research alert

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

***Beliveau PJ, Johnston H, Van Eerd D, and Fischer SL. Musculoskeletal disorder risk assessment tool use: a Canadian perspective. Applied Ergonomics. 2022; 102:103740.**
https://doi.org/10.1016/j.apergo.2022.103740

Abstract: Canadian ergonomics professionals from the Association of Canadian Ergonomists (ACE) and Board of Canadian Registered Safety Professionals (BCRSP) participated in a web-based survey of their awareness, use, and factors influencing use of ergonomics musculoskeletal disorder (MSD) risk assessment tools. A total of 791 respondents (21.0% response rate) participated in the survey. Certified ergonomics professionals represented an important subpopulation of MSD risk assessment tool users, however; the vast majority (86.4%) of users within Canada were certified safety professionals. Average tool use varied between ACE and BCRSP groups, where ACE respondents on average use more tools than BCRSP respondents, however the top 10 tools used were similar between the groups. Over 45% of assessment tools were learned at school and average tool use was not influenced by years of experience or continuing education

Al Ali S, Pihl-Thingvad J, and Elklit A. The influence of coping and cognitive appraisal in predicting Posttraumatic Stress Disorder: a prospective study on workplace violence in psychiatric staff in Denmark. Work. 2022; 71(3):641-649.
https://doi.org/10.3233/WOR-205177

Abstract: Background: Since psychiatric staff experience a high occurrence of workplace violence and subsequent Posttraumatic Stress Disorder (PTSD), it is important to assess the

behavioral and cognitive risk factors of PTSD in this population. Objective: The current study assesses the incidence of PTSD 12 months after the occurrence of WV. Furthermore, it examines possible prospective associations between coping strategies and cognitive appraisals, respectively, and PTSD. Methods: This prospective cohort study was conducted with staff from 18 psychiatric wards in Denmark (n = 183) who had reported an incidence of workplace violence. Most subjects were women (83.3%). Results: The incidence of PTSD was 9.8%. The main analysis showed a significant relationship between negative cognitive appraisals about the self and PTSD (OR = 2.87, p < .05), and a coping strategy of self-blame and PTSD (OR = 2.21, p < .05). Conclusions: Certain dysfunctional coping strategies and negative cognitive appraisals seems to predict posttraumatic stress in an occupational context. Information about these processes could be important for preventive strategies in the workplace.

Backhaus I, Hermsen D, Timm J, Boege F, Lubke N, Gobels K, et al. Underascertainment of COVID-19 cases among first responders: a seroepidemiological study. Occupational Medicine. 2022; 72(3):225-228.
https://doi.org/10.1093/occmed/kqab164 [open access]
Abstract: BACKGROUND: Providing frontline support places first responders at a high risk for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. AIMS: This study was aimed to determine the anti-SARS-CoV-2 seroprevalence in a cohort of first responders (i.e. firefighters/paramedics), to detect the underascertainment rate and to assess risk factors associated with seropositivity. METHODS: We conducted a serological survey among 745 first responders in Germany during 27 November and 4 December 2020 to determine the anti-SARS-CoV-2 seroprevalence using Elecsys® Anti-SARS-CoV-2 immunoassay (Roche Diagnostics, Mannheim, Germany). As part of the examination, participants were asked to provide information on coronavirus disease 2019 (COVID-19)-like-symptoms, information on sociodemographic characteristics and workplace risk factors for a SARS-CoV-2 infection and any prior COVID-19 infection. Descriptive statistics and logistic regression analysis were performed and seroprevalence estimates were adjusted for test sensitivity and specificity. RESULTS: The test-adjusted seroprevalence was 4% (95% CI 3.1-6.2) and the underascertainment rate was 2.3. Of those tested SARS-CoV-2 antibody positive, 41% were aware that they had been infected in the past. Seropositivity was elevated among paramedics who worked in the emergency rescue team providing first level of pre-hospital emergency care (6% [95% CI 3.4-8.6]) and those directly exposed to a COVID-19 case (5% [95% CI 3.5-8.1]). Overall, the seroprevalence and the underascertainment rate were higher among first responders than among the general population. CONCLUSIONS: The high seroprevalence and underascertainment rate highlight the need to mitigate potential transmission within and between first responders and patients. Workplace control measures such as increased and regular COVID-19-testing and the prompt vaccination of all personnel are necessary

Carlan N, Szymanski T, Van Zetten J, Hilbrecht M, and Bigelow P. The path from survey development to knowledge activism: a case study of the use of a physical loads survey in a retail workplace. New Solutions. 2022; 32(1):65-76.
https://doi.org/10.1177/10482911221074680 [open access]
Abstract: Workers at a multi-site retailer were concerned that they were experiencing higher than anticipated work-related musculoskeletal disabilities (MSDs). They approached union leadership and academic researchers and a Participatory Action Research (PAR) project was developed which culminated in a targeted online Physical Loads Survey (PLS). The goal was to initiate discussions to design a preventative collaborative ergonomic program. Survey results confirmed that during a shift, workers had significant exposure to standing, carrying loads of more than 25 lbs, pushing and pulling loads greater than 225 lbs, and repetitive arm and hand movements. The successful survey was the first step in the development of a proactive health and safety program. The union proceeded without management participation and was able to move beyond knowledge creation to knowledge activism and change

Clin B, Gramond C, Thaon I, Brochard P, Delva F, Chammings S, et al. Head and neck cancer and asbestos exposure. Occupational & Environmental Medicine. 2022; [epub ahead of print].
https://doi.org/10.1136/oemed-2021-108047 [open access]
Abstract: Objectives: The aim of this study was to analyse, within a French cohort of workers previously occupationally exposed to asbestos, incidence and mortality from various sites of head and neck cancers (larynx excluded) and to examine the potential link of these cancers with pleural plaques. Methods: A 10-year follow-up study was conducted in the 13 481 male subjects included in the cohort between October 2003 and December 2005. Asbestos exposure was assessed by industrial hygienist analysis of a standardised questionnaire. The final cumulative exposure index (CEI; in equivalent fibres.years/mL) for each subject was calculated as the sum of each employment period's four-level CEI. The number of head and neck cancers recorded by the National Health Insurance fund was collected in order to conduct an incidence study. Complementary analysis was restricted to men who had performed at least one chest CT scan (N=4804). A mortality study was also conducted. We used a Cox model with age as the time axis variable adjusted for smoking, time since first exposure, CEI of exposure to asbestos and pleural plaques on CT scans. Results: We reported a significant dose-response relationship between CEI of exposure to asbestos and head and neck cancers after exclusion of laryngeal cancers, in the mortality study (HR 1.03, 95% CI (1.01 to 1.06) for an increase of 10 f.years/mL) and a close to significant dose-response relationship in the incidence study (HR 1.02, 95% CI (1.00 to 1.04) for an increase of 10 f.years/mL). No statistically significant association between pleural plaques and head and neck cancer incidence was observed. Conclusions: This large-scale study suggests a relationship between asbestos exposure and head and neck cancers, after exclusion of laryngeal cancers, regardless of whether associated pleural plaques were present.

Fikretoglu D, Easterbrook B, and Nazarov A. Fidelity in workplace mental health intervention research: a narrative review. Work and Stress. 2022; 36(1):6-29.
https://doi.org/10.1080/02678373.2021.1936286

Go LHT, Green FHY, Abraham JL, Churg A, Petsonk EL, and Cohen RA. Coal mine dust lung disease in miners killed in the Upper Big Branch disaster: a review of lung pathology and contemporary respirable dust levels in underground US coal mines. Occupational & Environmental Medicine. 2022; 79(5):319-325.
https://doi.org/10.1136/oemed-2021-107694
Abstract: OBJECTIVES: In 2010, 29 coal miners died due to an explosion at the Upper Big Branch (UBB) mine in West Virginia, USA. Autopsy examinations of 24 individuals with evaluable lung tissue identified 17 considered to have coal workers' pneumoconiosis (CWP). The objectives of this study were to characterise histopathological findings of lung tissue from a sample of UBB fatalities and better understand the respirable dust concentrations experienced by these miners at UBB relative to other US coal mines. METHODS: Occupational pulmonary pathologists evaluated lung tissue specimens from UBB fatalities for the presence of features of pneumoconiosis. Respirable dust and quartz samples submitted for regulatory compliance from all US underground coal mines prior to the disaster were analysed. RESULTS: Families of seven UBB fatalities provided consent for the study. Histopathologic evidence of CWP was found in all seven cases. For the USA, central Appalachia and UBB, compliance dust samples showed the geometric mean for respirable dust was 0.468, 0.420 and 0.518 mg/m(3), respectively, and respirable quartz concentrations were 0.030, 0.038 and 0.061 mg/m(3). After adjusting for quartz concentrations, UBB exceeded the US permissible exposure limit (PEL) for respirable dust in 28% of samples. CONCLUSIONS: Although higher than average respirable dust and quartz levels were observed at UBB, over 200 US underground coal mines had higher dust concentrations than UBB and over 100 exceeded the PEL more frequently. Together with lung histopathological findings among UBB fatalities, these data suggest exposures leading to CWP in the USA are more prevalent than previously understood

Jacob L, Lopez-Sanchez GF, Oh H, Grabovac I, Stefanac S, Shin JI, et al. Association between back and neck pain and workplace absenteeism in the USA: the role played by walking, standing, and sitting difficulties. European Spine Journal. 2022; 31(4):926-934.
https://doi.org/10.1007/s00586-021-07084-9
Abstract: Purpose: There is a paucity of literature identifying factors that influence the back and neck pain (BNP)-workplace absenteeism relationship. Therefore, this study aimed to investigate the association between BNP and workplace absenteeism and potential mediating variables in a large sample of the US population. Methods: Nationally representative data collected in 2019 from the RAND American Life Panel (ALP) were used for this retrospective study. Workplace absenteeism was defined as the number of days of absence in the past 12 months for health-related reasons (count variable), while BNP corresponded to the presence

of back pain due to spinal stenosis, back pain due to other causes, or neck pain (dichotomous variable). Control variables included sex, age, ethnicity, marital status, education, occupation, annual family income, health insurance, obesity, and diabetes. There were eight influential variables (depression, anxiety, sleep disorder, alcohol dependence, opioid dependence, walking difficulty, standing difficulty, and sitting difficulty). The association between BNP and workplace absenteeism was analyzed using a negative binomial regression model. Results: There were 1,471 adults aged 22-83 years included in this study (52.9% of men; mean [standard deviation] age 44.5 [13.0] years). After adjusting for control variables, BNP was positively and significantly associated with workplace absenteeism (incidence rate ratio = 1.40, 95% confidence interval: 1.07-1.83). Walking, standing, and sitting difficulties individually explained between 24 and 43% of this association. Conclusions: Workplace interventions focusing on the management of BNP and overcoming difficulties in walking, standing, and sitting, potentially utilizing exercise, therapy, and ergonomic interventions, may prevent absenteeism.

Karpenko K, McEvoy M, Lewis LK, and Ferrar K. Schedules of standing and sitting directed by musculoskeletal discomfort in workers transitioning to sit-stand workstations: a cross-sectional study. Ergonomics. 2022; 65(4):618-630.
https://doi.org/10.1080/00140139.2021.1979253
Abstract: Sit-stand workstations are growing in popularity, however limited guidelines exist regarding optimal schedules of sitting and standing. This was the first known study to observe sit-stand workstation schedules when postural change is based on maintaining musculoskeletal discomfort within 'acceptable' levels. Fourteen healthy adults new to sit-stand workstations completed computer-based work at a sit-stand desk for half a workday. Participants changed between standing and sitting postures each time discomfort reached the maximum acceptable threshold. On average, the amount of standing and sitting was greatest in the first standing (median 40 minutes, interquartile range 40 minutes) and sitting (median 30 minutes, interquartile range 115 minutes) bouts. Average durations spent standing and sitting were lower in all consecutive bouts. Stand-sit ratios indicated an equal amount of standing to sitting or somewhat less standing. The schedules had substantial inter-participant variability. Future studies should consider that optimal schedules may vary with regard to time and be individual-specific.

Lee HE and Rhie J. Impact of long working hours and shift work on unmet health care need among Korean workers. Safety and Health at Work. 2022; 13(1):17-22.
https://doi.org/10.1016/j.shaw.2021.09.003 [open access]
Abstract: Background This study aimed to identify work-related risk factors, including long working hours and night/shift work, for unmet health care need using data of a representative panel of Korean adults. Methods Associations between work-related factors and unmet health care need were analyzed using data of 3,440 participants (10,320 observations) from the 2011-2013 Korean Health Panel Study. A generalized estimating

equation was used for the analysis of repeated measures. Results The prevalence of unmet health care was 16.6%. After adjusting sex, age, socioeconomic status, work characteristics, and working more than 60 hours per week (odds ratio [OR]: 1.43, 95% confidence interval [CI]: 1.23–1.65) or 50–59 hours per week (OR: 1.26, 95% CI: 1.08–1.46) instead of 40–49 hours per week and night/shift work (OR: 1.27, 95% CI: 1.06–1.51) were associated with unmet health care need. Conclusion Long working hours and night/shift work are risk factors for unmet health care need among the Korean working population.

Moosa MH and Oriet LP. Factors affecting safety performance in the construction industry: an empirical study using structural equation modelling. International Journal of Occupational Safety and Ergonomics. 2022; 28(2):779-789.
https://doi.org/10.1080/10803548.2021.1985302
Abstract: The Saudi construction industry is among the largest in the region - and, for workers, among the most dangerous industries. The importance of this study is assisting to reduce hazards, sources of risk and perceptions of safety in the construction sector. Using a quantitative survey measure administered to a small (n = 276) sample of individuals, this study aimed to contribute to empirical understandings of safety performance in this unique context. A multivariate safety performance model was developed to ensure compatibility with the structure of the survey measure. The survey data revealed a strong consensus expressing negative views of every safety dimension and variable tested, with only tiny minorities selecting positively valenced responses. To test the descriptive power of the model as a whole, a structural equation modelling technique was used to assess the correspondence between the relationships constituting the model and their significance relative to empirical data.

Mwanga HH, Baatjies R, Singh T, and Jeebhay MF. Work-related allergy and asthma associated with cleaning agents in health workers in Southern African tertiary hospitals. American Journal of Industrial Medicine. 2022; 65(5):382-395.
https://doi.org/10.1002/ajim.23344
Abstract: Background: Health workers (HWs) are exposed to diverse cleaning agents in large hospitals. This study determined the prevalence of work-related symptoms, allergic sensitization, and lung function abnormalities in HWs of two tertiary hospitals in Southern Africa. Methods: A cross-sectional study of 699 HWs (South Africa: SAH, n = 346; Tanzania: TAH, n = 353) was conducted. Health outcomes were assessed using a standardized ECRHS questionnaire, immunological tests (specific IgE antibody to common aero-allergens and to occupational allergens: natural rubber latex [NRL] Hev b5 and Hev b6.02, chlorhexidine, and ortho-phthalaldehyde [OPA]), spirometry [pre-and post- bronchodilator], methacholine challenge, and fractional exhaled nitric oxide (FeNO). Results: A large proportion of participants (78%) were women. Median age was 42 years, with 76% nurses, 12% cleaners, and 5% administrative workers. Current smoking was more common in SAHWs (12%) than TAHWs (1%). The overall prevalence of doctor-diagnosed asthma was 7%. Atopy was present

in 43% of HWs, while 4% were sensitized to OPA, 2% to NRL, and 1% to chlorhexidine. Prevalence of work-related ocular-nasal symptoms (16%) was higher than skin (12%) and chest (7%) symptoms. TAHWs had significantly lower mean lung volumes, higher degrees of significant airflow obstruction and impaired lung function. The prevalence of bronchial hyperresponsiveness in SAHWs (14%) was high. Overall, 23% of HWs had abnormal FeNO; 6% having high (>50 ppb) levels. FeNO was positively associated with sensitization to occupational allergens, primarily OPA and NRL. Conclusions: HWs from both hospitals had similar prevalence of work-related respiratory symptoms. Sensitization to OPA and NRL appears to be contributing to allergic airway inflammation in these HWs.

Ohlander J, Fuhrimann S, Basinas I, Cherrie JW, Galea KS, Povey AC, et al. Impact of occupational pesticide exposure assessment method on risk estimates for prostate cancer, non-Hodgkin's lymphoma and Parkinson's disease: results of three meta-analyses. Occupational & Environmental Medicine. 2022; [epub ahead of print].
https://doi.org/10.1136/oemed-2021-108046 [open access]
Abstract: Assessment of occupational pesticide exposure in epidemiological studies of chronic diseases is challenging. Biomonitoring of current pesticide levels might not correlate with past exposure relevant to disease aetiology, and indirect methods often rely on workers' imperfect recall of exposures, or job titles. We investigated how the applied exposure assessment method influenced risk estimates for some chronic diseases. In three meta-analyses the influence of exposure assessment method type on the summary risk ratio (sRR) of prostate cancer (PC) (25 articles), non-Hodgkin's lymphoma (NHL) (29 articles) and Parkinson's disease (PD) (32 articles) was investigated. Exposure assessment method types analysed were: group-level assessments (eg, job titles), self-reported exposures, expert-level assessments (eg, job-exposure matrices) and biomonitoring (eg, blood, urine). Additionally, sRRs were estimated by study design, publication year period and geographic location where the study was conducted. Exposure assessment method types were not associated with statistically significant different sRRs across any of the health outcomes. Heterogeneity in results varied from high in cancer studies to moderate and low in PD studies. Overall, case-control designs showed significantly higher sRR estimates than prospective cohort designs. Later NHL publications showed significantly higher sRR estimates than earlier. For PC, studies from North America showed significantly higher sRR estimates than studies from Europe. We conclude that exposure assessment method applied in studies of occupational exposure to pesticides appears not to have a significant effect on risk estimates for PC, NHL and PD. In systematic reviews of chronic health effects of occupational exposure to pesticides, epidemiological study design, publication year and geographic location, should primarily be considered

Sanchez-Rebull MV, Ninerola A, Ferrer-Rullan R, and Hernandez-Lara AB. Six Sigma for workplace safety improvement: improving hazards and unsafe conditions in a metallic packaging manufacturing company. International Journal of Occupational Safety and Ergonomics. 2022; 28(2):766-778.
https://doi.org/10.1080/10803548.2020.1829318
Abstract: Six Sigma has been applied as a business process improvement strategy in many companies worldwide with great results. On the other hand, workplace safety constitutes a key issue for company managers due to their responsibility. The aim of this article is to demonstrate how using Six Sigma can reduce accidents. A case study is conducted on a large European metallic packaging manufacturing company. As a result, the company presented a reduction of lost time accidents from 97 to 30 that saved a lot of time and cost. The σ value achieved was 4.24. This project shows the effectiveness of Six Sigma as an improvement tool in the human resources area, despite most of the previous Six Sigma research being focused on manufacturing aspects. The case studied can be useful either for large companies or small and medium-sized companies interested in improving safety

Stevelink SAM, Mark KM, Fear NT, Hotopf M, and Chalder T. Chronic fatigue syndrome and occupational status: a retrospective longitudinal study. Occupational Medicine. 2022; 72(3):177-183.
https://doi.org/10.1093/occmed/kqab170
Abstract: BACKGROUND: Few studies into chronic fatigue syndrome (CFS) have emphasized work-related consequences, including return to work after illness. AIMS: This paper explores socio-demographic, work and clinical characteristics that are associated with occupational status among patients who were assessed at baseline and a follow-up point. METHODS: Longitudinal data were assessed from patients affected by CFS who attended an outpatient CFS treatment service between 2007 and 2014. Employment status at baseline and follow-up was available for 316 patients. Data were also included on gender, age, duration of CFS, fatigue severity, type and number of treatment sessions, coping strategies, functional impairment, common mental disorders and physical functioning. RESULTS: Most patients were female (73%) and had been affected by CFS for longer than 2 years (66%). Patients were followed up for an average of 285 days and over this period 53% of patients who were working remained in employment. Of the patients who were not working at baseline, 9% had returned to work at follow-up. However, of those working at baseline, 6% were unable to continue to work at follow-up. Age, fatigue severity, functional impairment, cognitive and behavioural responses, and depressive symptoms impacted on a patients' work status at follow-up. CONCLUSIONS: The findings indicated that it is possible for people with CFS to remain in work or return to work, despite having had a disabling illness. Work-related outcomes should be targeted in all people of working age

Takada H, Ae R, Ogawa M, and Kagomoto T. Depression prevention in healthcare workers during the COVID-19 pandemic. Occupational Medicine. 2022; 72(3):207-214.

https://doi.org/10.1093/occmed/kqab192 **[open access]**

Abstract: BACKGROUND: Few studies have assessed depression in healthcare workers (HCWs) in Japan owing to the coronavirus disease 2019 (COVID-19) pandemic, and no studies have proposed effective interventions to help support their mental health. AIMS: To test the hypothesis that enhancing access to mental healthcare professionals helps to improve HCWs' mental health. METHODS: This cross-sectional study assessed depressive symptoms in HCWs at three hospitals in Osaka prefecture between May and July, 2020. The survey obtained information on HCWs' mental state and related situations/perceptions. Multivariable logistic regression analysis was performed to identify factors associated with depressive symptoms. RESULTS: Of the 3291 eligible HCWs, 1269 (39%) completed the survey. Of all HCWs, 87 (7%) were physicians, and 700 (55%) were nurses. A total of 181 (14%) HCWs had moderate-to-severe symptoms of depression. Being a frontline worker was not significantly associated with depressive symptoms (odds ratio: 0.86 [95% confidence intervals: 0.54-1.37], P = 0.50). The unwillingness to consult with anyone was significantly associated with more severe depressive symptoms (1.70 [1.10-2.63], P < 0.01). HCWs who had no opportunity to confide in family/friends (1.66 [1.10-2.52], P < 0.01) or colleagues/supervisors (3.19 [2.22-4.58], P < 0.001) were significantly more likely to have depressive symptoms. CONCLUSIONS: Being a frontline HCW in a Japanese hospital treating patients with COVID-19 was not significantly associated with having depressive symptoms. The study highlights that encouraging daily communication with close persons (family, friends, colleagues and supervisors), rather than improving access to mental health professionals, might help to prevent depression in HCWs during the COVID-19 pandemic

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