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

**\*Biswas A, Chen C, Dobson KG, Prince SA, Shahidi FV, Smith PM, et al. Identifying the sociodemographic and work-related factors related to workers' daily physical activity using a decision tree approach. BMC Public Health. 2023; 23(1):1853.**

<https://doi.org/10.1186/s12889-023-16747-9> [open access]

**Abstract:** BACKGROUND: The social and behavioural factors related to physical activity among adults are well known. Despite the overlapping nature of these factors, few studies have examined how multiple predictors of physical activity interact. This study aimed to identify the relative importance of multiple interacting sociodemographic and work-related factors associated with the daily physical activity patterns of a population-based sample of workers. METHODS: Sociodemographic, work, screen time, and health variables were obtained from five, repeated cross-sectional cohorts of workers from the Canadian Health Measures Survey (2007 to 2017). Classification and Regression Tree (CART) modelling was used to identify the discriminators associated with six daily physical activity patterns. The performance of the CART approach was compared to a stepwise multinomial logistic regression model. RESULTS: Among the 8,909 workers analysed, the most important CART discriminators of daily physical activity patterns were age, job skill, and physical strength requirements of the job. Other important factors included participants' sex, educational attainment, fruit/vegetable intake, industry, work hours, marital status, having a child living at home, computer time, and household income. The CART tree had moderate classification accuracy and performed marginally better than the stepwise multinomial logistic regression model. CONCLUSION: Age and work-related factors-particularly job skill, and physical strength requirements at work-

appeared as the most important factors related to physical activity attainment, and differed based on sex, work hours, and industry. Delineating the hierarchy of factors associated with daily physical activity may assist in targeting preventive strategies aimed at promoting physical activity in workers

**\*Marchand AA, Hogg-Johnson S, and Cote P. Baseline depressive symptoms do not moderate the association between baseline symptom severity and time to recovery in individuals with grade I-II whiplash-associated disorders: a secondary analysis of a randomized controlled trial. American Journal of Physical Medicine & Rehabilitation. 2023; 102(10):861-866.**

<https://doi.org/10.1097/PHM.0000000000002223>

Abstract: Objective: This study investigated the moderating role of baseline depressive symptoms on the association between baseline pain severity and time to recovery in individuals with acute grade I-II whiplash-associated disorders. Design: This is a secondary analysis of a randomized controlled trial investigating the effectiveness of a government-regulated rehabilitation guideline for the management of grade I-II whiplash-associated disorders. Participants who completed baseline questionnaires for neck pain intensity and depressive symptoms and follow-up questionnaire on self-reported recovery were included in the analysis. Cox proportional hazards models were built, and hazard rate ratios were reported to describe the association between baseline neck pain intensity and time to self-reported recovery and to assess the effect modification of baseline depressive symptoms. Results: Three hundred three participants provided data for this study. Despite baseline level of depressive symptoms and neck pain intensity being independently associated with delayed recovery, the association between baseline neck pain intensity and time to recovery was not stronger for individuals with significant postcollision depressive symptoms (hazard rate ratio = 0.91; 95% confidence interval = 0.79-1.04) than for those without depressive symptoms (hazard rate ratio = 0.92; 95% confidence interval = 0.83-1.02). Conclusions: Baseline depressive symptoms are not an effect modifier of the association between baseline neck pain intensity and time to self-reported recovery in acute whiplash-associated disorders. Trial registration: ClinicalTrials.gov NCT00546806. Copyright © 2023 Wolters Kluwer Health, Inc. All rights reserved.

**Bayona A, Bhandari S, Hallowell M, Sherratt F, Bailey JM, and Upton J. What is a serious injury? A model for defining serious injuries & fatalities. Professional Safety. 2023; 68(9):22-30.**

[DOI unavailable as of Sept 29, 2023]

**Castillo DN, Schuler CR, Socias-Morales CM, and Sinelnikov S. 2022 National Occupational Injury Research Symposium (NOIRS): preventing workplace injuries in a changing world. *Journal of Safety Research*. 2023; 86:2-4.**

<https://doi.org/10.1016/j.jsr.2023.06.009>

**Abstract:** About NOIRS: The National Occupational Injury Research Symposium (NOIRS) is the only conference solely dedicated to occupational injury research and prevention. The 8th NOIRS, sponsored by the National Institute for Occupational Safety and Health (NIOSH) and several partners, was held on May 10-12, 2022. NOIRS was held entirely virtually in response to concerns of the COVID-19 pandemic and honoring the symposium theme "Preventing Workplace Injuries in a Changing World." About this Special Issue: The intent of this issue is to highlight the breadth of high-quality presentations at NOIRS, and to make them available to those who did not participate in the conference. This issue includes three short communication articles and nine research articles. Featured research articles in this special issue span a wide variety of methods, data sources, and worker populations. They address leading and emerging causes and contributors to occupational injury in a range of industries and occupations. Concluding Remarks: We hope that this special issue provides readers with a view into some of the research presented at the 2022 NOIRS. We also hope the articles are useful for research and practice, and thinking toward the future

**DeBeer BB, Mignogna J, Nance M, Bahraini N, Penzenik M, and Brenner LA. COVID-19 and lifetime experiences of trauma, moral injury, and institutional betrayal among healthcare providers. *Journal of Occupational & Environmental Medicine*. 2023; 65(9):745-750.**

<https://doi.org/10.1097/JOM.0000000000002891>

**Abstract:** OBJECTIVE: The aim of the study is to increase understanding regarding healthcare provider experiences with psychological trauma, moral injury, and institutional betrayal, both over the lifetime and during the COVID-19 pandemic. METHODS: The study employed a cross-sectional design to understand traumatic experiences, moral injury, and institutional betrayal among medical and mental health providers. Participants were asked to identify an index trauma, and experiences were coded qualitatively using categories for traumatic events, moral injury, and institutional betrayal. RESULTS: Results revealed that experiences of trauma, moral injury, and institutional betrayal were common in relation to the pandemic, as were prepandemic histories of traumatic exposures. Findings indicate that trauma exposure was a work hazard for healthcare providers during the pandemic, which could result in negative long-term mental health outcomes. CONCLUSIONS: Future research is needed to explore potential long-term negative outcomes among healthcare providers

**Duffee B and Willis DB. Paramedic perspectives of job stress: qualitative analysis of high-stress, high-stakes emergency medical situations. *Social Science & Medicine*. 2023; 333:116177.**

<https://doi.org/10.1016/j.socscimed.2023.116177>

**Abstract:** The time from when an ambulance paramedic receives the 911 alarm notification until they have determined the differential diagnosis of a patient is highly stressful. During this time, there is a high demand placed on the paramedic, and they have a low level of control. Recent advances in prehospital care that place more responsibility on paramedics have exacerbated this high-stress phenomenon. Twenty paramedics from across the United States were interviewed and evaluated using descriptive phenomenology to better understand one of the most stressful moments of high-stakes decision-making that paramedics regularly face. Using descriptive phenomenology, we identified six categories in the paramedics' interview responses: pressure, overwhelm, emotional extremes (with sub-categories of adrenaline rush and time-dilation), dissociation, multi-tasking, and disconnect. This analysis of the paramedic's lived experience of this high-stress, high-stakes phenomenon provides insight into how paramedics experience the unique stress of this phenomenon. This understanding is key to elucidating the effects of this acute stress that may impact the judgment and, ultimately, the care performed by the paramedic. Both early- and late-career paramedics from thirteen different states in all regions of the United States were interviewed. Further qualitative data from paramedics from a diverse range of regions and backgrounds are essential to identify ways in which to ameliorate the negative effects of acute stress experienced by paramedics. Addressing such issues will reduce turnover and burnout among paramedics

**Goldkuhle M, Guyatt GH, Kreuzberger N, Akl EA, Dahm P, van Dalen EC, et al. GRADE concept 4: rating the certainty of evidence when study interventions or comparators differ from PICO targets. *Journal of Clinical Epidemiology*. 2023; 159:40-48.**

<https://doi.org/10.1016/j.jclinepi.2023.04.018>

**Abstract:** OBJECTIVES: This Grading of Recommendations Assessment, Development and Evaluation (GRADE) concept article offers systematic reviewers, guideline authors, and other users of evidence assistance in addressing randomized trial situations in which interventions or comparators differ from those in the target people, interventions, comparators, and outcomes. To clarify what GRADE considers under indirectness of interventions and comparators, we focus on a particular example: when comparator arm participants receive some or all aspects of the intervention management strategy (treatment switching). STUDY DESIGN AND SETTING: An interdisciplinary panel of the GRADE working group members developed this concept article through an iterative review of examples in multiple teleconferences, small group sessions, and e-mail correspondence. After presentation at a GRADE working group meeting in November 2022, attendees approved the final concept paper, which we support with examples from systematic reviews and individual trials. RESULTS: In the presence of safeguards against risk of bias, trials provide unbiased estimates

of the effect of an intervention on the people as enrolled, the interventions as implemented, the comparators as implemented, and the outcomes as measured. Within the GRADE framework, differences in the people, interventions, comparators, and outcomes elements between the review or guideline recommendation targets and the trials as implemented constitute issues of indirectness. The intervention or comparator group management strategy as implemented, when it differs from the target comparator, constitutes one potential source of indirectness: Indirectness of interventions and comparators-comparator group receipt of the intervention constitutes a specific subcategory of said indirectness. The proportion of comparator arm participants that received the intervention and the apparent magnitude of effect bear on whether one should rate down, and if one does, to what extent. CONCLUSION: Treatment switching and other differences between review or guideline recommendation target interventions and comparators vs. interventions and comparators as implemented in otherwise relevant trials are best considered issues of indirectness

**Ireland A, Johnston D, and Knott R. Heat and worker health. *Journal of Health Economics*. 2023; 91:102800.**

<https://doi.org/10.1016/j.jhealeco.2023.102800>

Abstract: Extreme heat negatively impacts cognition, learning, and task performance. With increasing global temperatures, workers may therefore be at increased risk of work-related injuries and illness. This study estimates the effects of temperature on worker health using records spanning 1985-2020 from an Australian mandatory insurance scheme. High temperatures are found to cause significantly more claims, particularly among manual workers in outdoor-based industries. These adverse effects have not diminished across time, with the largest effect observed for the 2015-2020 period, indicating increasing vulnerability to heat. Within occupations, the workers most adversely affected by heat are female, older-aged and higher-earning. Finally, results from firm-level panel analyses show that the percentage increase in claims on hot days is largest at "safer" firms

**Jain VM, Parihar SRS, Acharya S, and Acharya S. Effects of wearing personal protective equipment (PPE) and its role in affecting the work efficiency of dentists during the COVID-19 pandemic. *Work*. 2023; 76(1):3-10.**

<https://doi.org/10.3233/WOR-220083>

Abstract: Background: The risk of exposure to COVID-19 infection through droplets/aerosol in dental clinics has renewed focus on the utility and possible adverse effects of using personal protective equipment (PPE) on dentists. Objective: To obtain information from a cross-section of dentists regarding their PPE usage and to evaluate the possible risk factors that can influence their work efficiency. Methods: A 31-item cross-sectional survey with a structured multiple-choice questionnaire was designed. Social media and emails were used to circulate the questionnaire among dental professionals worldwide. A total of 317 respondents returned the completed forms. Results: A total of 184 (55%) participants reported getting soaking wet while wearing PPE at the end of the working hours (approximately eight hours of

working). Many respondents (n = 286, 90%) reported that the use of PPE resulted in reduced visibility of the operating field. The majority of respondents (84%) felt that their overall work efficiency had reduced after using PPE. Binary logistic regression had shown that two significant factors that were associated with reduced work efficiency included, pre-existing systemic illness and getting soaking wet from wearing a PPE. Conclusion: Definite protocols should be introduced that mandate the doffing of PPE for every patient, in a separate well-ventilated area where the skin can recuperate from the heat and pressure points caused by the PPE. Dentists should take greater care in choosing the appropriate PPE to prevent exacerbation of pre-existing illnesses, which may reduce their work efficiency.

**Martin CJ, Woods S, Bertke S, Pinkerton L, and Jin C. Increased mortality associated with disability among workers' compensation claimants with upper extremity neuropathy.**

**Journal of Occupational & Environmental Medicine. 2023; 65(9):798-802.**

<https://doi.org/10.1097/JOM.0000000000002910>

Abstract: OBJECTIVE: The aim of the study was to evaluate and compare mortality after disabling and nondisabling occupational injuries. METHODS: Vital status was ascertained through 2020 for 2077 individuals with a workers' compensation claim for upper extremity neuropathy in West Virginia in 1998 or 1999. Standardized mortality ratios compared mortality to the West Virginia general population. Hazard ratios (HRs) obtained from Cox regression models compared mortality among those with and without lost work time or permanent disability. RESULTS: Overall, the standardized mortality ratio for accidental poisoning deaths was elevated (1.75, 95% confidence interval [CI]: 1.08-2.68). All-cause mortality HRs and cancer HRs were elevated for lost work time (HR = 1.09, 95% CI: 0.93-1.28; HR = 1.50, 95% CI: 1.09-2.08, respectively) and permanent disability (HR = 1.22, 95% CI: 1.04-1.44; HR = 1.78, 95% CI: 1.27-2.48, respectively). CONCLUSIONS: Work-related disability was associated with broad elevations in mortality

**National Safety Council. The new value of safety and health in a changing world. Literature review. Itasca, IL: National Safety Council; Lloyd's Register Foundation; 2023.**

**National Safety Council. The new value of safety and health in a changing world. Full report. Itasca, IL: National Safety Council; Lloyd's Register Foundation; 2023.**

**Ranasinghe U, Tang LM, Harris C, Li W, Montayre J, de Almeida Neto A, et al. A systematic review on workplace health and safety of ageing construction workers. Safety Science. 2023; 167:106276.**

<https://doi.org/10.1016/j.ssci.2023.106276> [open access]

Abstract: With the increasing demand for construction work and declining rates of young workers entering construction, the ageing workforce has become an important concern within the construction industry. Although there are benefits associated with an older workforce (e.g., experience, knowledge), there are also challenges, particularly related to



health that may adversely affect individual and organisational performance. Therefore, it is essential to develop a deep understanding of the empirical evidence related to physical and psychological issues facing the ageing workforce, and then to make recommendations to improve their work health and safety (WHS). This paper reviews the existing body of knowledge on health and safety in the ageing construction workforce. This study adopts the Joanna Briggs Institute (JBI) methodology for a scoping review. The articles included in the review were found by searching the Scopus and Web of Science databases using complex search strings developed based on keywords. Peer-reviewed journal articles published between 1980 and 2021 were retrieved for further screening. Following data extraction and a three-step screening procedure, 111 journal articles met the inclusion criteria. Results revealed numerous factors related to the ageing process that are often implicated with older workers' health and safety, including hearing loss, muscle pain, respiratory issues, and conditions resulting from the ageing process and prolonged work in and around construction sites. A critical content analysis of empirical and non-empirical studies revealed 27 strategies to support older construction workers and improve their safety and health at work. Inspection of mental health intervention studies revealed four successful interventions including alternative work arrangements, individual support programs, electronic mental health support programs, and health promotion program. Findings herein broaden the knowledge on health and safety requirements of the group of older construction workers that could assist industry practitioners in decision making and developing the best strategies to improve the workability and productivity of older construction workers.

**Skovlund SV, Blafoss R, Calatayud J, Lopez Bueno R, Sundstrup E, and Andersen LL. Musculoskeletal pain intensity and risk of long-term sickness absence in the general working population: a prospective cohort study with register follow-up. Preventive Medicine. 2023; 174:107636.**

<https://doi.org/10.1016/j.ypmed.2023.107636> [open access]

**Abstract:** Determining predictors of sickness absence could allow for better screening, guidance, and development of preventive efforts aimed at those in increased risk. This study aimed to determine the prospective association between musculoskeletal pain intensity and risk of incident register-based long-term sickness absence in the general working population, as well as to determine the population attributable fraction. Drawing on data from a nationwide questionnaire survey, this prospective cohort study followed a representative sample of the Danish general working population without recent long-term sickness absence (=6 consecutive weeks) (n = 69,273) for long-term sickness absence up to two years (mean follow-up: 93 weeks) in a national register. The predictor was musculoskeletal pain intensity in the neck/shoulder and low-back during the preceding three months rated on an 11-point numerical rating scale from 0 to 10. The weighted incidence of long-term sickness-absence was 8.9% during two-year follow-up (n = 6165). We observed a clear dose-response association between musculoskeletal pain intensity of the neck/shoulder or low-back and the risk of incident long-term sickness absence, with a lower threshold of increased risk of 4 and

3 (scale 0-10) for neck/shoulder (HR (95% CI): 1.25 (1.09-1.42)) and low-back pain (HR (95% CI): 1.13 (1.00-1.29)), respectively. Prevention of pain intensities at or above 4 out of 10 could potentially prevent 17% (population attributable fraction, PAF (95% CI): 16.8 (13.6-20.1)) of the total long-term sickness absence in the general working population. Large-scale interventions to prevent and manage musculoskeletal pain need to be documented and implemented.

**Yao M, Wang Y, Ren Y, Jia Y, Zou K, Li L, et al. Comparison of statistical methods for integrating real-world evidence in a rare events meta-analysis of randomized controlled trials. *Research Synthesis Methods*. 2023; 14(5):689-706.**

<https://doi.org/10.1002/jrsm.1648>

Abstract: Rare events meta-analyses of randomized controlled trials (RCTs) are often underpowered because the outcomes are infrequent. Real-world evidence (RWE) from non-randomized studies may provide valuable complementary evidence about the effects of rare events, and there is growing interest in including such evidence in the decision-making process. Several methods for combining RCTs and RWE studies have been proposed, but the comparative performance of these methods is not well understood. We describe a simulation study that aims to evaluate an array of alternative Bayesian methods for including RWE in rare events meta-analysis of RCTs: the naïve data synthesis, the design-adjusted synthesis, the use of RWE as prior information, the three-level hierarchical models, and the bias-corrected meta-analysis model. The percentage bias, root-mean-square-error, mean 95% credible interval width, coverage probability, and power are used to measure performance. The various methods are illustrated using a systematic review to evaluate the risk of diabetic ketoacidosis among patients using sodium/glucose co-transporter 2 inhibitors as compared with active-comparators. Our simulations show that the bias-corrected meta-analysis model is comparable to or better than the other methods in terms of all evaluated performance measures and simulation scenarios. Our results also demonstrate that data solely from RCTs may not be sufficiently reliable for assessing the effects of rare events. In summary, the inclusion of RWE could increase the certainty and comprehensiveness of the body of evidence of rare events from RCTs, and the bias-corrected meta-analysis model may be preferable.

**Zagrodney KAP, King EC, Simon D, Nichol KA, and McKay SM. Economic evidence for home and community care investment: the case for Ontario personal support workers' wage parity. *Healthcare Policy*. 2023; 19(1):23-31.**

<https://doi.org/10.12927/hcpol.2023.27161>

Abstract: The home and community care (HCC) sector is in a health human resource crisis. Particularly concerning is the shortage of personal support workers (PSWs) who provide the majority of HCC. This paper outlines a strategy to mitigate the HCC PSW shortage by applying appropriate funding to HCC and focusing on equal pay between HCC and institutional long-term care facilities' PSWs. Using publicly available data, our calculations estimate substantial



government cost-savings from investing in HCC PSWs to increase HCC capacity. Beyond the economic evidence, how such investments would benefit those seeking care are also highlighted

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