

IWH Research Alert
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Andersen LL, Vinstrup J, Sundstrup E, Skovlund SV, Villadsen E, and Thorsen SV. Combined ergonomic exposures and development of musculoskeletal pain in the general working population: a prospective cohort study. *Scandinavian Journal of Work, Environment & Health*. 2021; [epub ahead of print].

<https://doi.org/10.5271/sjweh.3954>

Abstract: Objective This study aimed to investigate the importance of combined ergonomic exposures at work for the development of musculoskeletal pain. Methods Through four rounds (2012-2018) of the Work Environment and Health in Denmark Study, 18 905 employees of the general working population replied to a baseline and 2-year follow-up questionnaire. First, a k-means cluster analysis of seven ergonomic factors (back bending, arm above shoulders, lifting etc., from 'never' to 'almost all the time') identified nine naturally occurring clusters. Second, using a weighted survey regression model controlling for age, gender, survey year, education, lifestyle, influence at work, and pain intensity at baseline, we estimated development of pain intensity (0-10) in the neck-shoulder and low-back in these clusters. The largest cluster served as reference to the other clusters and was characterized by low ergonomic exposures. Results Clusters characterized by multiple combined ergonomic exposures for a relatively high percentage of the working time



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showed the largest increase in neck-shoulder as well as low-back pain intensity from baseline to follow-up. However, clusters characterized by high exposure to a few specific ergonomic factors also increased pain significantly, eg, standing/walking combined with lifting/carrying or twisted/bent back for the majority of the working time increased low-back pain, whereas repetitive arm movements for the majority of the working time with or without standing/walking increased neck-shoulder pain. Conclusion Combined occupational ergonomic exposures play an important role in the development of musculoskeletal pain. Workplace preventive approaches should consider this in risk assessments and organization of the work

Battista EB, Yedulla NR, Koolmees DS, Montgomery ZA, Ravi K, and Day CS. Manufacturing workers have a higher incidence of carpal tunnel syndrome. Journal of Occupational & Environmental Medicine. 2021; 63(3):e120-e126.

<https://doi.org/10.1097/JOM.0000000000002122>

Abstract: Objective: It is unclear whether clerical or labor-type work is more associated with risk for developing work-related carpal tunnel syndrome (WrCTS). Methods: National employment, demographic, and injury data were examined from the Bureau of Labor Statistics databases for the years 2003 to 2018. Injuries for clerical and labor industries were compared using linear regression, two-group t test, and one-way analysis of variance (ANOVA) analysis. Results: WrCTS injuries are decreasing over time ($B = -1002.62$, $P < 0.001$). The labor industry demonstrated a significantly higher incidence of WrCTS when compared with the clerical industries ($P < 0.001$). Within labor industries, the manufacturing industry had the highest incidence of WrCTS over time ($P < 0.001$). Conclusions: Our study showed WrCTS injuries have declined over time. Additionally, our findings may suggest that the labor industry has a stronger association with WrCTS than the clerical industry.

Beland D, Cantillon B, Hick R, and Moreira A. Social policy in the face of a global pandemic: policy responses to the COVID-19 crisis. Social Policy & Administration. 2021; 55(2):249-260.

<https://doi.org/10.1111/spol.12718> [open access]

Abstract: How have welfare states responded to the coronavirus pandemic? In this introductory article, we provide a synopsis of



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papers that comprise this special issue on social policy responses to COVID-19, an overview of some of the key questions they raise, and some provisional answers to these questions. Our conclusions are threefold: first, these social policy responses, while entailing new developments in many countries, nonetheless reflect, at least in part, existing national policy legacies. Second, these responses can be understood as a form of "emergency Keynesianism," which is characterized by the massive use of deficit spending during economic crises, with the aim of supporting rather than challenging core capitalist institutions. Third, there are clear differences in terms of the nature of the reforms enacted during the initial phase of the COVID-19 crisis as compared to reforms enacted as a response to the 2008 financial crisis.

Boulagouas W, Garcia-Herrero S, Chaib R, Herrera Garcia S, and Djebabra M. On the contribution to the alignment during an organizational change: measurement of job satisfaction with working conditions. Journal of Safety Research. 2021; 76:289-300.

<https://doi.org/10.1016/j.jsr.2020.12.006>

Abstract: INTRODUCTION: Modern approaches to Occupational Health and Safety have acknowledged the important contribution that continuous improvements to working conditions can make to the motivation of employees, their subsequent performance, and therefore to the competitiveness of the company. Despite this fact, organizational change initiatives represent a path less traveled by employees. Specialized literature has drawn on the fact that employees' satisfaction presents both the foundation and catalyst for effective implementation of improvements to working conditions. METHOD: This paper conceptualizes the alignment of employees through measurement of job satisfaction and uses the Bayesian Network to assess the influence of human factors, particularly the cognitive, emotional, and behavioral aspects. Toward this aim, the Bayesian Network is evaluated through a cross-validation process, and a sensitivity analysis is then conducted for each influential dimension: emotional, cognitive, and behavioral. RESULTS: The results reveal that these three dimensions are interrelated and have a direct influence on job satisfaction and employees' alignment during the organization change. Further, they suggest that the best strategy



for enhanced alignment and smooth conduct of organizational changes is simultaneous enhancement of the three dimensions. Practical applications: This study shows the influence of emotional, cognitive, and behavioral dimensions on job satisfaction and employees' alignment during the organizational change. Furthermore, it elaborates the way to develop efficient and effective strategies for a successful change implementation and sustained alignment

Buller DB, Walkosz BJ, Olivas S, Eye R, Liu X, Kinsey A, et al. Association of occupational sun safety policy and actions in state transportation sector in the United States. American Journal of Industrial Medicine. 2021; 64(4):274-282.

<https://doi.org/10.1002/ajim.23214>

Abstract: Background: Occupational sun protection is recommended by government health authorities. Sun safety policies and predictors of managers' reports of sun safety actions were assessed. Methods: Written policies from 21 state departments of transportation (DOTs) enrolled in a randomized trial to test methods for scaling-up an occupational sun safety intervention were coded for sun safety content at baseline. Managers (n = 1113) supervising outdoor workers reported on sun safety actions in a baseline survey. Results: Twenty state DOTs (95.2%) have a policy with at least one sun protection component. Sun safety training was increased at workplaces with a written sun safety policy ($p < 0.001$) and unwritten standard procedures on sun protection ($p < 0.001$). Reported sun safety actions were highest where there was a written sun safety policy ($p < 0.001$) and unwritten standard procedures on sun protection ($p < 0.001$). Conclusions: Policies are essential for the implementation of employee sun safety. There is room for improvement in existing policies of state DOTs.

Carlsten C, Gulati M, Hines S, Rose C, Scott K, Tarlo SM, et al. COVID-19 as an occupational disease. American Journal of Industrial Medicine. 2021; 64(4):227-237.

<https://doi.org/10.1002/ajim.23222> [open access]

Abstract: The impact of coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 permeates all aspects of society worldwide. Initial medical reports and media coverage have increased awareness of the risk imposed



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on healthcare workers in particular, during this pandemic. However, the health implications of COVID-19 for the global workforce are multifaceted and complex, warranting careful reflection and consideration to mitigate the adverse effects on workers worldwide. Accordingly, our review offers a framework for considering this topic, highlighting key issues, with the aim to prompt and inform action, including research, to minimize the occupational hazards imposed by this ongoing challenge. We address respiratory disease as a primary concern, while recognizing the multisystem spectrum of COVID-19-related disease and how clinical aspects are interwoven with broader socioeconomic forces

Guha N, Bouaoun L, Kromhout H, Vermeulen R, Bruning T, Behrens T, et al. Lung cancer risk in painters: results from the SYNERGY pooled case-control study consortium. Occupational and Environmental Medicine. 2021; 78(4):269-278.

<https://doi.org/10.1136/oemed-2020-106770> [open access]

Abstract: OBJECTIVES: We evaluated the risk of lung cancer associated with ever working as a painter, duration of employment and type of painter by histological subtype as well as joint effects with smoking, within the SYNERGY project. METHODS: Data were pooled from 16 participating case-control studies conducted internationally. Detailed individual occupational and smoking histories were available for 19 369 lung cancer cases (684 ever employed as painters) and 23 674 age-matched and sex-matched controls (532 painters). Multivariable unconditional logistic regression models were adjusted for age, sex, centre, cigarette pack-years, time-since-smoking cessation and lifetime work in other jobs that entailed exposure to lung carcinogens. RESULTS: Ever having worked as a painter was associated with an increased risk of lung cancer in men (OR 1.30; 95% CI 1.13 to 1.50). The association was strongest for construction and repair painters and the risk was elevated for all histological subtypes, although more evident for small cell and squamous cell lung cancer than for adenocarcinoma and large cell carcinoma. There was evidence of interaction on the additive scale between smoking and employment as a painter (relative excess risk due to interaction >0). CONCLUSIONS: Our results by type/industry of painter may aid future identification of causative agents or



exposure scenarios to develop evidence-based practices for reducing harmful exposures in painters

Hodzic S, Kubicek B, Uhlig L, and Korunka C. Activity-based flexible offices: effects on work-related outcomes in a longitudinal study. *Ergonomics*. 2021; 64(4):455-473.

<https://doi.org/10.1080/00140139.2020.1850882>

Abstract: A recent popular trend in office re-design is the activity-based flexible office (A-FO). Initially, assumptions about the effects of A-FOs were drawn from research into open-plan offices where lack of privacy, concentration opportunities, and an increase in distractions are identified as main downsides. These aspects have not been explored sufficiently in the context of A-FOs. Using a longitudinal within-subjects design with three measurement times, we focussed on analysing the change in distraction after moving to an A-FO, how distraction-affected important work-related outcomes, and what factors moderated these relationships. Results showed that moving to the A-FO had negative effects on distraction, work engagement, job satisfaction, and fatigue. The negative effects of distraction were more pronounced in situations of increased time pressure and unpredictability. The obtained results highlight the harmful effects of the interaction of work stressors for employees' motivation and well-being. Practitioner summary: The results of our research provide important insight into how moving to an activity-based flexible office impacts the employees. Besides having quiet zones for concentrated work to avoid distractions managers and leaders should also focus on taking care of work stressors to avoid fatigue and loss of motivation

Igboanugo S, Bigelow PL, and Mielke JG. Health outcomes of psychosocial stress within firefighters: a systematic review of the research landscape. *Journal of Occupational Health*. 2021; 63(1):e12219.

<https://doi.org/10.1002/1348-9585.12219> [open access]

Abstract: BACKGROUND AND OBJECTIVES: Much of the research surrounding firefighter health has concerned the hazards intuitively associated with the occupation, such as physical, thermal, and chemical risks. However, an additional aspect of their work environment, psychosocial stressors, has begun to attract a growing level of attention. Work-related psychosocial stress may best be



described as mental and emotional strain caused by a combination of workplace events and characteristics, and the objective of our review was to identify the health outcomes associated with these stressors in firefighters. METHODS: A systematic review was performed of studies reporting on the psychosocial stressors and the associated health outcomes experienced by firefighters. Data sources included the MEDLINE, PsychInfo, and CINAHL databases. RESULTS: Twenty-nine studies met the inclusion criteria. Upon analysis, we found that firefighters experienced a range of psychosocial stressors (including interpersonal conflict and concerns over organizational fairness) and observed that these stressors were associated with a number of health-related outcomes that could be arranged into six areas: depression-suicidality, non-depressive mental health problems, burnout, alcohol use disorders, sleep quality, and physiological parameters and somatic disorders. CONCLUSION: Our findings strongly suggest that work-related psychosocial stressors can affect the health and well-being of those in the fire service, and highlight that interventions meant to address these psychosocial risk factors should focus upon promoting self-esteem, enhancing self-efficacy, and strengthening social support

Jones A, Blake J, Adams M, Kelly D, Mannion R, and Maben J. Interventions promoting employee "speaking-up" within healthcare workplaces: a systematic narrative review of the international literature. Health Policy. 2021; 125(3):375-384. <https://doi.org/10.1016/j.healthpol.2020.12.016>

Abstract: BACKGROUND: Healthcare systems worldwide increasingly value the contribution of employee voice in ensuring the quality of patient care. Although employees' concerns are often dealt with satisfactorily, considerable evidence suggests that some employees may feel unable to speak-up, and even when they do their concerns may be ignored. As a result, in addition to trans-national and national policies, workplace interventions that support employees to speak-up about their concerns have recently increased. METHODS: A systematic narrative review, informed by complex systems perspectives addresses the question: "What workplace strategies and/or interventions have been implemented to promote speaking-up by employees"? RESULTS: Thirty-four studies were included in the review. Most studies reported inconclusive results.



Researchers explanations for the successful implementation, or otherwise, of speak-up interventions were synthesised into two narrative themes (Braithwaite et al., 2018 (a)) hierarchical, interdisciplinary and cultural relationships and (Francis, 2015 (b)) psychological safety. CONCLUSIONS: We strengthen the existing evidence base by providing an in-depth critique of the complex system factors influencing the implementation of speak-up interventions within the healthcare workforce. Although many of the studies were locally unique, there were international similarities in workplace cultures and norms that created contexts inimical to speaking-up interventions. Changing communication behaviours and creating a climate that supports speaking-up is immensely challenging. Interventions can be usurped in practice by complex, emergent and contextual issues, such as pre-existing socio-cultural relationships and workplace hierarchies

Lilley R, Maclennan B, McNoe BM, Davie G, Horsburgh S, and Driscoll T. Decade of fatal injuries in workers in New Zealand: insights from a comprehensive national observational study. Injury Prevention. 2021; 27(2):124-130.

<https://doi.org/10.1136/injuryprev-2020-043643> [open access]

Abstract: Introduction: Current priorities and strategies to prevent work-related fatal injury (WRFI) in New Zealand (NZ) are based on incomplete data capture. This paper provides an overview of key results from a comprehensive 10-year NZ study of worker fatalities using coronial records. Methods: A data set of workers, aged 15-84 years at the time of death who died in the period 2005-2014, was created using coronial records. Data collection involved: (1) identifying possible cases from mortality records using selected external cause of injury codes; (2) linking these to coronial records; (3) retrieving and reviewing records for work-relatedness; and (4) coding work-related cases. Frequencies, percentages and rates were calculated. Analyses were stratified into workplace and work-traffic settings. Results: Over the decade, 955 workers were fatally injured, giving a rate of 4.8 (95% CI 5.6 to 6.3) per 100 000 worker-years. High rates of worker fatalities were observed for workers aged 70-84 years, indigenous Maori and for males. Workers employed in mining had the highest rate in workplace settings while transport, postal and warehousing employees had the highest rate in work-traffic settings.



Vehicle-related mechanisms dominated the mechanism and vehicles and environmental agents dominated the breakdown agencies contributing to worker fatalities. Discussion: This study shows the rates of worker fatalities vary widely by age, sex, ethnicity, occupation and industry and are a very serious problem for particular groups. Future efforts to address NZ's high rates of WRFI should use these findings to aid understanding where preventive actions should be prioritised.

Peterson C, Xu L, and Barnett SBL. Average lost work productivity due to non-fatal injuries by type in the USA. Injury Prevention. 2021; 27(2):111-117.

<https://doi.org/10.1136/injuryprev-2019-043607> [open access]

Abstract: OBJECTIVE: To estimate the average lost work productivity due to non-fatal injuries in the USA comprehensively by injury type. METHODS: The attributable average number and value of lost work days in the year following non-fatal emergency department (ED)-treated injuries were estimated by injury mechanism (eg, fall) and body region (eg, head and neck) among individuals age 18-64 with employer health insurance injured 1 October 2014 through 30 September 2015 as reported in MarketScan medical claims and Health and Productivity Management databases. Workplace, short-term disability and workers' compensation absences were assessed. Multivariable regression models compared lost work days among injury patients and matched controls during the year following injured patients' ED visit, controlling for demographic, clinical and health insurance factors. Lost work days were valued using an average US daily market production estimate. Costs are 2015 USD. RESULTS: The 1-year per-person average number and value of lost work days due to all types of non-fatal injuries combined were approximately 11 days and US\$1590. The range by injury mechanism was 1.5 days (US\$210) for bites and stings to 44.1 days (US\$6196) for motorcycle injuries. The range by body region was 4.0 days (US\$567) for other head, face and neck injuries to 19.8 days (US\$2787) for traumatic brain injuries. CONCLUSIONS AND RELEVANCE: Injuries are costly and preventable. Accurate estimates of attributable lost work productivity are important to monitor the economic burden of injuries and help to prioritise cost-effective public health prevention activities



Rashid M, Heiden M, Nilsson A, and Kristofferzon ML. Do work ability and life satisfaction matter for return to work? Predictive ability of the work ability index and life satisfaction questionnaire among women with long-term musculoskeletal pain. BMC Public Health. 2021; 21(1):584.

<https://doi.org/10.1186/s12889-021-10510-8> [open access]

Abstract: BACKGROUND: Impaired work ability and reduced life satisfaction due to long-term musculoskeletal pain, particularly in neck, shoulders and back, are considered occupational health problems that can result in workers taking sick leave. The aim of the study was to determine whether work ability and life satisfaction predict return to work (RTW) among women with long-term neck/shoulder and/or back pain, and to assess the ability of the Work Ability Index (WAI) and the Life Satisfaction Questionnaire (LiSat-11) to discriminate between those who did RTW and those who did not RTW (NRTW). METHODS: This is a cohort study with 1-year follow-up. A survey was sent to 600 women receiving sick leave benefits from the Swedish Social Insurance Agency. In total, 208 women responded at baseline, and 141 at a 1-year follow-up. To identify whether work ability and life satisfaction predicted RTW, multiple logistic regression analyses were performed with and without adjustment for type of work and pain intensity. To assess the discriminative ability of the WAI and the LiSat-11 for women who did RTW and those who did NRTW, receiver operating characteristic curves were fitted. RESULTS: Work ability predicted RTW, and the results remained significant after adjusting for type of work and pain intensity (OR 1.12, 95% CI: 1.04-1.22). Life satisfaction was not significant. The WAI at baseline adequately discriminated between RTW and NRTW after 1 year (Area under curve 0.78, 95% CI: 0.70-0.86), but the LiSat-11 did not. CONCLUSIONS: This study supports a relationship between work ability and RTW among women on sick leave for long-term neck/shoulder and/or back pain. The results indicate that the WAI, but not the LiSat-11, can discriminate between RTW and NRTW in the population under study. Although the discriminative ability of the WAI needs to be verified in new samples before it can be recommended for use in rehabilitation settings, we suggest that healthcare professionals consider how women perceive their work ability in order to better support them in their RTW



Saito Y, Tomori K, Sawada T, Takahashi S, Nakatsuka S, Sugawara H, et al. Determining whether occupational therapy goals match between pairs of occupational therapists and their clients: a cross-sectional study. Disability and Rehabilitation. 2021; 43(6):828-833.

<https://doi.org/10.1080/09638288.2019.1643417>

Abstract: PURPOSE: This study examined the degree to which goals perceived by occupational therapists (OTs) matched those perceived by their clients. METHODS: A total of 100 clients and 79 OTs were recruited from seven subacute rehabilitation wards in Japan. Matched pairs of OTs and their clients were independently asked for their perception about the clients' occupational therapy goals through semi-structured interviews. RESULTS: Collectively, the OTs reported 239 goals, while the clients reported 161 goals. While both the OTs and the clients reported a high level of client engagement in the goal setting process, 79% of the goal statements were mismatched between pairs of OTs and their clients. Goal matching was slightly better for goals about activities of daily living or participation than for goals about body structure or body function. CONCLUSIONS: Although most OTs and their clients perceived that they engaged in goal-setting together, only 21% of reported goals actually matched between OTs and clients. It would also be worth investigating whether there is any correlation between the content of goals, patient engagement in goal setting, degree of goal matching, and health outcomes achieved by clients following discharge from rehabilitation services. Implications for rehabilitation Although most occupational therapists (OTs) and their clients perceived that they engaged in goal-setting together, 79% of the goals independently reported by OTs and their clients did not match in seven post-acute rehabilitation wards across Japan. Goals were slightly more likely to match if the topic of the goals related to instrumental activities of daily living or participation (30.3%) or basic activities of daily living (24.7%) than if the topic of the goals were about body structure or body function (11.2%); however, the overall rate of goal matching was low. Japanese OTs need to develop more effective methods for recording or communicating goals in ways that clients can understand; this may be the same for other countries



Schmidt W and Muller A. Workplace universalism and the integration of migrant workers and refugees in Germany. Industrial Relations Journal. 2021; 52(2):145-160.

<https://doi.org/10.1111/irj.12320>

Stahl C and MacEachen E. Universal basic income as a policy response to COVID-19 and precarious employment: potential impacts on rehabilitation and return-to-work. Journal of Occupational Rehabilitation. 2021; 31(1):3-6.

<https://doi.org/10.1007/s10926-020-09923-w> [open access]

Vargas-Garrido H, Moyano-Diaz E, and Andrades K. Sleep problems are related to commuting accidents rather than to workplace accidents. BMC Public Health. 2021; 21(1):652.

<https://doi.org/10.1186/s12889-021-10737-5>

Abstract: Background: This study aimed to verify the relationships between sleep problems and both commuting and workplace accidents in workers of both sexes. Methods: The study was carried out with a sample of workers (n = 2993; 50.2% female) from the Chilean Quality of Life Survey (ENCAVI) 2015-2016, while the rates of both workplace and commuting accidents were extracted from the statistics of the Superintendence of Social Security (SUSESO 2015; 180,036 and 52,629 lost-time accidents, respectively). Results: Chilean workers sleep less than the rest of the people in the country (MW = 7.14 vs. MO = 7.33; $t(6789) = -5.19$; $p < .001$), while the Chilean people as a whole sleep less compared to those of other countries (7.24 h per day). Likewise, it was found that sleep problems are more strongly related to commuting than to workplace accidents. In this vein, sleep quantity can explain 24% of the variance in commuting accidents' rates (Stepwise Method; $R^2 = .30$, $F(1,14) = 5.49$, $p < .05$; $\beta = -.55$, $p < .05$), by using aggregated data with all types of commuting roles (driver of a vehicle, a passenger of public or private transport, or as a pedestrian). Conclusions: Our findings show that sleep quantity has a more robust relationship with commuting than workplace accidents, a neglected issue so far. Future prevention programs should emphasize sleep hygiene and focus on commuting to and from work.



Villotti P, Gragnano A, Lariviere C, Negrini A, Dionne CE, and Corbiere M. Tools appraisal of organizational factors associated with return-to-work in workers on sick leave due to musculoskeletal and common mental disorders: a systematic search and review. Journal of Occupational Rehabilitation. 2021; 31(1):7-25.

<https://doi.org/10.1007/s10926-020-09902-1>

Abstract: Purpose The objective of this study was to identify organizational factors that are predictive of return-to-work (RTW) among workers with musculoskeletal (MSD) and common mental disorders (CMD), and to subsequently catalogue and characterize the questionnaires (tools) used to measure them. Methods A systematic search on PubMed, Web of Science and PsycINFO library databases and grey literature was conducted. First, a list of organizational factors predictive of RTW for the two populations considered was built. Second, the questionnaires used to measure these factors were retrieved. Third, we looked in the scientific literature for studies on the psychometric properties and practical relevance of these questionnaires. Results Among the factors retained, perceived social support from supervisor and co-workers, work accommodations, and job strain were identified as common RTW factors. Other risk/protective factors, and associated tools, specifically targeting either people with MSD or CMD were also analysed. Conclusions Researchers and practitioners are often uncertain of which tools to use to measure organizational factors which can facilitate or hinder RTW. This study provides an evaluation of the tools measuring predictive organizational RTW factors in people with MSD and CMD. The identified tools can be used in everyday practice and/or research

