological stress, this even prior to being exposed to the task. However, the characteristics of both the heart rate and pupil diameter were complex, thus, the findings highlight the importance of studying the effects and dynamics of different stress-generating factors. Monitoring heart rate was found useful to screen for stress responses, and thus, to be a vehicle for indication if and when rotation of deployed personnel is necessary to avoid sustained high stress exposures.

**Bertilsson et al. 2019.**

**Frontiers in Psychology, vol. 10.**

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**Keywords:** Heart rate; Operative police tactics; Pupil dilation; Repetition; Stress escalation

**Evidence Level:** 5A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01562/full>

### **Psychosocial work factors, job stress and strain at the wheel: Validation of the Copenhagen Psychosocial Questionnaire (COPSOQ) in professional drivers.**

**Introduction:** Psychosocial work environment has been related to many negative health outcomes in different workforces. However, evidence in this regard is still limited in the case of transport workers, and most of the tools used in research, often excessively generic, do not fully consider the specific key stressors, and adverse issues present in the psychosocial environment of professional driving. **Objective:** Thus, the purpose of this study was to obtain a complete description of the validation of measurement applied to psychosocial factors at work in professional drivers, using the Enterprise version (2018) of COPSOQ-III. **Methods:** The data was collected from 726 Spanish professional drivers, and the analyses were conducted using the competitive Confirmatory Factor Analysis or CFA, obtaining basic psychometric properties and an optimized structure for the instrument applied to active transport workers. **Results:** The results suggest a clear factorial structure, high factorial weights, internal consistency, and an improved adjustment to the psychosocial conditions of this group, excluding a set of items with low psychometrical adjustment and keeping the five-factor structure of the questionnaire: demands, influence and development, interpersonal relationships and leadership, job insecurity, and strain-

effects and outcomes. Conclusion: Overall, what was found in this study supports the hypothesis that the validated version of COPSOQ in professional drivers, together with complementary information sources specific for their work environment, may have a relevant research value and some important practical implications for the improvement of the occupational safety, and health within the typically vulnerable industry of transportation.

**Useche et al. 2019.**

**Frontiers in Psychology, vol. 10.**

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**Keywords:** COPSOQ; job stress; professional drivers; psychosocial work factors; transport workers; work environment

**Evidence Level:** 5B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01531/full>

### **Human error: The impact of job insecurity on attention-related cognitive errors and error detection.**

Background: Work-related stress is a major contributor to human error. One significant workplace stressor is job insecurity, which has been linked to an increased likelihood of experiencing burnout. This, in turn, might affect human error, specifically attention-related cognitive errors (ARCES) and the ability to detect errors. ARCES can be costly for organizations and pose a safety risk. Equally detrimental effects can be caused by failure to detect errors before they can cause harm. Methods: We gathered self-report and behavioral data from 148 employees working in educational, financial and medical sectors in China. We designed and piloted an error detection task in which employees had to compare fictitious customer orders to deliveries of an online shop. We tested for indirect effects using the PROCESS macro with bootstrapping. Results: Our findings confirmed indirect effects of job insecurity on both ARCES and the ability to detect errors via burnout. Conclusions: The present research shows that job insecurity influences making and detecting errors through its relationship with burnout. These findings suggest that job insecurity could increase the likelihood for human error with potential implications for employees' safety and the safety of others.

**Roll et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Behavioral data; Burnout; Cognitive errors; Error detection; Qualitative job insecurity; Quantitative job insecurity

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132427>

### **The severity of work-related stress and an assessment of the areas of work life in the service sector.**

Objectives: The aim of the study was to examine the potential differences in the assessment of the severity of work-related stress, and in the global assessment of the areas of worklife and individual worklife dimensions in employees working in service occupations. Methods: The research covered 61 emergency workers, 92 helping professionals, and 58 knowledge workers. A subjective assessment of the areas of worklife was carried out using the Areas of Worklife Survey, and the Perceived Stress Scale (PSS-10) was used to investigate stress severity. Results: The research has revealed statistically significant differences between workers belonging to the 3 groups of service occupations in their assessment of the severity of work-related stress. The findings have shown that 26% of the variance of the Stress Severity Assessment variable is explained by belonging to a specific occupational group. Police officers and helping professionals experience comparably

severe stress, which is significantly stronger than that experienced by the laboratory staff. Statistically significant differences have also been found between the studied groups in terms of the global assessment of all areas of worklife, as well as in the assessment of particular areas, i.e., control, rewards, fairness and values. No significant differences have been found with regard to the workload and community areas. Conclusions: Working in social service occupations, whether as emergency or helping professionals, may lead to a similar level of stress severity. The surveyed workers do not differ in their assessment of workload or of the sense of trust, cooperation and support received from their co-workers. Further research should be carried out to explore the sources of stress, which may be linked to other factors than the areas of worklife presented here, such as stress inducing contact with customers, environmental determinants of work, existing hazards to life or health, or the intrinsic predispositions of individuals performing specific types of work and gender

**Chudzicka-Czupala et al. 2019.**

**International Journal of Occupational Medicine and Environmental Health, vol. 32, no. 4.**

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**Keywords:** Emergency professions; Job stress; Knowledge-based professions; Service professions; Social professions; Worklife areas

**Evidence Level:** 4B

**Link:** <http://ijomeh.eu/Work-related-stress-severity-and-assessment-of-areas-of-worklife-in-the-service-sector,109207,0,2.html>

### *Burnout*

**Exploring intergenerational differences in burnout and how they relate to work engagement, norms, and values: A mixed-methods study.**

Background: Burnout has been on the rise in recent years. Is this increasing prevalence due to changing working circumstances, or also to a changing societal context? Aim: The aim of the study was to explore intergenerational differences in burnout. Design & Setting: The study used a mixed quantitative and qualitative design, and tested the theory of the job demands-resources model (JD-RM). The target group of this research was the working population in Belgium, aged between 21-65 years. The study was performed in a public setting with people recruited through social media. Method: A quantitative web survey was distributed among the participants to explore the prevalence of burnout, work ethic, work engagement, and norms and values. The second part of the study used a focus group technique to explore in depth the eight statements that were formulated from the quantitative survey. Results: A total of 309 people participated in the web survey and 21.5% met the criteria for 'burnout', while 22.6% scored high on the criteria for 'engagement'. It was found that 12.6% of all men and 3.0% of all women could not identify with the portrait of 'equivalence'. The value 'benevolence' was positively rated by 100%. In the youngest generation, 71.3 % identified with the portrait of 'stimulation', while 70.8% of older men identified with the portrait 'traditions'. The results also revealed that 43.1% of the younger generation agreed with the statement: 'I often think I would be more successful if I gave up certain pleasures' Conclusion: Burnout is more common among young people. In the older generation, a good ability to put things into perspective, a good balance between work and leisure, and a strong sense of tradition appear to be resources to aid against burnout. The younger generation often deals with stressors. This younger generation appears to have a higher work ethic and commitment.

**De Maeyer et al. 2019.**

**BJGP Open, vol. 3, no. 2.**

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**Keywords:** Burnout; Ethics; General practice; Generations; Primary care

**Evidence Level:** 4B

**Link:** <https://bigpopen.org/content/3/2/bigpopen18X101637>

### **Role stress, job burnout, and job performance in construction project managers: The moderating role of career calling.**

This study aims to explore the influence of role stress (role ambiguity and role conflict) on job burnout and job performance in construction project managers in the Chinese construction industry. Based on the JD-R (Job Demands Resources) model, this study introduces career calling as the moderating variable, in order to develop a theoretical model. The theoretical model is then tested with structural equation modeling. This work uses data from 191 owners, contractors, subcontractors, and supervisors in the Chinese construction industry. The results indicate that: (i) role ambiguity has a negative and significant effect on job burnout and job performance; (ii) role conflict has a negative effect on job burnout, but has a non-significant influence on job performance; (iii) job burnout has a negative impact on job performance; (iv) career calling negatively moderates the relationship between role ambiguity and job burnout, and positively moderates the relationship between role conflict and job performance. Furthermore, the results also show that career calling can positively moderate the effect of role conflict on job burnout. This study expands the existing body of knowledge by reasonably controlling role stress and appropriately introducing career calling. In addition, the study provides some suggestions relevant to construction project management.

**Wu et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Career calling; Job burnout; Job performance; Role stress

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/16/13/2394>

### **The interaction effects of burnout and job support on peptic ulcer disease (PUD) among firefighters and policemen.**

Policemen and firefighters encounter numerous emergency events that frequently lead to high burnout and low job support, resulting in adverse health effects. A number of studies reported the correlation between job characteristics and the risk of peptic ulcer diseases (PUD) across various industries. However, there is very little research on evaluating the interaction effects of burnout and job support on the prevalence of PUD among firefighters and policemen. The objective of this study was to assess the interactional effects between burnout and job support on the prevalence of PUD among firefighters and policemen. This was a cross-sectional quantitative study.

Registered, full-time police officers and firefighters in Taiwan were anonymously interviewed by a mail-delivered questionnaire. All female workers were excluded due to different job characteristics and a limited sample size. A total of 9328 firefighters and 42,798 policemen completed the questionnaire, with a response rate of 78.7%. Overall, prevalence rates of self-reported and self-reports of physician-diagnosed PUD were 8.3% and 6.5% for policemen and 7.1% and 5.5% for firefighters, respectively. There was a 22% reduced odds ratio of PUD as diagnosed by physicians for the group with low burnout and high job support, but an increased odds ratio of 53% for the group with high burnout and low job support, after adjusting for lifestyle and demographic variables. There must be an increase of job support and reduction of burnout through the modification of work structure and setting up of counseling services to reduce workplace stress and the prevalence of PUD among policemen and firefighters.

**Lin et al. 2019.**



**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Burnout; Firefighters; Job support; Peptic ulcer diseases (PUD); Policemen

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132369>

**Link:** <https://www.medscimonit.com/download/index/idArt/914205>

## Enabling Healthy and Safe Workplaces

### *Sedentary work*

#### **How to measure sedentary behavior at work?**

Background: Prolonged sedentary behavior (SB) is associated with increased risk for chronic conditions. A growing number of the workforce is employed in office setting with high occupational exposure to SB. There is a new focus in assessing, understanding and reducing SB in the workplace. There are many subjective (questionnaires) and objective methods (monitoring with wearable devices) available to determine SB. Therefore, we aimed to provide a global understanding on methods currently used for SB assessment at work. Methods: We carried out a systematic review on methods to measure SB at work. Pubmed, Cochrane, Embase, and Web of Science were searched for peer-reviewed English-language articles published between 1st January 2000 and 17th March 2019. Results: We included 154 articles: 89 were cross-sectional and 65 were longitudinal studies, for a total of 474,091 participants. SB was assessed by self-reported questionnaires in 91 studies, by wearables devices in also 91 studies, and simultaneously by a questionnaire and wearables devices in 30 studies. Among the 91 studies using wearable devices, 73 studies used only one device, 15 studies used several devices, and three studies used complex physiological systems. Studies exploring SB on a large sample used significantly more only questionnaires and/or one wearable device. Conclusions: Available questionnaires are the most accessible method for studies on large population with a limited budget. For smaller groups, SB at work can be objectively measured with wearable devices (accelerometers, heart-rate monitors, pressure meters, goniometers, electromyography meters, gas-meters) and the results can be associated and compared with a subjective measure (questionnaire). The number of devices worn can increase the accuracy but make the analysis more complex and time consuming.

**Boudet et al. 2019.**

**Frontiers in Public Health, vol. 7.**

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**Keywords:** Occupational health; Questionnaires; Recommendations; Sedentary behavior measurement; Sedentary lifestyle; Wearable devices; Work; Workplace

**Evidence Level:** 1A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2019.00167/full>

### *Risk Assessment*

#### **Cardiac MRI improves cardiovascular risk stratification in hazardous occupations.**

Background: The benefit of cardiovascular magnetic resonance Imaging (CMR) in assessing occupational risk is unknown. Pilots undergo frequent medical assessment for occult disease, which threatens incapacitation or distraction during flight. ECG and examination anomalies often lead to lengthy restriction, pending full investigation. CMR provides a sensitive, specific assessment of cardiac anatomy, tissue characterisation, perfusion defects and myocardial viability. We sought to determine if CMR, when added to standard care, would alter occupational outcome. Methods: A retrospective review was conducted of all personnel attending the RAF Aviation

Medicine Consultation Service (AMCS) for assessment of a cardiac anomaly, over a 2-year period. Those undergoing standard of care (history, examination, exercise ECG, 24 h-Holter and transthoracic echocardiography), and those undergoing a CMR in addition, were identified. The influence of CMR upon the final decision regarding flying restriction was determined by comparing the diagnosis reached with standard of care plus CMR vs. standard of care alone. Results: Of the ~ 8000 UK military aircrew, 558 personnel were seen for cardiovascular assessment. Fifty-two underwent CMR. A normal TTE did not reliably exclude abnormalities subsequently detected by CMR. Addition of CMR resulted in an upgraded occupational status in 62% of those investigated, with 37% returning to unrestricted duties. Only 8% of referrals were undiagnosed following CMR. All these were cases of borderline chamber dilatation and reduction in systolic function in whom diagnostic uncertainty remained between physiological exercise adaptation and early cardiomyopathy. Conclusions: CMR increases the likelihood of a definitive diagnosis and of return to flying. This study supports early use of CMR in occupational assessment for high-hazard occupations.

**Holdsworth et al. 2019.**

**Journal of Cardiovascular Magnetic Resonance, vol. 21, no. 1.**

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**Keywords:** Aviation medicine; Cardiomyopathy; Ectopy; Occupational; Risk

**Evidence Level:** 4A

**Link:** <https://jcmr-online.biomedcentral.com/articles/10.1186/s12968-019-0544-5>

**Psychosocial risk prevention in a global occupational health perspective. A descriptive analysis.**

This study aimed to find out which countries around the world require psychosocial hazards and workplace violence to be assessed by employers through a mandatory occupational risk assessment process and to compare the type of legislation between countries. We systematically searched the International Labour Office (ILO) "LEGOSH" database for documents published during the period between December 2017 and February 2018. The search included 132 countries, of which 23 were considered as developed and 109 as developing according to the United Nations. Our review showed that most countries (85, i.e., 64%) have not included mandatory psychosocial risk assessment and prevention in their national occupational safety and health legislation. Moreover, we found differences between developed and developing countries, showing that developed countries more frequently have legislative measures. Within developed countries, we also found differences between countries following the Scandinavian model of workplace health and safety culture and other countries. Moreover, in many countries, workplace violence was prohibited only if it involves an offence to moral or religious customs. In conclusion, the marked difference in psychosocial hazards and workplace violence regulations among countries leads to unequal levels of workers' protection, with adverse effects on global health.

**Chirico et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 14.**

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**Keywords:** Global health; Health inequalities; Job strain; Legislation; Mental health; Occupational health; Psychosocial hazard; Public health policy; Workplace violence

**Evidence Level:** 6A

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16142470>

## *Wellbeing*

### **Health support for a remote industrial site.**

This publication is derived from and rooted in the authors' experience in designing the Health Support of a remote industrial site. Summarizing the main steps of this design is the purpose of the approach. As a first step devoted to "Evaluation" (Chapters 1-5) are displayed the fundamentals for designing a Project Health Plan, such as a realistic and operative definition of "patient stabilization" and the principles of tactical reasoning for Medevacs, specifying how pathophysiology and logistic constraints should be correlated. A core element of the conceptual work consists in partnering these two domains, which usually each go their own way. Both should be considered in terms of delays: in life threatening situations, pathophysiology allows for a (maximum) delay before effective stabilization, while logistics dictates a (minimum) delay for reaching a stabilization facility. Ensuring that these two delays match is the desired result. Clearly, this conceptual work will unfold its full potential in low sanitary level countries, where most industrial commodities Projects take place, and where these delays are the longest. Next is detailed the audit/study preparation, i.e., the data gathering needed to get a clear picture of the Project conditions and concerns, workforce headcount and pattern, evacuation vectors and delays, and reference documents. Finally, risk assessment and a review of health facilities-in the vicinity and further away-complete the evaluation work. In a second phase devoted to "Implementation" (Chapters 6-9) is detailed how contracts with health providers, and health exhibits of industrial contracts should be conceived, and how on-site health support is designed, from the necessity of a pre-employment check to the design and organization of routine and emergency medicine facilities. Emergency preparedness and response plans, as well as medical coordination, should integrate with the HSE command chart. Overall, this document strongly advocates for joint engineering between HSE officers and medical specialists. An overview of key points for hygiene-often a separate topic covered in an offprint-is proposed. Finally, forward guidance for writing the audit/study report is proposed. This audit/study report must result in conclusive recommendations. Hence, a guide is proposed so that the report becomes a matrix of the Health Plan itself, and will be ended by a summary of findings and recommendations ready-to-use in Project management. In this way, the Health Plan will be launched, and gradually evolve and be amended as a "living document" throughout the lifetime of the Project.

**Lentz et al. 2019.**

**Frontiers in Public Health, vol. 7, no. 180.**

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**Keywords:** Health Plan; Emergency preparedness; Medical engineering; Occupational health; Remote industrial site

**Evidence Level:** 6B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2019.00180/full>

### **Health-related consequences of work-family conflict from a European perspective: Results of a scoping review.**

Background: Rising percentages of working mothers and increasing numbers of dual-earner couples are putting work-family conflicts on the agenda. Studies based on data from the US have already proven a link between work-family conflict and health in working parents with heterogeneous results for certain health outcomes and subgroups. Also, to date no comprehensive overview of the existing evidence regarding the impact of work-family conflict on health among European working parents exist. Methods: A scoping review was conducted to identify and analyze knowledge gaps regarding health-related consequences of work-family conflicts. To search for relevant publications on work-family conflicts and health, a systematic prospective literature search was carried out in two international databases (PubMed and Scopus)

based on four landmark publications. The search was complemented by a systematic retrospective search in Scopus and hand searches. Inclusion criteria were a focus on work-family conflict, an analysis of health-related outcomes, and the presentation of empirical results. The publications were summarized in narrative style. Results: A total of n = 25 publications on work-family conflict and health in Europe were identified. The data suggests that a variety of instruments is used to measure work-family conflict. Also, work-family conflict and health are linked in Europe, although longitudinal data do not always show robust causal interrelations. Most studies focus on self-rated, mental, and physical health. Results for gender-specific health outcomes remain controversial. Conclusion: The review provides an overview of existing evidence for health-related consequences of work-family conflicts in Europe. The results of the review strengthen the evidence for a link between work-family conflict and health. However, heterogeneous results regarding the direction of work-family conflict and high-risk groups are a matter for discussion. This study investigates whether differences in the results can be accounted for by diverse measurement methods and study populations. Furthermore, different family policies in the European region as well as intersectional approaches should be taken into account in further research.

**Borgmann et al. 2019.**

**Frontiers of Public Health, vol. 7.**

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**Keywords:** Family-to-work conflict; Mental health; Physical health; Scoping review; Self-rated health; Work-to-family conflict

**Evidence Level:** 6A

**Link:** <https://dx.doi.org/10.3389/fpubh.2019.00189>

### **Health behaviors as a mediator of the association between interpersonal relationships and physical health in a workplace context.**

The etiology of diseases is multifactorial, involving genetic, environmental, and lifestyle-related behaviors. Considering the pathway that involves behavioral processes, a huge body of empirical evidence has shown that some healthy behaviors such as non-smoking, any or moderate alcohol consumption, a healthy diet, (e.g., fruit and vegetable intake), and physical activity, decrease the risk of disease and mortality. This study aimed to explore the potential mediating effect of combined health behaviors on the association between interpersonal relationships and physical health in a Brazilian adult worker population from the Occupational Health Service within the oil industry in Bahia, Brazil. The sample included 611 workers, of which 567 (92.8%) were males and 44 (7.2%) females, age ranging from 18 to 73 years (M = 41.95; SD = 8.88). The significant predictors of physical health were interpersonal relationships and health behaviors. Health behaviors contributed significantly to a reduction in the effect of interpersonal relationships on physical health outcomes. As far as it is known, there has been no prior work in Brazil that simultaneously examined the best predictors of physical health in oil workers using this conceptual model. Interventions in the workplace environment need to consider health behavior as a mediator between interpersonal relationships and physical health, aligned in a global psychosocial approach to health at work.

**Dinis et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Health behaviors; Interpersonal relationships; Mediator; Physical health; Predictor

**Evidence Level:** 4B

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132392>

### **Patterns of diet, physical activity, sitting and sleep are associated with socio-demographic, behavioural, and health-risk indicators in adults.**

Our understanding of how multiple health-behaviours co-occur is in its infancy. This study aimed to: (1) identify patterns of physical activity, diet, sitting, and sleep; and (2) examine the association between sociodemographic and health-risk indicators. Pooled data from annual cross-sectional telephone surveys of Australian adults (2015-2017, n = 3374, 51.4% women) were used.

Participants self-reported physical activity, diet, sitting-time, sleep/rest insufficiency, sociodemographic characteristics, smoking, alcohol use, height and weight to calculate body mass index (BMI), and mental distress frequency. Latent class analysis identified health-behaviour classes. Latent class regression determined the associations between health-behaviour patterns, sociodemographic, and health-risk indicators. Three latent classes were identified. Relative to a 'moderate lifestyle' pattern (men: 43.2%, women: 38.1%), a 'poor lifestyle' pattern (men: 19.9%, women: 30.5%) was associated with increased odds of a younger age, smoking, BMI  $\geq$  30.0 kg/m<sup>2</sup>, frequent mental distress (men and women), non-partnered status (men only), a lower Socioeconomic Index for Areas centile, primary/secondary education only, and BMI = 25.0-29.9 kg/m<sup>2</sup> (women only). An 'active poor sleeper' pattern (men: 37.0%, women: 31.4%) was associated with increased odds of a younger age (men and women), working and frequent mental distress (women only), relative to a 'moderate lifestyle' pattern. Better understanding of how health-behaviour patterns influence future health status is needed. Targeted interventions jointly addressing these behaviours are a public health priority.

**Oftedal et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 13.**

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**Keywords:** Body mass index; Health behaviour; Lifestyle; Mental health

**Evidence Level:** 4A

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16132375>

### *Physical activity*

#### **Motivation profiles for physical activity among office workers.**

Physical activity is of importance for health enhancement. To promote physical activity involvement, motivation is considered to be a key factor. This study aimed to examine the motivation profiles for physical activity in a sample of Chinese office-based workers, grounded in a person-centered approach. Latent profile analysis was performed to generate motivation profiles for physical activity behavior. Successively, profile differences in relation to different motivations and physical activity were explored. Two motivation profiles emerged from the analysis. The two profiles differed significantly in various behavioral motivations and physical activity. The findings indicate that motivation profile characterized by autonomous motivation and introjected regulation is more favorable in physical activity participation, compared with a profile featuring external regulation and amotivation. The motivation profiles that naturally emerge are informative for future intervention design aiming to facilitate physical activity participation.

**Zhong et al. 2019.**

**Frontiers in Psychology, vol. 10.**

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**Keywords:** Latent profile analysis; Motivation; Person-centered approach; Physical activity; Self-determination theory

**Evidence Level:** 5B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01577/full>



### *Occupational exposure*

#### **Assessment of thermal exposure level among construction workers in the United Arab Emirates using Wet Bulb Globe Temperature index, Heat Stress index and Thermal Work Limit indices.**

The study aimed to assess the heat stress of the construction workers in the United Arab Emirates (UAE), using Wet Bulb Globe temperature (WBGT) index, whereas also computing Heat stress index (HSI), and Thermal Work Limit (TWL) for comparison. Portable Area Heat Stress Monitor (HS-32) was used for measuring WBGT<sub>outdoor</sub>, Dry Bulb Temperature, Natural Wet Bulb Temperature, Globe Temperature in °C, and Relative humidity. The outcomes demonstrated that the WBGT exceeded the recommended Threshold Limit Value (TLV) and that workers are at risk of heat stress. According to HSI, only fit acclimatized young workers can tolerate work in this site, and workers should be selected by medical examination. As per TWL, the site was labeled as Acclimatization Zone implying that no un-acclimatized worker should work here and working alone should be avoided. The construction workers lie at a high or medium risk of heat stress. The contribution of the radiant heat load was very high compared with metabolic load and convective load. Furthermore, WBGT, HSI, and TWL are suitable to assess thermal stress in construction environments. Scheduling of the work earlier or later (after sunset) along with breaks for rest on cool shaded areas are recommended.

**Ahmed et al. 2019.**

#### **Industrial Health.**

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**Keywords:** Construction workers; Heat stress; Heat stress index; Thermal work limit; Wet bulb globe temperature index

**Evidence Level:** 5B

**Link:** [https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub\\_2018-0259/article](https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub_2018-0259/article)

#### **Repeated exposure to high ICT demands at work, and development of suboptimal self-rated health: findings from a 4-year follow-up of the SLOSH study.**

**Purpose:** The knowledge about the association between Information and Communication Technology (ICT) demands at work and self-rated health (SRH) is insufficient. The aim of this study was to examine the association between repeated exposure to high ICT demands at work, and risk of suboptimal SRH, and to determine modifications by sex or socioeconomic position (SEP).

**Methods:** A prospective design was used, including repeated measurement of ICT demands at work, measured 2 years apart. SRH was measured at baseline and at follow-up after 4 years. The data were derived from the Swedish Longitudinal Occupational Survey of Health (SLOSH), including 4468 gainfully employees (1941 men, 2527 women) with good SRH at baseline. **Results:** In the total study sample, repeated exposure to high ICT demands at work was associated with suboptimal SRH at follow-up (OR 1.34 [CI 1.06-1.70]), adjusted for age, sex, SEP, health behaviours, BMI, job strain and social support. An interaction between ICT demands and sex was observed ( $p = 0.010$ ). The risk was only present in men (OR 1.53 [CI 1.09-2.16]), and not in women (OR 1.17 [CI 0.85-1.62]). The risk of suboptimal SRH after consistently high ICT demands at work was most elevated in participants with high SEP (OR 1.68 [CI 1.02-2.79]), adjusted for age, sex, health behaviours, BMI and job strain. However, no significant interaction between ICT demands and SEP regarding SRH was observed. **Conclusions:** Repeated exposure to high ICT demands at work was associated with suboptimal SRH at follow-up, and the association was modified by sex.

**Stadin et al. 2019.**

#### **International Archives of Occupational and Environmental Health, vol. 92, no. 5.**

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**Keywords:** Gender differences; ICT demands at work; Occupational health; Self-rated health; Socioeconomic position; Work-related stress

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007%2Fs00420-019-01407-6>

### **Occupational Exposure to Solvents and Lung Function Decline: A Population Based Study**

This study explored the longitudinal relationship between occupational exposures and longitudinal lung function decline in a Tasmanian population. The study found that compared with those who never had an exposure, ever exposures to aromatic solvents and metals were associated with a greater decline in FEV1 and FVC, with cumulative exposure (unit years) to aromatic solvents associated with greater decline in FEV1 and FVC. Women had lower cumulative exposure years to aromatic solvents than men but greater lung function decline than men. The authors concluded that exposures to aromatic solvents and metals were associated with greater decline in lung function, with the effect of aromatic solvents higher in women.

**Alif et al. 2019.**

**Thorax, vol. 74, no. 7.**

**Keywords:** FEV1; Chronic obstructive pulmonary disease; Job exposure matrix; Lung function; Occupational exposure; Solvents

**Evidence Level:** 4A

**Link:** <http://thorax.bmj.com/cgi/pmidlookup?view=long&pmid=31028237>

### **Health risk in transport workers. Part II. Dietary compounds as modulators of occupational exposure to chemicals.**

Professional drivers are exposed to a number of factors that have a negative influence on their health status. These include vibrations, noise, the lack of fresh air in the car cabin, shift work (frequently at night), monotony resulting from permanent repetition of certain actions, static loads due to immobilization in a sitting position, stress resulting from the need to ensure safety in heavy traffic, as well as air pollution (dust, volatile organic substances, nitrogen and sulfur oxides, polycyclic aromatic hydrocarbons, heavy metals, dioxins, furans and others). Factors associated with the specificity of the profession of a driver, including exposure to chemical substances, result in an increased risk of the development of many diseases, i.e., obesity, diabetes, heart disease, hypertension, extensive genitourinary pathology experienced by taxi drivers, lung cancer and other forms of cancer. In the case of drivers, especially those covering long distances, there are also actual difficulties related to ensuring a proper diet. Although attempts at interventional research that would change the principles of nutrition, as well as ensure physical activity and weight reduction, have been made, their results have not been satisfactory. The paper focuses on the discussion on the role of a diet and dietary phytochemicals in the prevention of adverse health effects of such chemicals as a mix of chemicals in the polluted air, benzo(a)pyrene, benzene and metals (lead, cadmium, chromium, nickel), which are the main sources of exposure in the case of transport workers.

**Kozłowska et al. 2019.**

**International Journal of Occupational Medicine and Environmental health, vol. 32, no. 4.**

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**Keywords:** Enzene; Benzo(a)pyrene; Diet; Dietary supplements; Heavy metals; Transport workers

**Evidence Level:** 6B

**Link:** <http://ijomeh.eu/Health-risk-in-transport-workers-Part-II-Dietary-compounds-as-modulators-of-occupational,105520,0,2.html>

## **Occupational health outcomes among international migrant workers: a systematic review and meta-analysis.**

Background: Globally, there are more than 150 million international migrant workers-individuals who are employed outside of their country of origin-comprising the largest international migrant group. A substantial number of migrants work in hazardous and exploitative environments, where they might be at considerable risk of injury and ill health. However, little data on occupational health outcomes of migrant workers exist, with which to inform global policy making and delivery of health services. Methods: For this systematic review and meta-analysis, we searched Embase, MEDLINE, Ovid Global Health, and PsychINFO databases for primary research published between Jan 1, 2008, and Jan 24, 2018, reporting occupational health outcomes among international migrant workers (defined as individuals who are or have been employed outside their country of origin), without language or geographical restrictions. We excluded studies containing mixed cohorts of migrants and native workers in which migrant data could not be disaggregated, and studies that did not explicitly report migrant status. The main outcome was prevalence of occupational health outcomes (defined as any injury, mortality, or physical or psychiatric morbidity due to an individual's work or workplace environment) among international migrant workers. Summary estimates were calculated using random-effects models. The study protocol has been registered with PROSPERO, number CRD42018099465. Findings: Of the 1218 studies identified by our search, 36 studies were included in our systematic review, and 18 studies were included in the meta-analysis. The systematic review included occupational health outcomes for 12 168 international migrant workers employed in 13 countries and territories, mostly employed in unskilled manual labour. Migrant workers originated from 25 low-income and middle-income countries, and worked in the following sectors: agriculture; domestic, retail, and service sectors; construction and trade; and manufacturing and processing. Migrant workers had various psychiatric and physical morbidities, and workplace accidents and injuries were relatively common. In the meta-analysis, among 7260 international migrant workers, the pooled prevalence of having at least one occupational morbidity was 47% (95% CI 29-64; I<sup>2</sup>=99.70%). Among 3890 migrant workers, the prevalence of having at least one injury or accident, including falls from heights, fractures and dislocations, ocular injuries, and cuts was 22% (7-37; I<sup>2</sup>=99.35%). Interpretation: International migrant workers are at considerable risk of work-related ill health and injury, and their health needs are critically overlooked in research and policy. Governments, policy makers, and businesses must enforce and improve occupational health and safety measures, which should be accompanied by accessible, affordable, and appropriate health care and insurance coverage to meet the care needs of this important working population.

**Hargreaves et al. 2019.**

**The Lancet Global Health, vol. 7, no. 7.**

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**Keywords:** Occupational health; Migrants; Hazardous environment; Exploitative environments; Work related health

**Evidence Level:** 1A

**Link:** <http://www.thelancet.com/retrieve/pii/S2214109X19302049>

### *Musculoskeletal Health*

#### **Workplace-based exercise intervention improves work ability in office workers: A cluster randomised controlled trial.**

Neck pain is a burden to employers and employees amenable to improvement with neck/shoulder strengthening exercises. However, the benefits of such interventions on office workers' work ability remains unknown. This study evaluated the effects of a 12-week combined ergonomics and

neck/shoulder strengthening exercise intervention (EET, n = 177, mean age 41.7 years, 26% female), versus a 12-week combined ergonomics and health promotion intervention (EHP, n = 173, mean age 43 years, 29% female) on work ability among office workers. Work ability was measured by a single question. Differences in the work ability score were analyzed using the intention-to-treat (ITT) and per-protocol (i.e., adherence  $\geq 70\%$ ) analyses for between- and within-group differences at baseline, 12 weeks, and 12 months. A sub-group analysis was performed for neck cases, defined as reporting neck pain as  $\geq 3$  (out of 10). No significant between-group differences for work ability were observed in the general population, and subgroup of neck cases. A significant group-by-time interaction effect at 12 weeks and the trend for significance at 12 months favored the EET group in the per-protocol analysis of the neck cases. EET was effective in increasing work ability post-intervention and potentially, in the long-term, in symptomatic participants with  $\geq 70\%$  adherence to the intervention. However, EET was not superior to EHP.

**Ting et al. 2019.**

**International Journal of Environmental Research and Public Health, vol. 16, no. 15.**

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**Keywords:** Neck pain 2; Neck/shoulder strengthening exercises; Office workers; Work ability

**Evidence Level:** 2A

**Link:** <http://www.mdpi.com/resolver?pii=ijerph16152633>

#### **Comparative effect of driving side on low back pain due to repetitive ipsilateral rotation.**

This study explored the effects of repetitive rotation on low back pain among 1200 male taxi drivers, aged between 20-60 years. The study found that point, one week, one year and lifetime prevalence of LBP among right hand drive taxi drivers was 26.7%, 35.5%, 49.8% and 77.7% and left-hand drive taxi drivers was 37%, 42.7%, 53.5% and 72.3% respectively. The authors concluded that lack of exercise, increased number of years working as a taxi driver and hours driving in a day, driving within city, lifting, and lower satisfaction level of job were related to LBP.

**Arslan et al. 2019.**

**Pakistan Journal of Medical Sciences, vol. 35, no. 4**

**Keywords:** Lower back pain; Occupational health; Prevalence; Risk factors; Sacroiliac joint

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6659087/>

#### *Manual handling*

#### **Cumulative physical workload and mobility limitations in middle-aged men and women: a population-based study with retrospective assessment of workload.**

**Purpose:** To assess the association between exposure to physical workload throughout working life and risk of mobility limitations in midlife in a population-based Danish cohort. **Methods:** The study was cross-sectional with a retrospective exposure assessment, and data were from a questionnaire used in the Copenhagen Aging and Biobank. Cumulative physical workload was estimated by combining information about the participants' employments and data from a job exposure matrix. Daily amount of lifting was standardised in ton-years (lifting 1000 kg/day/year) and grouped in 5 exposure groups (no/minor (1-2 ton-years)/low (3-10 ton-years)/moderate (11-20 ton-years)/high exposure (> 20 ton-years)). The outcome was self-reports of mobility limitations (running 100 m, walking 400 m, and climbing stairs to the 2nd floor) in midlife. The association between exposure and outcome was analysed using logistic regression models. **Results:** We included 4996 men and 2247 women, mean age 56 years. 21% of men and 10% of women were in the highest exposure-group (> 20 ton-years). Higher cumulative exposure was associated with higher odds for mobility limitations. Exposure to more than 20 ton-years

compared to no exposure increased the odds for limitations in walking, age-adjusted odds ratio (OR) 3.2 (95% CI: 2.4-4.3) for men, 2.3 (1.4-3.8) for women. Corresponding results for running: 2.5 (2.2-3.0) for men, 1.6 (1.2-2.2) for women, and for limitations in climbing stairs: 4.2 (3.3-5.2) for men, 1.7 (1.2-2.4) for women. Results were attenuated when confounders were added. Conclusions: Exposure to physical workload throughout working life is associated with higher odds for mobility limitations in midlife.

**Moller et al. 2019.**

**International Archives of Occupational and Environmental Health, vol. 92, no. 5.**

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**Keywords:** Cumulative exposure; Job exposure matrix; Mobility limitations; Physical workload

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007%2Fs00420-019-01399-3>

### *Community health*

**Do employees from less-healthy communities use more care and cost more? Seeking to establish a business case for investment in community health.**

This study explored whether adult workers living in less-healthy communities used more health care services or were more expensive to employers than employees from healthier communities. Workers were mapped to zip code regions in Philadelphia and correlated with emergency department (ED) use, hospital use, and paid claims. The study found the health of communities in which workers live was associated with ED use, but not for hospitalizations or paid claims. This finding suggests a need for more primary care access.

**McIntire et al. 2019.**

**Preventing Chronic Diseases, vol. 16, no. 95.**

**Keywords:** Employees; Less-Healthy communities; Community health; Cost

**Evidence Level:** 4B

**Link:** [https://www.cdc.gov/pcd/issues/2019/18\\_0631.htm](https://www.cdc.gov/pcd/issues/2019/18_0631.htm)