IWH Research Alert
August 28, 2020

Anton D, Bray M, Hess JA, Weeks DL, Kincl LD, and Vaughan A. Prevalence of work-related musculoskeletal pain in masonry apprentices. Ergonomics. 2020; 63(9):1194-1202. https://doi.org/10.1080/00140139.2020.1772380

Abstract: The construction industry, specifically masonry, reports more work-related musculoskeletal disorders (WMSD) rates than the general industry. Masonry apprentices are assumed to be healthy, yet may have WMSDs. The purpose of this study was to evaluate the prevalence of musculoskeletal symptoms (MSS), time loss, and healthcare use among apprentices. 183 brick and block masonry apprentices completed surveys on demographics, work history, MSS, and functional well-being. The prevalence of MSS was calculated by body region, time loss, and healthcare use. The relationship between MSS, and perceived global physical and mental health was assessed. Approximately 78% of apprentices reported MSS, most in several body regions. Low back and wrists/hands were most prevalent, although few missed work or sought healthcare. Lower functional health and well-being was reported. Apprentices reported MSS comparable to previous studies of journey-level masons. Apprenticeship programmes could integrate ergonomics education to

help apprentices develop safety culture early in their careers. Practitioner Summary: New masonry workers (apprentices) are assumed to be healthy yet work-related musculoskeletal symptoms (MSS) may be common early in their career. The prevalence of MSS was assessed among apprentices. Approximately 78% of apprentices reported MSS, most in several body regions, comparable to journey-level masons. Abbreviations: WMSD: work-related musculoskeletal disorders; MSS: musculoskeletal symptoms; SAVE: SAfety voice for ergonomics; MNQ: modified nordic questionnaire; FTE: full-time equivalent; SF-12: short from-12v2

Blanc F and Pereira MME. Risks, circumstances and regulation: historical development, diversity of structures and practices in occupational safety and health inspections. Safety Science. 2020; 130:104850.
https://doi.org/10.1016/j.ssci.2020.104850

Byon HD, Liu X, Crandall M, and Lipscomb J. Understanding reporting of type II workplace violence among home health care nurses. Workplace Health & Safety. 2020; 68(9):415-421.
https://doi.org/10.1177/2165079920910758
Abstract: Background: Home health care nurses (HHNs) work alone in patients' homes. They experience high rates of Type II (client/patient-on-worker) workplace violence (WPV); however, little is known about the extent and factors of their reporting. Methods: A convenience sample of employees aged 18 years and older and working as an HHN or management staff were recruited from a U.S. nonprofit home health care agency. To describe the extent of reporting of WPV events, an HHN survey was conducted. To identify the barriers and facilitators to reporting, two HHN focus groups were conducted, and management key informant interviews were employed. Findings: We recruited 18 HHNs and five management staff into the study. Almost all HHNs reported to management the most serious forms of violence they experienced, and that HHNs reported WPV when they perceived that reporting was beneficial (alerting other nurses and management) and supported by management staff. However, they were unwilling to report when it was perceived as disadvantageous (reliving the trauma), discouraged (by a norm that experiencing violence is a part of the job),

unachievable (unstandardized reporting process), and ambiguous (uncertain of what is reportable). Management staff perceived a lack of standardized reporting processes as a barrier when responding to HHNs' reporting. Conclusion/Application to Practice: High reporting was related to strong support from management. Policies and procedures should clearly define WPV, the threshold for reporting, how to report, and how management will respond to the reports

Chen J, Meyerhoefer CD, and Peng L. The effects of paid sick leave on worker absenteeism and health care utilization. Health Economics. 2020; 29(9):1062-1070.
https://doi.org/10.1002/hec.4118
Abstract: We estimate the short-term effects of paid sick leave on worker absenteeism and health care utilization in the United States using data from the 2000-2013 Medical Expenditure Panel Survey. We use both parametric and matching-based difference-in-differences methods to account for nonrandom selection into jobs that offer paid sick leave and estimate the treatment effect separately for workers who gained and lost sick leave benefits. We find consistent evidence of increased absenteeism among female workers who gained paid sick leave but not for other groups. Estimates for office-based visits are mostly statistically insignificant and may not have a causal interpretation due to preexisting trends

Denis D, Gonella M, Comeau M, and Lauzier M. Questioning the value of manual material handling training: a scoping and critical literature review. Applied Ergonomics. 2020; 89:103186.
https://doi.org/10.1016/j.apergo.2020.103186
Abstract: Manual material handling training (MMHT) is of questionable value according to five meta-analyses. However, little is known about why this is so. The aim of this study is to take a closer look at how MMHT are evaluated in order to identify what could explain judgement about their (lack of) effectiveness. Seventy-seven studies were included in a scoping review, and were analyzed using an inductive grid comprising numerous criteria. Workplace training programs, being the most frequent, were described in these papers in greater detail. Given the broad range of contexts it was found that MMHT differed greatly from one study to the other. All the while, contents presented through these programs were surprisingly

uniform, with an emphasis on adopting the safe handling technique commonly known as "straight back, bent knees", although such training approach principally focuses on the trainee's behaviours, while paying little (to no) attention to the work conditions that might condition correct behavioral display. Limitations of current MMHT are discussed and explanations are given in order to better explain why they are reported to be so ineffective. Concrete recommendations on how to improve them close the paper

Eldar R and Fisher-Gewirtzman D. E-worker postural comfort in the 'third-workplace': an ergonomic design assessment. Work. 2020; 66:519-538.
https://doi.org/10.3233/WOR-203195
Abstract: BACKGROUND: Biomechanical simulation is an important tool in human-centred design, allowing for the assessment of comfort interactions between user, product and space, to optimize design features from an ergonomics perspective. OBJECTIVE: The aim of this study was to develop a biomechanical model for the evaluation of postural comfort levels. METHODS: The study used the scenario-based method to focus on the electronic-worker (e-worker) sedentary tablet tasks at public workplace ('third-workplace') configurations. An empirical method determined work-related musculoskeletal disorders (WMSDs) risk levels. The experimental method was based on a motion-capture marker-based laboratory protocol and biomechanical model. Body postures were analysed to determine the WMSDs risk to the joints, and were compared to subjective questionnaires. RESULTS: Posture was affected by the tablet target location and workplace setting. The findings confirmed our hypothesis, that neutral-position cost functions govern human motion. Almost half of the time, the e-workers' joints tended to remain in the neutral position range; of the three third-workplace, high-risk variability was less significant between the 'restaurant' and 'lounge' settings, compared to the 'anywhere' configuration. CONCLUSIONS: This evaluation model can contribute to optimizing comfort level in design for third-workplace settings and other sedentary work activities; it can be used to develop guidelines for minimizing work-related strain and health hazards

Gedin F, Alexanderson K, Zethraeus N, and Karampampa K. Productivity losses among people with back pain and among population-based references: a register-based study in Sweden. BMJ Open. 2020; 10(8):e036638.
https://doi.org/10.1136/bmjopen-2019-036638 [open access]
Abstract: Objective: Back pain is the leading cause for years lived with disability globally and among the main reasons for sickness absence (SA) and disability pension (DP). The objective of this study was to explore the occurrence of SA and DP and to estimate productivity losses among individuals with back pain compared with among matched population-based references. Design: Explorative prospective cohort study using register microdata. Participants and setting: A total of 23 176 people, aged 19-60 years, with a first visit to inpatient or specialised outpatient healthcare for back pain (International Statistical Classification of Diseases and Related Health Problems code M54) in 2010 in Sweden and a matched population-based reference group (n=115 880). Outcomes: Long-term SA (in SA spells >14 days) and DP and productivity losses, measured in € (2018 prices) by multiplying the SA and DP net days by the societal cost of each such day. Results: In the back-pain group, 42% had SA or DP days; in the reference group, the corresponding proportion was 15%. Productivity loss per patient with back pain was €8928 during the 12-month follow-up period; in the reference group, it was €3499 (p<0.0001). Conclusions: SA and DP, leading to excess productivity losses among people with back pain, reflect the challenges these patients are facing to maintain their work capacity. Interventions to promote that individuals with back pain remain in paid work should be a priority in order to address the high costs.

Gross DP, Steenstra IA, Shaw W, Yousefi P, Bellinger C, and Zaiane O. Validity of the work assessment triage tool for selecting rehabilitation interventions for workers' compensation claimants with musculoskeletal conditions. Journal of Occupational Rehabilitation. 2020; 30(3):318-330.
https://doi.org/10.1007/s10926-019-09843-4
Abstract: Purpose The Work Assessment Triage Tool (WATT) is a clinical decision support tool developed using machine learning to help select interventions for patients with musculoskeletal disorders.

The WATT categorizes patients based on individual characteristics according to likelihood of successful return to work following rehabilitation. A previous validation showed acceptable classification accuracy, but we re-examined accuracy using a new dataset drawn from the same system 2 years later. Methods A population-based cohort design was used, with data extracted from a Canadian compensation database on workers considered for rehabilitation between January 2013 and December 2016. Data were obtained on demographic, clinical, and occupational characteristics, type of rehabilitation undertaken, and return to work outcomes. Analysis included classification accuracy statistics of WATT recommendations. Results The sample included 28,919 workers (mean age 43.9 years, median duration 56 days), of whom 23,124 experienced a positive outcome within 30 days following return to work assessment. Sensitivity of the WATT for selecting successful programs was 0.13 while specificity was 0.87. Overall accuracy was 0.60 while human recommendations were higher at 0.72. Conclusions Overall accuracy of the WATT for selecting successful rehabilitation programs declined in a more recent cohort and proved less accurate than human clinical recommendations. Algorithm revision and further validation is needed.

van Hoffen MFA, Norder G, Twisk JWR, and Roelen CAM. Development of prediction models for sickness absence due to mental disorders in the general working population. Journal of Occupational Rehabilitation. 2020; 30(3):308-317. https://doi.org/10.1007/s10926-019-09852-3 [open access]

Abstract: Purpose This study investigated if and how occupational health survey variables can be used to identify workers at risk of long-term sickness absence (LTSA) due to mental disorders. Methods Cohort study including 53,833 non-sicklisted participants in occupational health surveys between 2010 and 2013. Twenty-seven survey variables were included in a backward stepwise logistic regression analysis with mental LTSA at 1-year follow-up as outcome variable. The same variables were also used for decision tree analysis. Discrimination between participants with and without mental LTSA during follow-up was investigated by using the area under the receiver operating characteristic curve (AUC); the AUC was internally

validated in 100 bootstrap samples. Results 30,857 (57%) participants had complete data for analysis; 450 (1.5%) participants had mental LTSA during follow-up. Discrimination by an 11-predictor logistic regression model (gender, marital status, economic sector, years employed at the company, role clarity, cognitive demands, learning opportunities, co-worker support, social support from family/friends, work satisfaction, and distress) was AUC = 0.713 (95% CI 0.692-0.732). A 3-node decision tree (distress, gender, work satisfaction, and work pace) also discriminated between participants with and without mental LTSA at follow-up (AUC = 0.709; 95% CI 0.615-0.804). Conclusions An 11-predictor regression model and a 3-node decision tree equally well identified workers at risk of mental LTSA. The decision tree provides better insight into the mental LTSA risk groups and is easier to use in occupational health care practice.

Ipsen C and Stern S. The effect of ruralness on vocational rehabilitation applications. Journal of Vocational Rehabilitation. 2020; 53(1):89-104.
https://doi.org/10.3233/JVR-201088

Jung HS and Baek E. A structural equation model analysis of the effects of emotional labor and job stress on depression among nurses with long working hours: focusing on the mediating effects of resilience and social support. Work. 2020; 66:561-568.
https://doi.org/10.3233/WOR-203198
Abstract: BACKGROUND: Recently, hospital services have undergone massive changes. As global competition intensifies and informed patients require improved medical services, nurses' depression has increased. OBJECTIVE: We investigated the effect of emotional labor and job stress on depression in nurses with long working hours via structural equation modeling. METHODS: The data were collected in three general hospitals with 300 beds or more from August 31 to September 12, 2016, and 400 nurse practitioners agreed to participate. We retrieved 350 self-reported questionnaires in total, of which 291 were analyzed (excluding 33 containing unidentifiable values and 26 outliers). RESULTS: The emotional labor of nurses with long working hours influenced depression, whereas job stress did not. Resilience had a negative mediating effect on the relationship between emotional labor and depressive symptoms.

Social support had negative mediating effects on the relationship between job stress and depression. CONCLUSIONS: To promote the mental health of nurses in Korea, policies must decrease nurses' working hours and maintain work environments that enable them to demonstrate their full competency. Thus, it is necessary to limit long hours and implement structures and systems that promote compliance with these limitations

Karaye IM and Horney JA. The impact of social vulnerability on COVID-19 in the U.S.: an analysis of spatially varying relationships. American Journal of Preventive Medicine. 2020; 59(3):317-325.
https://doi.org/10.1016/j.amepre.2020.06.006 [open access]
Abstract: Introduction: Because of their inability to access adequate medical care, transportation, and nutrition, socially vulnerable populations are at an increased risk of health challenges during disasters. This study estimates the association between case counts of COVID-19 infection and social vulnerability in the U.S., identifying counties at increased vulnerability to the pandemic. Methods: Using Social Vulnerability Index and COVID-19 case count data, an ordinary least squares regression model was fitted to assess the global relationship between COVID-19 case counts and social vulnerability. Local relationships were assessed using a geographically weighted regression model, which is effective in exploring spatial nonstationarity. Results: As of May 12, 2020, a total of 1,320,909 people had been diagnosed with COVID-19 in the U.S. Of the counties included in this study (91.5%, 2,844 of 3,108), the highest case count was recorded in Trousdale, Tennessee (16,525.22 per 100,000) and the lowest in Tehama, California (1.54 per 100,000). At the global level, overall Social Vulnerability Index (eß=1.65, p=0.03) and minority status and language (eß=6.69, p<0.001) were associated with increased COVID-19 case counts. However, on the basis of the local geographically weighted model, the association between social vulnerability and COVID-19 varied among counties. Overall, minority status and language, household composition and transportation, and housing and disability predicted COVID-19 infection. Conclusions: Large-scale disasters differentially affect the health of marginalized communities. In this study, minority status and language, household composition and transportation, and

housing and disability predicted COVID-19 case counts in the U.S. Addressing the social factors that create poor health is essential to reducing inequities in the health impacts of disasters.

Krause JS, Iwanaga K, Reed KS, and Chan F. Importance of Intangible and tangible job considerations among participants with spinal cord injury: factor analysis and scale development. Journal of Vocational Rehabilitation. 2020; 53(1):67-75. https://doi.org/10.3233/JVR-201086

Leineweber C, Eib C, Bernhard-Oettel C, and Nyberg A. Trajectories of effort-reward imbalance in Swedish workers: differences in demographic and work-related factors and associations with health. Work and Stress. 2020; 34(3):238-258. https://doi.org/10.1080/02678373.2019.1666434

Leung N, Tsourmas NF, Yuspeh L, Kalia N, Lavin RA, Tao XG, et al. Increased spinal cord stimulator use and continued opioid treatment among injured workers: a regional pilot study. Journal of Occupational & Environmental Medicine. 2020; 62(8):e436-e441.
https://doi.org/10.1097/JOM.0000000000001933
Abstract: Objective: To determine the rate, characteristics, and costs of Spinal Cord Stimulator (SCS) placements among claimants at a Texas-based workers' compensation carrier. Methods: Indemnity claims occurring between January 1, 2008 and December 31, 2018 were assessed longitudinally. Results: While there was annual variability in rates of SCS placement, the rate of SCS placement increased from 0.21 to 1.56 per 1000 serviced claims. The average total paid claim cost of a trial and permanent placement was $141,288 and $197,813, respectively. Chronic opioid use (more than 3 months) following trial (73.0%) and permanent placement (63.8%) occurred frequently. Time between injury and trial placement decreased (2008 to 2010 = 3.1 years vs 2015 to 2018 = 2.5 years, P < 0.0001) over the study period. Conclusions: The rate of SCS placements significantly increased and duration between injury to placement decreased over time. Claimants undergoing SCS placement frequently continued to use opioids, indicating limited success in pain modulation.

Nowacki K, Grabowska S, and Lakomy K. Activities of employers and OHS services during the developing COVID-19 epidemic in Poland. Safety Science. 2020; 131:104935.
https://doi.org/10.1016/j.ssci.2020.104935

Penaloza GA, Saurin TA, Formoso CT, and Herrera IA. A resilience engineering perspective of safety performance measurement systems: a systematic literature review. Safety Science. 2020; 130:104864.
https://doi.org/10.1016/j.ssci.2020.104864

Shi Y, Xie J, Zhou ZE, Tang H, Ma H, Zhang H, et al. Family-supportive supervisor behaviors and employees' life satisfaction: the roles of work-self facilitation and generational differences. International Journal of Stress Management. 2020; 27(3):262-272.
https://doi.org/10.1037/str0000152