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.

Austigard AD, Smedbold HT, and von Hirsch Svendsen K. Comparison of 3 methods characterizing H2S exposure in water and wastewater management work. Annals of Work Exposures and Health. 2024; 68(7):725-736.
https://doi.org/10.1093/annweh/wxae043 [open access]
Abstract: This study evaluates the effectiveness of self-assessed exposure (SAE) data collection for characterization of hydrogen sulfide (H2S) risks in water and wastewater management, challenging the adequacy of traditional random or campaign sampling strategies. We compared 3 datasets derived from distinct strategies: expert data with activity metadata (A), SAE without metadata (B), and SAE with logbook metadata (C). The findings reveal that standard practices of random sampling (dataset A) fail to capture the sporadic nature of H2S exposure. Instead, SAE methods enhanced by logbook metadata and supported by reliable detection and calibration infrastructure (datasets B and C) are more effective. When assessing risk, particularly peak exposure risks, it is crucial to adopt measures that capture exposure variability, such as the range and standard deviations. This finer assessment is vital where high H2S peaks occur in confined spaces. Risk assessment should incorporate indices that account for peak exposure, utilizing variability measures like range and standard or geometric standard deviation to reflect the actual risk more accurately. For large datasets, a histogram is just as useful as statistical measures. This approach has revealed that not only wastewater workers but also water distribution network workers, can face unexpectedly high H2S levels when accessing confined underground spaces. Our research underscores the need for continuous monitoring with personal electrochemical gas detector alarm systems, particularly in environments with variable and potentially hazardous exposure levels

Berge LAM, Shala NK, Barone-Adesi F, Hosgood HD, Samuelsen SO, Bratveit M, et al. Exposure to fibres and risk of pleural mesothelioma in the Norwegian Offshore Petroleum Workers cohort. Occupational and Environmental Medicine. 2024; 81(7):331-338.
https://doi.org/10.1136/oemed-2024-109424
Abstract: Objectives: Pleural mesothelioma is a rare respiratory cancer, mainly caused by inhalation of asbestos fibres. Other inorganic fibres are also suggested risk factors. We aimed to investigate the association between exposure to asbestos or refractory ceramic fibres (RCFs) and pleural mesothelioma among male Norwegian offshore petroleum workers. Methods: Among 25 347 men in the Norwegian Offshore Petroleum Workers (NOPW) cohort (1965-1998), 43 pleural mesothelioma cases were identified through the Cancer Registry of Norway (1999-2022). A case-cohort study was conducted with 2095 randomly drawn non-cases from the cohort. Asbestos and RCF exposures were assessed with expert-made job-exposure matrices (JEMs). Weighted Cox regression was used to estimate HRs and 95% CIs, adjusted for age at baseline and pre-offshore employment with likely asbestos exposure. Results: An increased risk of pleural mesothelioma was indicated for the highest versus lowest tertile of average intensity of asbestos (HR=1.21, 95% CI: 0.57 to 2.54). Pre-offshore asbestos exposure (vs no such exposure) was associated with increased risk of pleural mesothelioma (HR=2.06, 95% CI: 1.11 to 3.81). For offshore workers with no pre-offshore asbestos exposure, an increased risk of pleural mesothelioma was found for the highest tertile of average intensity of asbestos (HR=4.13, 95% CI: 0.93 to 18), versus the lowest tertile. No associations were found between RCF and pleural mesothelioma. Conclusions: Associations between JEM-based offshore asbestos exposure and pleural mesothelioma were confirmed in the NOPW cohort. Pleural mesothelioma risk was also associated with asbestos exposure before work in the offshore petroleum industry.

Bertilsson M, Niederberger R, and De Rijk A. Work accommodations for employees with common mental disorders and associated manager-related determinants: a cross-sectional study among Swedish managers. Disability and Rehabilitation. 2024; 46(18):4256-4275.
https://doi.org/10.1080/09638288.2023.2269861
Abstract: PURPOSE: To investigate frequencies of managers' reported use of work accommodations (WAs) for employees with common mental disorders (CMD), and to examine associations between manager-related characteristics and the use of diverse WAs. MATERIAL AND METHODS: 3358 managers took part in a web-survey, of these, 1779 were included in this study. The survey listed 15 WAs grouped into seven types using principal component analysis. The relationships between managers' person-related, knowledge-related, and work-related characteristics with the seven WAs were tested with multivariate logistic regression analyses. RESULTS: Reported use of WAs was high. Compared to work-related characteristics, person-related and knowledge-related characteristics were stronger associated with WAs. The two characteristics associated with most WAs types were (1) confidence in supporting employees with CMD (5 WA types) and (2) managerial training on CMD (4 WA types). CONCLUSION: Managers report an extensive use of different types of WAs. WAs were related to a variety of determinants, depending on the WA type, but using WAs depends on the manager as an individual rather than on their work environment. To increase equal access to WAs, organizations should encourage managers to use WAs in order to support and improve the work capacity for employees with CMD

Deng KQ, Chen XY, Yuan XM, Ren YR, Luo ZM, Li GY, et al. The effect of nurses' perceived stress on their work engagement and perceived professional benefit during the routine management of the COVID-19 pandemic. Work. 2024; 78(4):873-881.
https://doi.org/10.3233/WOR-220498
Abstract: Background: In a previous study, more attention has been given to the psychological state of doctors than to that of nurses although the workload, working hours, and patient contact time are generally higher for nurses than doctors. The current status of nurses' perceived stress, work engagement, and perceived professional benefit during the routine management of the Coronavirus disease 2019 (COVID-19) pandemic and how their perceived stress affects the other two variables are topics that merit research attention. Objective: In this study, the status of nurses' perceived stress, work engagement, and perceived professional benefit during the routine management of the COVID-19 pandemic was investigated to explore whether their perceived stress level has any effect on the other two variables. Methods: The convenience sampling method was adopted, and 669 nurses from the First People's Hospital of Jingzhou were selected to participate in this study. Questionnaires on perceived stress, work engagement, and perceived professional benefit were used in the survey, and the data were processed using the SPSS 20.0 program for the descriptive statistics, independent sample t-test, analysis of variance. Results: The total score of the nurses' perceived stress was 18.58±4.37 points. The total scores of their work engagement (43.32±14.01) and perceived professional benefit (140.23±17.75). Conclusion: The nurses' total perceived stress score was at an upper-middle level, and their total work engagement and perceived professional benefit scores were relatively high. Overall, perceived stress has a negative effect on nurses' work engagement and perceived professional benefit. That is, the higher the pressure perception of nurses, the lower the degree of work engagement and perceived professional benefit.

Everest L, Tan S, Navaneelan T, Demers PA, DeBono N, Berriault C, et al. Comparison of internal and external reference populations for occupational cancer surveillance in a cohort drawn from a diverse workforce. American Journal of Industrial Medicine. 2024; 67(9):865-873.
https://doi.org/10.1002/ajim.23637
Abstract: OBJECTIVES: Prior analyses of the Occupational Disease Surveillance System (ODSS) have compared cancer rates using internal referent groups. As an exploratory analysis, we sought to estimate cancer risk using general population reference rates to evaluate the impact that the comparison population has on findings from our surveillance program. METHODS: A cohort of approximately 2.3 million workers in Ontario, Canada with an accepted lost-time workers' compensation claim were followed for all cancer diagnoses between 1983 and 2018. Standardized incidence ratios (SIRs) and 95% confidence intervals were calculated for workers in specific occupational groups using (1) all other workers in the ODSS cohort, and (2) the general population of Ontario. RESULTS: SIRs using the general population reference group were generally equal to or modestly lower compared to SIRs using the internal reference group. Within occupation groups, SIRs had a discordant direction of association (increased rate in the internal comparison and decreased in the external comparison) for some cancer sites including urinary, prostate, and colorectal. CONCLUSIONS: Findings emphasize the importance of the choice of reference group when evaluating cancer risks in large occupational surveillance cohorts. Importantly, the magnitude of confounding and the healthy worker hire bias may depend on the occupation group and cancer site of interest

Isingizwe J, Eiris R, and Jalil Al-Bayati A. Enhancing safety training engagement through immersive storytelling: a case study in the residential construction. Safety Science. 2024; 179:106631.
https://doi.org/10.1016/j.ssci.2024.106631

Kim JH and Choi S. Effects of post-COVID-19 syndrome on quality of life among airline crew. Workplace Health & Safety. 2024; 72(9):374-383.
https://doi.org/10.1177/21650799241253870
Abstract: Background: Interest in post-coronavirus disease 2019 (COVID-19) syndrome following COVID-19 infection has been increasing. Maintaining quality of life (QoL) is vital for airline crews because they work in a special environment, where they are responsible for the passengers' safety. This study aims to closely investigate factors affecting the QoL of airline crews, including post-COVID-19 syndrome. Methods: This study was designed as a cross-sectional survey, comprising 167 crews. Findings: Age-specific significant differences were observed in social, overall, and total QoL scores. The physical domain QoL was significantly higher in the cockpit crews than that in the cabin crews. Significant differences were found in psychological and overall QoL depending on years of continuous service. Social domain and environmental QoL were lower in those who had no symptoms after being diagnosed with COVID-19 than in those who were symptomatic. Among the participants, 4.2% had post-COVID-19 syndrome, indicating significant differences in the physical domain, depending on whether they exhibit post-COVID-19 syndrome. Conclusion: It is urgent to develop measures to increase the QoL of airline crews, investigate post-COVID-19 syndrome before returning to work, and develop strategies to manage it. Application to practice: The QoL among airline crews differed not only by the demographic characteristics of the participants but also by the presence of symptoms during COVID-19 diagnosis and post-COVID-19 syndrome. Higher QoL among airline crews is associated with the safety of both airline crews and passengers. Therefore, it is necessary to establish a systematic management protocol for airline crews returning to work after following COVID-19 infection

Kuzu Durmaz A, Cicekoglu Ozturk P, and Cevik Durmaz Y. Work stress and obsessive-compulsive symptoms in nurses and office workers: a comparative study. International Journal of Occupational Safety & Ergonomics. 2024; 30(3):711-716.
https://doi.org/10.1080/10803548.2024.2335029
Abstract: Objectives. This study aims to compare the work stress and obsessive-compulsive symptoms of nurses and office workers and to determine the relationship between work stress and obsessive-compulsive symptoms. Methods. A total of 127 nurses and 127 office workers participated in the cross-sectional study and comparative study. Data were collected using the perceived work stress scale and the Maudsley obsessive-compulsive inventory. Results. Nurses had higher work stress scores ($p = 0.003$) in general than office workers. In particular, nurses with a low ($p < 0.039$) and average ($p < 0.007$) economic status, nurses who had been employed for 1-10 years ($p < 0.001$) and nurses working 40 h per week ($p < 0.042$) had higher work stress scores than office workers. There was no difference ($p > 0.05$) between obsessive-compulsive symptom scores. There was a positive significant relationship ($p < 0.001$) between work stress and obsessive-compulsive symptom scores of nurses and office workers. Work stress explains 6.1% of the obsessive-compulsive symptoms in nurses and 12.4% in office workers. Conclusion. The results of this study concluded that work stress of nurses

is higher than that of office workers and work stress affects the obsessive-compulsive symptoms in both groups.

Landon TJ, Phillips BN, McKnight M, Sabella SA, and Kline KM. The impact of organizational factors and professional identity on turn over intent in state vocational rehabilitation agencies. Rehabilitation Counseling Bulletin. 2024; 67(4):269-282.
https://doi.org/10.1177/00343552231155215

Martin CL, Richardson D, Richey M, Nocera M, Cantrell J, McClure ES, et al. Twenty-five year occupational homicide mortality trends in North Carolina: 1992-2017. Injury Prevention. 2024; 30:283-289.
https://doi.org/10.1136/ip-2023-044991
Abstract: Introduction Determining industry of decedents and victim–perpetrator relationships is crucial to inform and evaluate occupational homicide prevention strategies. In this study, we examine occupational homicide rates in North Carolina (NC) by victim characteristics, industry and victim–perpetrator relationship from 1992 to 2017. Methods Occupational homicides were identified from records of the NC Office of the Chief Medical Examiner system and the NC death certificates. Sex, age, race, ethnicity, class of worker, manner of death, victim–perpetrator relationship and industry were abstracted. Crude and age-standardised homicide rates were calculated as the number of homicides that occurred at work divided by an estimate of worker-years (w-y). Rate ratios and 95% CIs were calculated, and trends over calendar time in occupational homicide rates were examined overall and by industry. Results 456 homicides over 111 573 049 w-y were observed. Occupational homicide rates decreased from 0.82 per 100 000 w-y for the period 1992–1995 to 0.21 per 100 000 w-y for the period 2011–2015, but increased to 0.32 per 100 000 w-y in the period 2016–2017. Fifty-five per cent (252) of homicides were perpetrated by strangers. Taxi drivers experienced an occupational homicide rate that was 110 times (95% CI 76.52 to 160.19) the overall occupational homicide rate in NC; however, this rate declined by 76.5% between 1992 and 2017. Disparities were observed among workers 65+ years old, racially and ethnically minoritised workers and self-employed workers. Conclusion Our findings identify industries and worker demographics that experienced high occupational homicide fatality rates. Targeted and tailored mitigation strategies among vulnerable industries and workers are recommended.

Moreira-Silva I, Seixas A, Mota J, Cardoso R, and Azevedo J. Associations between day and night-shifts, work-related musculoskeletal symptoms and absenteeism in the manufacturing industry. International Journal of Occupational Safety & Ergonomics. 2024; 30(3):867-871.
https://doi.org/10.1080/10803548.2024.2358679
Abstract: Objectives. Associations between shift-work, musculoskeletal symptoms and absenteeism are poorly investigated in the manufacturing industry. This study aimed to investigate associations between working schedule, musculoskeletal symptoms and days of absenteeism among pulp and paper industry workers. Methods. Musculoskeletal symptoms of 904 workers were assessed through the Nordic Musculoskeletal Questionnaire. ?2 tests assessed associations between being a day-worker or shift-worker, the prevalence of musculoskeletal symptoms and days of absenteeism. Results. A significant association was found between working schedule and symptoms in the lower back in the last 12 months, with shift-workers presenting higher prevalence than day-workers (p = 0.022). Significant associations were also found between days of absenteeism and symptoms in the shoulders

(p = 0.002), which mostly led to absenteeism of 100-365 days; elbows (p < 0.001), wrists/hands (p = 0.045) and ankles/feet (p = 0.042), which produced absenteeism mostly of 25-99 days; and dorsal region (p = 0.001), which mainly led to absenteeism of 10-24 days. No associations were found between working schedule and days of absenteeism (p = 0.265). Conclusion. Shift-work is associated with increased prevalence of lower back symptoms, but seems not to influence days of absenteeism. Shoulders seem to be the region leading to higher days of absenteeism, followed by elbows, wrists/hands, ankles/feet and the dorsal region.

de Pedro-Jimenez D, de Diego-Cordero R, Vargas-Martinez AM, Raya-Cano E, Molina-Luque R, and Romero-Saldana M. Physical inactivity increases impairment of daily activities due to pain in workers: an ordinal regression logistic and correspondence analysis. Workplace Health & Safety. 2024; 72(9):384-391.
https://doi.org/10.1177/21650799241259148
Abstract: Background: The evidence for the health benefits of physical activity is growing; however, the prevalence of unhealthy lifestyles continues to contribute to the increase in chronic non-communicable diseases. We know that occupational-time physical activity does not provide the same benefits as leisure-time physical activity, which has been shown to reduce mortality and pain. We also know that multiple factors influence pain; however, there are no studies that specifically analyze the impact of type of working time and occupational-time physical activity on the impairment of daily activities due to pain. We aimed to study the influence of both personal and occupational factors on the impairment of daily activities due to pain, assessing whether leisure-time physical activity acts as a protective factor. Methods: A cross-sectional, population-based design was used based on the 2017 National Health Survey in Spain (ENSE). Sociodemographic, leisure-time physical activity, and work-related variables were collected. The outcome variable was the impairment of daily activities due to pain. Ordinal logistic regression was applied, and the analysis was complemented with simple correspondence analysis. Results: A total of 1,441 workers between 18 and 65 years of age were studied. Significant differences were found between sexes for all variables except age and leisure-time physical activity. Logistic regression revealed significant associations between sex, primary and secondary education levels, no leisure-time physical activity, and overweight with impairment of daily activities due to pain. Simple correspondence analysis showed that the categories doing leisure-time physical activity several times a week as well as several times a month are closer to the categories of little or no pain. Conclusion: Female gender, low educational level, overweight, and lack of leisure-time physical activity were associated with increases in impairment of daily activities due to pain. Occupational-time physical activity and work shift were not related to impairment of daily activities due to pain. Implications for Occupational Health Practice: Occupational Health Nursing interventions through education and counseling on the importance of leisure-time physical activity promotion programs potentially can reduce the impairment of daily activities due to pain in working populations

Restuputri DP, Amalia F, Masudin I, and Widayat. The influence of industry 4.0, internet of things, and physical-cyber systems on human factors: a case study of workers in Indonesian oil and gas refineries. Theoretical Issues in Ergonomics Science. 2024; 25(5):567-592.
https://doi.org/10.1080/1463922X.2023.2284295

Tiwa Diffo E, Lavigne-Robichaud M, Milot A, Brisson C, Gilbert-Ouimet M, Vezina M, et al. Psychosocial stressors at work and atrial fibrillation incidence: an 18-year prospective study. Journal of the American Heart Association. 2024; 13(16):e032414.
https://doi.org/10.1161/JAHA.123.032414 **[open access]**
Abstract: Background: Psychosocial stressors at work, defined by the job strain and effort-reward imbalance at work (ERI) models, were shown to increase coronary heart disease risk. No previous study has examined the adverse effect of psychosocial stressors at work from both models on atrial fibrillation (AF) incidence. The objective of this study was to examine the separate and combined effect of psychosocial stressors at work from the job strain and ERI models on AF incidence in a prospective cohort study. Methods and results: A total of 5926 white-collar workers (3021 women and 2905 men) free of cardiovascular disease at baseline were followed for an average of 18 years. Job strain (high psychological demands combined with low decision latitude) and ERI were assessed using validated instruments. AF events were identified in medical databases with universal coverage. Hazard ratios (HRs) with 95% CIs were estimated using Cox regression models, controlling for socioeconomic characteristics and lifestyle-related and clinical risk factors. A total of 186 AF incident events were identified over 18 years. Workers exposed to job strain (HR, 1.83 [95% CI, 1.14-2.92]) and ERI (HR, 1.44 [95% CI, 1.05-1.98]) had a higher risk of AF in fully adjusted models. Combined exposure to job strain and ERI was associated with a 2-fold AF risk increase (HR, 1.97 [95% CI, 1.26-3.07]). Conclusions: Psychosocial stressors at work from the job strain and ERI models are associated with an increased risk of AF, separately and in combination. Workplace prevention strategies targeting these psychosocial stressors at work may be effective to reduce the burden associated with AF.

Xia T, Li J, and Chen L. Association of occupational and leisure-time physical activity with allostatic load. American Journal of Preventive Medicine. 2024; 67(3):328-338.
S:\0_Library Catalogue\e-publications\54203.pdf
Ref ID: 54203
https://doi.org/10.1016/j.amepre.2024.04.009
Abstract: INTRODUCTION: Leisure-time physical activity decreases allostatic load, a measure of burden of chronic stress. However, the role of occupational physical activity is unknown. This study examined associations of occupational physical activity and leisure-time physical activity with allostatic load among workers in the U.S. METHODS: This cross-sectional study included 6,944 U.S. workers aged 20-64 years from the National Health and Nutrition Examination Survey (2007-2018). Physical activity was assessed using the Global Physical Activity Questionnaire. Allostatic load was calculated using biomarkers of cardiovascular, metabolic, and immune systems. Associations of occupational physical activity and leisure-time physical activity with allostatic load were examined using negative binomial regressions. Analyses were conducted between August 2022 and March 2023. RESULTS: Vigorous leisure-time physical activity inversely associated with allostatic load among all workers (count ratio=0.68, 95% CI=0.62, 0.76) and in each sex- and age-stratified group as well as in each race/ethnicity-stratified group. Vigorous occupational physical activity positively associated with allostatic load only among females aged 20-44 years (1.38, 95% CI=1.10, 1.73). Inverse associations of vigorous leisure-time physical activity with allostatic load were similar in young females with high or low vigorous occupational physical activity. CONCLUSIONS: Increasing vigorous leisure-time physical activity associates with a lower allostatic load for all workers, whereas increasing vigorous occupational physical activity associates with a higher allostatic load only in young females. Promoting

vigorous leisure-time physical activity reduces allostatic load among young females with either low or high vigorous occupational physical activity

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