

ABOUT RESEARCH ALERT

Research Alert is a service provided to you by the Institute for Work & Health (IWH) to help you keep abreast of recent literature in the areas of occupational health and safety, epidemiology, public health and others within the IWH mandate. Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. Research Alerts should not be considered an endorsement of the findings. Readers are cautioned not to act on the results of single studies, but rather to seek bodies of evidence. It should also be noted that the Institute for Work & Health cannot provide full-text of articles listed in Research Alerts to individuals outside of the organization, as this violates copyright legislation.

Journal articles marked with an asterisk indicate an IWH scientist or adjunct scientist is included in the list of authors.

***Huang YH, Sears JM, He Y, Courtney TK, Rega E, and Kelly A. The utility of a safety climate scale among workers with a work-related permanent impairment who have returned to work. *Work*. 2022; [epub ahead of print].**

<https://doi.org/10.3233/WOR-205285>

Abstract: BACKGROUND: Safety climate (SC) is a robust leading indicator of occupational safety outcomes. There is, however, limited research on SC among workers who have returned to work with a work-related permanent impairment. OBJECTIVE: This study examined three propositions: (1) a two-level model of SC (group-level and organization-level SC) will provide the best fit to the data; (2) antecedent factors such as safety training, job demands, supervisor and coworker support, and decision latitude will predict SC; and (3) previously reported associations between SC and outcomes such as reinjury, work-family conflict, job performance, and job security will be observed. METHOD: A representative cross-sectional survey gathered information about experiences during the first year of work reintegration. About one year after claim closure, 599 interviews with workers were conducted (53.8% response rate). Confirmatory factor analyses were conducted to test the factor structure of the SC construct. Further, researchers used correlation analyses to examine the criterion-related validity. RESULTS: Consistent with general worker populations, our findings suggest the following: (1) the two-factor structure of SC outperformed the single-factor structure in our population of workers with a permanent impairment; (2) correlations demonstrate that workplace safety training, decision latitude, supervisor support, coworker support, and job demands could predict SC; and (3) SC may positively

impact reinjury risk, work-family conflict, and may increase job performance and job security. **CONCLUSIONS:** Our study validated a two-factor SC scale among workers with a history of disabling workplace injury or permanent impairment who have returned to work. Practical applications of this scale will equip organizations with the necessary data to improve working conditions for this population

Akgun M, Ozmen I, Ozari Yildirim E, Tuzun B, Nur Toreyin Z, Kayinova A, et al. Pitfalls of using the ILO classification for silicosis compensation claims. *Occupational Medicine*. 2022; 72(6):372-377.

<https://doi.org/10.1093/occmed/kqac010>

Abstract: **BACKGROUND:** The International Labour Organization (ILO) Classification of Radiographs of Pneumoconioses is used as the primary tool to determine compensation for pneumoconiosis in Turkey. **AIMS:** We aimed to evaluate how the ILO classification applied, but obtaining chest radiographs in the workplace for screening until the completion of compensation claim files by the referral centres, based on the ILO reading. **METHODS:** The study included 320 digital chest radiographs previously taken for screening from eight different ceramic factories and having finalised claim files by referral centres. We used an expert reference panel consisting of five ILO readers to re-evaluate all the radiographs independently using ILO standard films and reached a conclusion based on the agreement among at least three readers. The evaluation primarily included technical quality and silicosis diagnosis with an ILO 1/0 or above small profusion. The results were compared with previous findings. **RESULTS:** Sixty-three (20%) chest radiographs were unacceptable for classification purposes according to the ILO technical quality grades. Among the remaining 257 chest radiographs, we diagnosed 103 with silicosis (40%), while the referral centres diagnosed 182 (71%). A discrepancy was found between our results and previous evaluations. We diagnosed silicosis in 50% and 17% of the previous silicosis and normal evaluations, respectively. **CONCLUSIONS:** Our findings suggest that the use of the ILO classification for compensation claims may be problematic due to the way of its implementation in Turkey in addition to its subjectivity

Bosma AR, Boot CRL, Schaap R, Schaafsma FG, and Anema JR. Participatory approach to create a supportive work environment for employees with chronic conditions: a pilot implementation study. *Journal of Occupational & Environmental Medicine*. 2022; 64(8):665-674.

<https://doi.org/10.1097/JOM.0000000000002557> [open access]

Abstract: **OBJECTIVE:** To evaluate a pilot implementation of an organizational-level intervention. The participatory approach (PA) was used to create a supportive work environment for employees with chronic conditions, with a key role for occupational physicians (OPs). **METHODS:** Twenty-eight semi-structured interviews were conducted with OPs and stakeholders within their organizations. Furthermore, observational data and research notes were gathered. Data analysis occurred through content analysis. **RESULTS:**

Recruitment of organizations was challenging, with a reach of 25%. Dose delivered, dose received, and fidelity differed across the three organizations. Organizations were positive about the PA as a method to improve support for employees with chronic conditions. CONCLUSIONS: The PA could be of added value for creating a supportive work environment. However, research is needed on activating organizations to improve support for employees with chronic conditions

Carleton RN, Kratzig GP, Sauer-Zavala S, Neary JP, Lix LM, Fletcher AJ, et al. The Royal Canadian Mounted Police (RCMP) Study: protocol for a prospective investigation of mental health risk and resilience factors. Health Promotion and Chronic Disease Prevention in Canada. 2022; 42(8):319-333.

<https://doi.org/10.24095/hpcdp.42.8.02> [open access]

Abstract: The Royal Canadian Mounted Police (RCMP), like all public safety personnel (PSP), are frequently exposed to potentially psychologically traumatic events that contribute to posttraumatic stress injuries (PTSI). Addressing PTSI is impeded by the limited available research. In this protocol paper, we describe the RCMP Study, part of the concerted efforts by the RCMP to reduce PTSI by improving access to evidence-based assessments, treatments and training as well as participant recruitment and RCMP Study developments to date. The RCMP Study has been designed to (1) develop, deploy and assess the impact of a system for ongoing annual, monthly and daily evidence-based assessments; (2) evaluate associations between demographic variables and PTSI; (3) longitudinally assess individual differences associated with PTSI; (4) augment the RCMP Cadet Training Program with skills to proactively mitigate PTSI; and (5) assess the impact of the augmented training condition (ATC) versus the standard training condition (STC). Participants in the STC (n = 480) and ATC (n = 480) are assessed before and after training and annually for 5 years on their deployment date; they also complete brief monthly and daily surveys. The RCMP Study results are expected to benefit the mental health of all participants, RCMP and PSP by reducing PTSI among all who serve

Farrants K and Alexanderson K. Trajectories of sickness absence and disability pension days among 189,321 white-collar workers in the trade and retail industry; a 7-year longitudinal Swedish cohort study. BMC Public Health. 2022; 22(1):1592.

<https://doi.org/10.1186/s12889-022-14005-y> [open access]

Abstract: Objective: 1) identify different trajectories of annual mean number of sickness absence (SA) and disability pension (DP) days among privately employed white-collar workers in the trade and retail industries and 2) investigate if sociodemographic and work-related characteristics were associated with trajectory membership. Methods: A longitudinal population-based cohort register study of all white-collar workers in the trade and retail industry in 2012 in Sweden (N = 189,321), with SA and DP data for 2010-2016. Group-based trajectory analysis was used to identify groups of individuals who followed similar trajectories of SA/DP days. Multinomial logistic regression was used to determine associations between

sociodemographic and work-related factors and trajectory membership. Results: We identified four trajectories of SA/DP days. Most individuals (73%) belonged to the trajectory with 0 days during all seven years, followed by a trajectory of few days each year (24%). Very small minorities belonged to a trajectory with increasing SA/DP days (1%) or to constantly high SA/DP (2%). Men had a lower risk of belonging to any of the three trajectories with SA/DP than women (OR Low SA/DP 0.42, 95% CI 0.41-0.44; Increasing SA/DP 0.34, 0.30-0.38; High SA/DP 0.33, 0.29-0.37). Individuals in occupations with low job control had a higher risk of belonging to the trajectory High SA/DP (OR low demands/low control 1.51; 95% CI 1.25-1.83; medium demands/low control 1.47, 1.21-1.78; high demands/low control 1.35, 1.13-1.61). Conclusion: Most white-collar belonged to trajectories with no or low SA/DP. Level of job control was more strongly associated with trajectory memberships than level of job demands.

Gonzalez Fuentes A, Busto Serrano NM, Sanchez Lasheras F, Fidalgo Valverde G, and Suarez Sanchez A. Work-related overexertion injuries in cleaning occupations: an exploration of the factors to predict the days of absence by means of machine learning methodologies. *Applied Ergonomics*. 2022; 105:103847.

<https://doi.org/10.1016/j.apergo.2022.103847> [open access]

Abstract: The special characteristics of the cleaning industry have an important impact on the health and safety of its workforce. Making use of data from more than 79,000 occupational accidents, the aim of the present research is to use machine learning techniques to develop a model to predict incapacity for work (expressed in days of absence) due to work-related overexertion injuries among service sector cleaners in Spain. The severity of accidents caused by overexertion depends on several factors that can be classified into the following categories: injury typology, individual factors, employment conditions, accident circumstances and health and safety management and standards in the company

Gonzales A, Lin JH, and Cha JS. Physical activity changes among office workers during the COVID-19 pandemic lockdown and the agreement between objective and subjective physical activity metrics. *Applied Ergonomics*. 2022; 105:103845.

<https://doi.org/10.1016/j.apergo.2022.103845> [open access]

Abstract: After the onset of the COVID-19 pandemic, many office workers transitioned to working-from-home (WFH) which altered routine physical activity (PA). To understand how these workers' PA were affected throughout the pandemic, PA data collected in January, April, June, and December 2020 with an activity tracker and a validated survey were analyzed. Between January and December, it was found that step counts during the weekday decreased ($p < 0.01$), weekday heart rate was higher than weekends ($p < 0.01$), activity-tracker and self-reported PA decreased ($p < 0.01$), and sitting time increased ($p < 0.01$). To understand the agreement between the objective and subjective METs, Bland-Altman analyses were completed and demonstrated an acceptable level of agreement. Findings show

decreased level of PA amongst WFH office workers and that the activity tracker and survey are reliable methods of recording WFH PA.

Hopwood P and MacEachen E. Policy and practice note: policy, safety, and regulation with regard to Ontario home care clients and personal support workers. Canadian Journal on Aging. 2022; 41(3):490-498.

<https://doi.org/10.1017/S0714980821000209>

Abstract: In light of COVID-19 and elevated concerns for the health of older Canadians receiving care, this Policy and Practice Note explores the confluence of the current home care policy landscape and the organisation of personal support worker (PSW) work, and highlights the need to consider governance of PSW work generally, and in-home and community care especially. PSWs are currently not professionally regulated, nor is there a central site documenting location, education, or any form of verification of the PSW workforce. Home care PSWs often provide physical care in isolated settings with no in-person supervision. In home and community health care, complaints about PSWs can be scattered among different service providers or client files not linked to or searchable by PSW name. This policy note explores how these factors and the currently unregulated status of PSWs affect home care safety in general as well as in the context of COVID-19, Ontario's decentralised home care system, and efforts towards professional regulation

Hulsegge G, Otten W, van de Ven HA, Hazelzet AM, and Blonk RWB. Employers' attitude, intention, skills and barriers in relation to employment of vulnerable workers. Work. 2022; 72(4):1215-1226.

<https://doi.org/10.3233/WOR-210898>

Abstract: Background: Little is known why some organizations employ vulnerable workers and others do not. Objective: To explore the relationships between the attitude, intention, skills and barriers of employers and employment of vulnerable workers. Methods: We included 5,601 inclusive organizations (=1% of employees had a disability, was long-term unemployed or a school dropout) and 6,236 non-inclusive organizations of the Netherlands Employers Work Survey 2014-2019. We operationalized employer factors based on the Integrative Model of Behavioral Prediction as attitude (negative impact), intention (mission statement regarding social inclusion), skills (human resources policies and practices), and barriers (economic conditions and type of work). We used multivariate-adjusted logistic regression models. Results: Compared to non-inclusive organizations, inclusive organizations had a more negative attitude (OR:0.81) and a stronger intention to employ vulnerable workers (OR:6.09). Regarding skills, inclusive organizations had more inclusive human resources practices (OR:4.83) and initiated more supporting human resources actions (OR:4.45). Also, they adapted more work conditions towards the needs of employees (OR:1.52), negotiated about work times and absenteeism (OR:1.49), and had general human resources practices on, for example, employability (OR:1.78). Inclusive organizations had less barriers reflected by better financial results (OR:1.32), more employment opportunities

(OR:1.33) and more appropriate work tasks (OR:1.40). Conclusions: Overall, inclusive organizations reported more positive results on the employer factors of the Integrative Model of Behavioral Prediction, except for a more negative attitude. The more negative attitude might reflect a more realistic view on the efforts to employ vulnerable groups, and suggests that other unmeasured emotions and beliefs are more positive.

Kamardeen I and Hasan A. Occupational health and safety implications of an aging workforce in the Australian construction industry. *Journal of Construction Engineering and Management*. 2022; 148(10):04022112.

[https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0002373](https://doi.org/10.1061/(ASCE)CO.1943-7862.0002373)

Lee W, Yragui NL, Anderson NJ, Howard N, Lin JH, and Bao S. The job demand-control-support model and work-related musculoskeletal complaints in daytime and nighttime janitors: the mediating effect of burnout. *Applied Ergonomics*. 2022; 105:103836.

<https://doi.org/10.1016/j.apergo.2022.103836>

Abstract: Janitors' jobs require repetitive work with low control (skill discretion, decision authority) and social support. Previous studies have found this constellation of work conditions leads to high stress levels. This study investigated the relationships among job demand-control-support, burnout, and musculoskeletal symptoms for commercial janitors in Washington State. Structural equation modeling was performed using data from 208 participants with analyses comparing models of daytime and nighttime janitors. Burnout fully mediated the relationship between job demands and musculoskeletal complaints among daytime janitors. Among nighttime janitors, burnout mediated between job demands, job control, and social support, and musculoskeletal complaints. The nighttime janitors' model was more fully supported compared to the daytime model. This study is one of a small number that examine and bring attention to the importance of janitors' burnout. Recommendations to improve the psychosocial work environment toward mitigating burnout and reducing musculoskeletal complaints are provided

Magnavita N, Chiorri C, Acquadro Maran D, Garbarino S, Di Prinzio RR, Gasbarri M, et al. Organizational justice and health: a survey in hospital workers. *International Journal of Environmental Research and Public Health*. 2022; 19(15):9739.

<https://doi.org/10.3390/ijerph19159739> [open access]

Abstract: In complex systems such as hospitals, work organization can influence the level of occupational stress and, consequently, the physical and mental health of workers. Hospital healthcare workers were asked to complete a questionnaire during their regular occupational health examination, in order to assess the perceived level of organizational justice, and to verify whether it was associated with occupational stress, mental health, and absenteeism. The questionnaire included the Colquitt Organizational Justice (OJ) Scale, the Karasek/Theorell demand-control-support (DCS) questionnaire for occupational stress, and the General Health Questionnaire (GHQ12) for mental health. Workers were also required to

indicate whether they had been absent because of back pain in the past year. Organizational justice was a significant predictor of occupational stress. Stress was a mediator in the relationship between justice and mental health. Occupational stress was more closely related to perceptions of lack of distributive justice than to perceptions of procedural, informational, and interpersonal justice. Physicians perceived significantly less distributive justice than other workers. In adjusted univariate logistic regression models, the perceptions of organizational justice were associated with a significant reduction in the risk of sick leave for back pain (OR 0.96; CI95% 0.94-0.99; $p < 0.001$), whereas occupational stress was associated with an increased risk of sick leave (OR 6.73; CI95% 2.02-22.40; $p < 0.002$). Work organization is a strong predictor of occupational stress and of mental and physical health among hospital employees

Parent-Lamarche A, Marchand A, and Saade S. Psychological distress in the workplace: the indirect contribution of work organization conditions to work performance. *Work*. 2022; 72(4):1469-1480.

<https://doi.org/10.3233/WOR-210843>

Abstract: BACKGROUND: Psychological distress affects between 5 and 27% of the general population [1]. Workers facing stressful work conditions are especially at high risk for experiencing psychological distress [1]. OBJECTIVES: To evaluate the association between work organization conditions and work performance via psychological distress. While the individual contribution of work organization conditions to psychological distress and work performance has been examined in the scientific literature, their combined influence on work performance remains relatively unknown. METHODS: To adjust for design effects, we relied on cluster sampling (employees working in organizations). MPlus was used to conduct path analyses [2]. RESULTS: While psychological demands, number of hours worked, and job insecurity were positively associated with psychological distress, job recognition was negatively associated with it. In the same vein, irregular work schedules and job insecurity seem to be negatively associated with work performance. On the one hand, skill utilization, decision latitude, recognition, and job promotion, all seemed to be positively associated with employee's work performance. On the other hand, psychological demands, number of hours worked, and job insecurity were negatively and indirectly associated with work performance. CONCLUSIONS: Understanding the indirect association between work variables and workers' psychological distress could promote their work performance. Understanding this association could help shed light on the difficulties employees with psychological distress face while meeting their job requirements. The results of this study should serve as a reminder to intervene on work organization conditions

Rosenman KD and Wang L. Opioid prescriptions for individuals receiving workers' compensation in Michigan. PLoS ONE. 2022; 17(8):e0272385.

<https://doi.org/10.1371/journal.pone.0272385> [open access]

Abstract: PURPOSE: We evaluated the prevalence of opioid prescriptions after injury and associated characteristics among workers receiving workers' compensation for a lost work time injury. METHODS: Injured workers identified in Michigan's Workers' Compensation records from 2016 to 2018 were linked to the opioid prescription history in the Michigan Automated Prescription System. RESULTS: Among the 46,934 injured workers with paid claims, the prevalence of receiving an opioid prescription, morphine milligram equivalents (MME) per prescription, number of opioid prescription and probability of receiving opioids prescription >90 days after injury decreased from 2016-2018. Despite the decrease over 50% of the injured workers received an opioid prescription. Being over 34 years, a male, having had an opioid prescription before the injury, working in construction or having an amputation or sprain/strain of the shoulder had a significantly higher probability of receiving an opioid prescription, a higher MME per prescription, a higher number of opioid prescriptions and a higher probability having opioids prescription >90 days after the injury. CONCLUSIONS: Even though opioid prescribing patterns generally decreased from 2016 to 2018 (64.5-52.8%), injured workers in Michigan had a higher prevalence of opioid prescription after injury, than those reported from other states

Seong S, Park S, Ahn YH, and Kim H. Development of an integrated fatigue measurement system for construction workers: a feasibility study. BMC Public Health. 2022; 22(1):1593.

<https://doi.org/10.1186/s12889-022-13973-5> [open access]

Abstract: Background: Construction workers working in physically and mentally challenging environments experience high levels of occupational fatigue, which is the primary cause of industrial accidents and illnesses. Therefore, it is very important to measure fatigue in real time to manage the safety and health of construction workers. This study presents a novel approach for simultaneously measuring the subjective and objective fatigue of construction workers using ecological momentary assessment (EMA) and smartwatches. Due to the complexity and diversity of construction site environments, it is necessary to examine whether data collection using smartwatches is suitable in actual construction sites. This study aims to examine the feasibility of the integrated fatigue measurement method. Methods: This study comprised two phases: (1) development of an integrated fatigue measurement system for construction workers, and (2) a validation study to evaluate the method's feasibility based on sensor data acquisition, EMA compliance, and feedback from construction workers in the field (N = 80). Three days of biometric data were collected through sensors embedded in the smartwatches for objective fatigue measurement, including heart rate, accelerometer, and gyroscope data. Two types of self-reported data regarding each worker's fatigue were collected through a researcher-developed EMA application. The acceptability and usability of this system were examined based on the researchers' observations and unstructured interviews. Results: Based on the standardized

self-report questionnaire scores, participants were classified into high (n = 35, 43.75%) and low (n = 45, 56.25%) fatigue groups for comparison. The quantitative outcomes did not show a statistically significant difference between the two fatigue groups. Both groups experienced positive emotions and were able to recognize their health condition at the time of self-reporting, but stated that responding to this measurement system could be burdensome. Conclusions: This feasibility study provides a unique understanding of the applications of EMA and smartwatches for safety management in the construction workforce. The developed measurement system shows potential for monitoring fatigue based on the real-time collection of relevant data. It is expected that by expanding this integrated system through further research and onsite application, the health and safety of construction workers can be improved.

Wutschert MS, Romano-Pereira D, Suter L, Schulze H, and Elfering A. A systematic review of working conditions and occupational health in home office. *Work*. 2022; 72(3):839-852.

<https://doi.org/10.3233/WOR-205239>

Abstract: BACKGROUND: In times of the COVID-19 pandemic, employees around the world may be practicing part-time telework at home. Little is known about the working conditions at home and its impact on the employee's occupational health. OBJECTIVE: This systematic review examines the working conditions at employees' homes, the work-related disorders associated with working from home, organizations' perceptions of ergonomics at home and how they support their teleworkers. METHODS: A search of electronic databases (Cochrane Library, Embase, Medline, Google Scholar, Open Grey, Pedro, PsychInfo, PubPsych, Scopus and Web of Science) was performed. Twelve studies were included in this review. RESULTS: The findings highlight the lack of ergonomic working conditions for home-based teleworkers. Furthermore, the results underline organizations' lack of awareness regarding home-based policies, ergonomics programs and the health-related consequences associated with the absence of ergonomic support. CONCLUSION: These findings suggest that home-based teleworkers have increased health risks. This assumption is substantiated by the fact that most of the included studies reported teleworkers who have experienced musculoskeletal issues. These results underline the necessity for implementing ergonomic design recommendations, especially for working at home. Further research is needed to understand the impact of ergonomics programs and workplace design for working at home

Missed an issue? Catch up on previous Research Alerts available on the IWH website www.iwh.on.ca/journal-articles/research-alerts