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

***Le VT, Fulton-Kehoe D, Sears JM, Nkyekyer EW, Ehde DM, Young M, et al. Trends and disparities in the use of telehealth among injured workers during the COVID-19 pandemic. *Journal of Occupational & Environmental Medicine*. 2022; 64(4):e249-e256.**

<https://doi.org/10.1097/JOM.0000000000002520>

Abstract: OBJECTIVE: To describe telehealth trends within a population-based workers' compensation system during the COVID-19 pandemic, and to assess telehealth utilization by sociodemographic characteristics. METHODS: This cross-sectional study used Washington State workers' compensation claims and medical billing data from January 2019 to October 2020. RESULTS: Telehealth use averaged 1.2% of medical bills pre-pandemic, peaked in April 2020 at 8.8%, and leveled off to around 3.6% from July to October 2020. Telehealth utilization differed significantly by age, sex, number of dependents, injury, industry, and receipt of interpreter services. Workers residing in counties with higher population, lower poverty rates, and greater Internet access had higher telehealth usage. CONCLUSIONS: There were dramatic shifts in telehealth; usage differed by sociodemographic characteristics. Further studies evaluating disparities in tele-health access among injured workers are needed

***Tomba E, Samosh D, and Santuzzi AM. Guest editorial. The benefits of inclusion: disability and work in the 21st century. *Equality, Diversity and Inclusion*. 2022; 41(3):309-317.**

<https://doi.org/10.1108/EDI-04-2022-376> [open access]

Bensonch C, Argyropoulos CD, Dimopoulos C, Varianou Mikellidou C, and Boustras G. Analysis of safety climate factors and safety compliance relationships in the oil and gas industry. *Safety Science*. 2022; 151:105744.

<https://doi.org/10.1016/j.ssci.2022.105744>

Bouziri H, Descatha A, Roquelaure Y, Dab W, and Jean K. Can we distinguish the roles of demographic and temporal changes in the incidence and prevalence of musculoskeletal disorders? A systematic review. *Scandinavian Journal of Work, Environment & Health*. 2022; 48(4):253-263.

<https://doi.org/10.5271/sjweh.4018> [open access]

Abstract: OBJECTIVES: Musculoskeletal disorders (MSD) represent a major public health issue, affecting more than 40 million European workers in 2017. The overall aging of the working population is expected to increase the burden of disease, but temporal changes in exposures or diagnosis may also drive the global trends in MSD. We therefore conducted a systematic review to summarize the evidence on the role of demographic and temporal changes in the occurrence of MSD. METHODS: We conducted a systematic review of articles reporting temporal trends in MSD in the general working-age population. Only articles controlling for age in the analysis were included. The risk of bias was assessed. The main indicators extracted were age-controlled time trends in MSD incidence or prevalence. RESULTS: Among 966 articles, 16 fulfilled the inclusion criteria, representing 23 results according to the indicators extracted. No study was found with a high risk of bias. Results presenting time trends in prevalence were found in 12 studies and incidence in 11. After controlling for age, the reported temporal trends varied, mostly between non-monotonic changes (N=12/23) and increases (N=10/23). One article also highlighted an increase among women and non-monotonic changes among men (N=1/23). Several factors other than aging were suggested to explain temporal trends in MSD, mainly trends in obesity, changing occupational exposures, and cultural factors regarding pain tolerance. CONCLUSION: This review shows that different kind of factors in addition to aging may contribute to varying or increasing trends in MSD. This review also highlighted the scarcity of evidence regarding time trends in the burden of MSD and their underlying causes

Charalampous P, Polinder S, Wothge J, Von der Lippe E, and Haagsma JA. A systematic literature review of disability weights measurement studies: evolution of methodological choices. *Archives of Public Health*. 2022; 80(1):91.

<https://doi.org/10.1186/s13690-022-00860-z> [open access]

Abstract: Background: The disability weight is an essential factor to estimate the healthy time that is lost due to living with a certain state of illness. A 2014 review showed a considerable variation in methods used to derive disability weights. Since then, several sets of disability weights have been developed. This systematic review aimed to provide an updated and comparative overview of the methodological design choices and surveying techniques that have been used in disability weights measurement studies and how they evolved over time.

Methods: A literature search was conducted in multiple international databases (early-1990 to mid-2021). Records were screened according to pre-defined eligibility criteria. The quality of the included disability weights measurement studies was assessed using the Checklist for Reporting Valuation Studies (CREATE) instrument. Studies were collated by characteristics and methodological design approaches. Data extraction was performed by one reviewer and discussed with a second. **Results:** Forty-six unique disability weights measurement studies met our eligibility criteria. More than half ($n = 27$; 59%) of the identified studies assessed disability weights for multiple ill-health outcomes. Thirty studies (65%) described the health states using disease-specific descriptions or a combination of a disease-specific descriptions and generic-preference instruments. The percentage of studies obtaining health preferences from a population-based panel increased from 14% (2004-2011) to 32% (2012-2021). None of the disability weight studies published in the past 10 years used the annual profile approach. Most studies performed panel-meetings to obtain disability weights data. **Conclusions:** Our review reveals that a methodological uniformity between national and GBD disability weights studies increased, especially from 2010 onwards. Over years, more studies used disease-specific health state descriptions in line with those of the GBD study, panel from general populations, and data from web-based surveys and/or household surveys. There is, however, a wide variation in valuation techniques that were used to derive disability weights at national-level and that persisted over time.

Finnes A, Hoch JS, Enebrink P, Dahl J, Ghaderi A, Nager A, et al. Economic evaluation of return-to-work interventions for mental disorder-related sickness absence: two years follow-up of a randomized clinical trial. *Scandinavian Journal of Work, Environment & Health*. 2022; 48(4):264-272.

<https://doi.org/10.5271/sjweh.4012> [open access]

Abstract: **OBJECTIVE:** The objective was to (i) assess the long-term cost-effectiveness of acceptance and commitment therapy (ACT), a workplace dialog intervention (WDI), and ACT+WDI compared to treatment as usual (TAU) for common mental disorders and (ii) investigate any differences in cost-effectiveness between diagnostic groups. **METHODS:** An economic evaluation from the healthcare and limited welfare perspectives was conducted alongside a randomized clinical trial with a two-year follow-up period. Persons with common mental disorders receiving sickness benefits were invited to the trial. We used registry data for cost analysis alongside participant data collected during the trial and the reduction in sickness absence days as treatment effect. A total of 264 participants with a diagnosis of depression, anxiety, or stress-induced exhaustion disorder participated in a two-year follow-up of a four-arm trial: ACT (N=74), WDI (N=60), ACT+WDI (N=70), and TAU (N=60). **RESULTS:** For all patients in general, there were no statistically significant differences between interventions in terms of costs or effect. The subgroup analyses suggested that from a healthcare perspective, ACT was a cost-effective option for depression or anxiety disorders and ACT+WDI for stress-induced exhaustion disorder. With a two-year time horizon, the probability of WDI to be cost-saving in terms of sickness benefits costs was 80% compared

with TAU. CONCLUSIONS: ACT had a high probability of cost-effectiveness from a healthcare perspective for employees on sick leave due to depression or anxiety disorders. For participants with stress-induced exhaustion disorder, adding WDI to ACT seems to reduce healthcare costs, while WDI as a stand-alone intervention seems to reduce welfare costs

Juczynski Z and Oginska-Bulik N. Ruminations and occupational stress as predictors of post-traumatic stress disorder and burnout among police officers. *International Journal of Occupational Safety & Ergonomics*. 2022; 28(2):743-750.

<https://doi.org/10.1080/10803548.2021.1907986>

Abstract: The profession of policeman is one of the most stressful. It is associated with exposure to traumatic experiences. This research study aimed to determine the predictors of symptoms of post-traumatic stress disorder (PTSD) and occupational burnout and to examine how they correlated in policemen. We searched for these predictors in cognitive activity, and specifically in ruminations and perceived job stress. The study was conducted with 120 police officers who have experienced traumatic events related to their job. The study showed that intrusive ruminations serve as a predictor that intensifies PTSD, while certain stressful work conditions are predictors of burnout. The results suggest that numerous mechanisms are at play in the pathogenesis of PTSD and burnout. Police officers cope much better with exposure to traumatic stressors than with stressful work conditions. This leads to a practical conclusion regarding the necessity of preventing the everyday job stress experienced by police officers

Mohammad Kazemi Rostami M, Dehghani A, and Eslami Akbar R. The effect of job stress management training on observance of professional ethics by nurses. *Archives of Environmental & Occupational Health*. 2022; 77(4):276-281.

<https://doi.org/10.1080/19338244.2021.1873722>

Abstract: The present study was conducted to investigate the effect of job stress management training on observance of professional ethics by nurses. This quasi-experimental study was performed on 50 clinical nurses in Shiraz, Iran. Data collection tools included a questionnaire. The research intervention consisted of six two-hour sessions of stress management training. SPSS 21 were used to analyze the data. Data analysis showed that before intervention, the level of professional ethics of 64% of nurses was relatively good, but after intervention, the level of professional ethics of the majority of nurses (94%) was at the desired level. The results showed that the levels of professional ethics after job stress management training has increased significantly compared to before. The results showed that stress management training has led to improving the level of professional ethics of nurses

Kellezi B, Dhiman P, Coupland C, Whitehead J, Morriss R, Joseph S, et al. Mental health and other factors associated with work productivity after injury in the UK: multicentre cohort study. *Injury Prevention*. 2022; 28(2):131-140.

<https://doi.org/10.1136/injuryprev-2021-044311>

Abstract: INTRODUCTION: Mental health conditions are a major contributor to productivity loss and are common after injury. This study quantifies postinjury productivity loss and its association with preinjury and postinjury mental health, injury, demographic, health, social and other factors. METHODS: Multicentre, longitudinal study recruiting hospitalised employed individuals aged 16-69 years with unintentional injuries, followed up at 1, 2, 4 and 12 months. Participants completed questionnaires on injury, demographic factors, health (including mental health), social factors, other factors and on-the-job productivity upon return to work (RTW). ORs were estimated for above median productivity loss using random effects logistic regression. RESULTS: 217 adults had made an RTW at 2, 4 or 12 months after injury: 29% at 2 months, 66% at 4 months and 83% at 12 months. Productivity loss reduced over time: 3.3% of working time at 2 months, 1.7% at 4 months, 1% at 12 months.

Significantly higher productivity loss was associated with preinjury psychiatric conditions (OR 21.40, 95% CI 3.50 to 130.78) and post-traumatic stress avoidance symptoms at 1 month (OR for 1-unit increase in score 1.15, 95% CI 1.07 to 1.22). Significantly lower productivity loss was associated with male gender (OR 0.32, 95% CI 0.14 to 0.74), upper and lower limb injuries (vs other body regions, OR 0.15, 95% CI 0.03 to 0.81) and sports injuries (vs home, OR 0.18, 95% CI 0.04 to 0.78). Preinjury psychiatric conditions and gender remained significant in analysis of multiply imputed data. CONCLUSIONS: Unintentional injury results in substantial productivity loss. Females, those with preinjury psychiatric conditions and those with post-traumatic stress avoidance symptoms experience greater productivity loss and may require additional support to enable successful RTW

Kelly D, Schroeder S, and Leighton K. Anxiety, depression, stress, burnout, and professional quality of life among the hospital workforce during a global health pandemic. *Journal of Rural Health*. 2022; [epub ahead of print].

<https://doi.org/10.1111/jrh.12659>

Abstract: PURPOSE: Working in a hospital setting during a global health pandemic can lead to increased levels of anxiety, stress, burnout, and depression. Anecdotal evidence exists, but there is little research utilizing clinically validated tools to measure hospital staff psychological distress. METHODS: In Summer 2021, 771 hospital staff in North Dakota responded to an electronic survey collecting demographic data and employing validated behavioral health screening tools to assess anxiety, depression, emotional distress, and work-related quality of life. FINDINGS: Compassion satisfaction was significantly higher for those who worked in rural areas than urban [$t(769) = -1.99, P = .0467$]. The burnout rating was significantly higher for those who worked in urban areas than rural [$t(769) = 2.23, P = .0261$]. There was no significant geographic variation in stress, anxiety, or depression. Anxiety, depression, burnout, and stress were all significantly higher for those who worked directly

with COVID-19 patients than those who did not, regardless of hospital location.

CONCLUSIONS: Hospital staff caring for COVID-19 patients experienced equitable (and high) levels of depression and anxiety. However, data indicate that rural providers experienced greater protective factors, resulting in lower rates of burnout and higher compassion satisfaction. Rural communities, hospitals, and health systems may have characteristics that could be duplicated in urban areas to support hospital staff well-being. Support and promotion of mental wellness must also come from the hospital system, and health care and policy leaders. If we do not care for our hospital staff, there will not be hospital staff left to care for the community

Lan T, Goh YM, Jensen O, and Asmore AS. The impact of climate change on workplace safety and health hazard in facilities management: an in-depth review. Safety Science. 2022; 151:105745.

<https://doi.org/10.1016/j.ssci.2022.105745>

Lovreglio P, Leso V, Riccardi E, Stufano A, Pacella D, Cagnazzo F, et al. Coronavirus disease (COVID-19) pandemic: the psychological well-being in a cohort of workers of a multinational company. Safety and Health at Work. 2022; 13(1):66-72.

<https://doi.org/10.1016/j.shaw.2021.10.006> [open access]

Abstract: Background: The aim of the present study was to evaluate the psychological well-being (PWB) during the coronavirus disease (COVID-19) pandemic in workers of a multinational company. Methods: Employees (aged ≥ 18 years) were recruited from Latin American, North American, New Zealand, and European sites of a multinational company operative during all the pandemic period. The self-reported Psychological General Well-Being Index was used to assess the global PWB and the effects on six subdomains: anxiety, depressed mood, positive well-being, self-control, general health, and vitality. The influencing role of age, gender, geographical location, COVID-19 epidemiology, and restrictive measures adopted to control the pandemic was explored. Results: A total of 1335 workers completed the survey. The aggregate median PWB global score was in a positive range, with significantly better outcomes detected in the Mexican and Colombian Latin American sites compared with the other worldwide countries ($p < 0.001$). Among the European locations, a significantly higher PWB score was determined in Spain compared with the German and French sites ($p < 0.05$). Comparable geographical trends were demonstrated for all the PWB subdomains. Male workers had a significantly better PWB compared with females ($p < 0.05$), whereas a negative correlation emerged with aging ($p = 0.01$). COVID-19 epidemiology and pandemic control measures had no clear effects on PWB. Conclusion: Monitoring PWB and the impact of individual and pandemic-related variables may be helpful to clarify the mental health effects of pandemic, define targeted psychological-supporting measures, also in the workplace, to face such a complex situation in a more constructive way.

Marjerrison N, Jakobsen J, Grimsrud TK, Hansen J, Martinsen JI, Nordby KC, et al. Cancer incidence in sites potentially related to occupational exposures: 58 years of follow-up of firefighters in the Norwegian Fire Departments Cohort. *Scandinavian Journal of Work, Environment & Health*. 2022; 48(3):210-219.

<https://doi.org/10.5271/sjweh.4009> [open access]

Abstract: Objectives: Firefighters are exposed to a variety of known and suspected carcinogens through their work. However, the association with cancer risk has limited evidence. We examined cancer incidence among firefighters in the newly established Norwegian Fire Departments Cohort restricted to sites with established associations with carcinogens encountered during firefighting. This included sites within the respiratory, urinary, and lympho-hematopoietic systems, and the skin and all sites combined. Methods: Male firefighters (N=3881) in the cohort were linked to the Cancer Registry of Norway for incident cancer cases occurring during the period 1960-2018. We calculated standardized incidence ratios (SIR) with rates for the national male population as reference, and stratified SIR analyses by period of first employment, duration of employment, and time since first employment. Results: Elevated risk was seen for all sites combined (SIR 1.15, 95% confidence interval 1.07-1.23). Elevated risk of urinary tract cancer was observed among firefighters who began working before 1950, and with observation ≥ 40 years since first employment. Risk of mesothelioma and laryngeal cancer were elevated with ≥ 40 years since first employment and with ≥ 30 years employment duration. Conclusions: The observed associations between firefighting and urinary tract cancer, laryngeal cancer, and mesothelioma have been observed in some studies previously, and our results suggest the observed elevated risks are related to carcinogenic occupational exposures. Differences in risk by period of employment potentially reflect changes in exposures from improved quality and use of personal protective equipment.

Mercan MA, Barlin H, and Begen N. Does an increase in working hours affect mortality risk? The relationship between working hours and mortality among the older population. *Work*. 2022; 71(3):625-639.

<https://doi.org/10.3233/WOR-205175>

Abstract: BACKGROUND: Population aging, caused by an increase in life expectancy and decrease in fertility rates, has created changes and challenges in various spheres, including the labor market. Though health deteriorates with age, more and more older adults choose to stay in the labor force and work into late life. OBJECTIVE: Understanding the effects of various work conditions on the health of older workers is crucial for designing policies and interventions to ensure healthy late life and maintain a productive workforce. To contribute to this endeavor, this study investigates the relationship between long working hours (LWH) and mortality among older populations. METHODS: The study uses the Cox proportional hazards regression model to investigate data from the Health and Retirement Survey (HRS) between the years 1992-2016, a longitudinal nationally representative dataset from the United States. RESULTS: The results indicate that working 50 hours or more per week is not

associated with an increased risk of mortality, for the full sample (1.45 [95% CI: 0.86, 2.45]), for both genders (females 0.51 [95% CI: 0.06, 4.28], males 1.45 [95% CI: 0.81, 2.61]), and for immigrants (female immigrants 0.55 [95% CI: 0.06, 4.75], male immigrants 1.44 [95% CI: 0.79, 2.62]). CONCLUSIONS: This analysis confirms and extends the findings of earlier studies by taking into consideration the potential impact of many demographic, socioeconomic, work-related and health-related factors

Schmajuk G, Trupin L, Yelin EH, and Blanc PD. Dusty trades and associated rheumatoid arthritis in a population-based study in the coal mining counties of Appalachia.

Occupational & Environmental Medicine. 2022; 79(5):308-314.

<https://doi.org/10.1136/oemed-2021-107899>

Abstract: Objectives: We previously showed increased coal mining-associated risk of rheumatoid arthritis (RA). Using additional survey data, we sought to delineate this risk further. Methods: We used data from two cross-sectional, random-digit-dial, population-based surveys (males \geq 50 years) in selected counties in the Appalachian region of the inland, mid-Atlantic USA with elevated pneumoconiosis mortality. Surveys ascertained age, smoking, coal mining and non-coal silica exposure jobs. In a subset, we surveyed ergonomic exposures, scored by intensity. We queried diagnosis of RA, corticosteroid use, and, in a subset, use of disease modifying antirheumatic drugs (DMARDs). Multivariable logistic regression modelled RA risk (defined by glucocorticoid or DMARDs use) associated with coal mining employment, other silica exposure, smoking status, and age and ergonomic exposures. Results: We analysed data for 2981 survey respondents (mean age 66.6 years; 15% current, 44% ex-smokers). The prevalence of glucocorticoid-treated and DMARD-treated RA was 11% and 4%, respectively. Glucocorticoid-treated RA was associated with coal mining (OR 3.5; 95% CI 2.5 to 4.9) and non-coal mining silica exposure (OR 3.2; 95% CI 2.4 to 4.4). For DMARD-treated RA, the odds associated with coal mining and other silica remained elevated: OR 2.3 (95% CI 1.18, 4.5) and OR 2.7 (95% CI 1.51, 5.0), respectively. In the same model, the highest intensity ergonomic exposure also was associated with increased odds of RA (OR 4.3; 95% CI 1.96 to 9.6). Conclusions: We observed a strong association between coal mining and other silica-exposing dusty trades and RA. Clinicians and insurers should consider occupational histories in the aetiology of RA.

Yang Y, Chen B, Huang P, Wang Y, Zhang L, and Cai F. Prevalence and influencing factors of depressive symptoms among rural-to-urban migrant workers in China: a systematic review and meta-analysis. Journal of Affective Disorders. 2022; 307:11-19.

<https://doi.org/10.1016/j.jad.2022.03.061>

Abstract: BACKGROUND: Rural-to-urban migrant workers are a large group in China, and they are often more prone to mental health problems, especially depression. We expected to use meta-analysis to estimate the prevalence of depressive symptoms and the influencing factors of depressive symptoms among rural-to-urban migrant workers in China. METHODS: PubMed, Web of Science, Embase, Scopus, CINAHL Complete, PsycARTICLES, CNKI, Wan Fang,

CBM, and Cochrane were searched on October 16, 2021. The data were analyzed using OR and random effect model in Revman5.3 and STATA 15 Software. RESULTS: We included 30 studies involving 43,884 rural-to-urban migrant workers. The prevalence of depressive symptoms among rural-to-urban migrant workers in China was 0.28 (95% CI:0.22, 0.34); Results of the meta-analysis showed that working hours, sleep status, self-rated health, financial condition, job satisfaction, marriage, and social support were correlated with depressive symptoms. LIMITATIONS: The systematic review and meta-analysis included only cross-sectional studies, and more types of original studies on depressive symptoms of rural-to-urban migrant workers in China should be carried out in the future. CONCLUSION: The prevalence of depressive symptoms among rural-to-urban migrant workers in China is 28%. Government departments can intervene early in the process to promote the mental health of this group based on influencing factors of depressive symptoms among rural-to-urban migrant workers in China

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