

IWH Research Alert
April 9, 2020

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***Furlan AD, Harvey AM, and Chadha R. Warning from Canada: Latin America, South Africa and India may face an opioid epidemic in the coming years. *Journal of Global Health*. 2020; 10(1):010324.**

<https://doi.org/10.7189/jogh.10.010324>

Blomberg S and Rosander M. Exposure to bullying behaviours and support from co-workers and supervisors: a three-way interaction and the effect on health and well-being. *International Archives of Occupational and Environmental Health*. 2020; 93(4):479-490.

<https://doi.org/10.1007/s00420-019-01503-7> [open access]

Abstract: PURPOSE: Workplace bullying can be very stressful and it has detrimental effects on health and well-being which makes it an important area of study. Social support has traditionally been seen as important in moderating work-related stress. It was hypothesised that the negative association between exposure to bullying behaviours, and health and well-being is moderated by (a) perceived support from close co-workers and (b) perceived supportive leadership. In the study, we also investigated a three-way interaction between exposure

to bullying behaviours, perceived support from close co-workers and perceived supportive leadership. This association has not been studied before and add new knowledge to the research field.

METHODS: We used a moderated moderation analysis of workplace bullying, co-worker support and supervisor support using cross-sectional data from a work environment survey with 1383 respondents (75% response rate).

RESULTS: The moderated moderation analysis confirmed the moderating effect of perceived co-worker support but not the moderating effect of perceived supervisor support. There was a three-way interaction, but not in the case of the lowest 12.6% of perceived supervisor support scores.

CONCLUSIONS: These results indicate that the negative effect of workplace bullying on health and well-being is weaker if victims perceive that they have co-worker support, but this protective effect seems to be conditional on the perceived level of supervisor support. In other words, lack of supportive leadership may block the beneficial effect of perceived co-worker support

Cheng ASK, Ng PHF, Sin ZPT, Lai SHS, and Law SW. Smart Work Injury Management (SWIM) system: artificial intelligence in work disability management. Journal of Occupational Rehabilitation. 2020; [Epub ahead of print].

<https://doi.org/10.1007/s10926-020-09886-y>

Abstract: **PURPOSE:** This paper aims to illustrate an example of how to set up a work injury database: the Smart Work Injury Management (SWIM) system. It is a secure and centralized cloud platform containing a set of management tools for data storage, data analytics, and machine learning. It employs artificial intelligence to perform in-depth analysis via text-mining techniques in order to extract both dynamic and static data from work injury case files. When it is fully developed, this system can provide a more accurate prediction model for cost of work injuries. It can also predict return-to-work (RTW) trajectory and provide advice on medical care and RTW interventions to all RTW stakeholders. The project will comprise three stages. Stage one: to identify human factors in terms of both facilitators and barriers RTW through face-to-face interviews and focus group discussions with different RTW stakeholders in order to collect opinions related to facilitators, barriers, and essential interventions for RTW of injured workers; Stage two: to develop a machine learning

model which employs artificial intelligence to perform in-depth analysis. The technologies used will include: 1. Text-mining techniques including English and Chinese work segmentation as well as N-Gram to extract both dynamic and static data from free-style text as well as sociodemographic information from work injury case files; 2. Principle component/independent component analysis to identify features of significant relationships with RTW outcomes or combine raw features into new features; 3. A machine learning model that combines Variational Autoencoder, Long and Short Term Memory, and Neural Turning Machines. Stage two will also include the development of an interactive dashboard and website to query the trained machine learning model. Stage three: to field test the SWIM system. CONCLUSION: SWIM is a secure and centralized cloud platform containing a set of management tools for data storage, data analytics, and machine learning. When it is fully developed, SWIM can provide a more accurate prediction model for the cost of work injuries and advice on medical care and RTW interventions to all RTW stakeholders. ETHICS: The project has been approved by the Ethics Committee for Human Subjects at the Hong Kong Polytechnic University and is funded by the Innovation and Technology Commission (Grant # ITS/249/18FX)

Correia MM, Chammas MC, Zavariz JD, Arata A, Martins LC, Marui S, et al. Evaluation of the effects of chronic occupational exposure to metallic mercury on the thyroid parenchyma and hormonal function. International Archives of Occupational and Environmental Health. 2020; 93(4):491-502.

<https://doi.org/10.1007/s00420-019-01499-0>

Abstract: INTRODUCTION: Experiments in animals exposed to mercury (Hg) in different chemical states have shown thyroid parenchymal and hormone alterations. However, these experiments did not allow the establishment of dose-response curves or provide an understanding of whether these Hg effects on the thyroid parenchyma occur in humans. OBJECTIVE: To evaluate the association between chronic occupational exposure to metallic Hg and alterations in thyroid hormones and gland parenchyma 14 years after the last exposure. METHODS: A cross-sectional study including 55 males exposed in the past to metallic Hg and 55 non-exposed males, paired by age, was conducted in the Hospital das Clinicas

(Brazil) from 2016 to 2017. Serum concentrations of total and free triiodothyronine (TT3 and FT3), free thyroxine (FT4), thyrotropin (TSH), reverse T3 (RT3), selenium and antithyroid antibody titers were obtained. The Hg and iodine concentrations were measured in urine. The thyroid parenchyma was evaluated by B-mode ultrasonography with Doppler. The nodules with aspects suspicious for malignancy were submitted to aspiration puncture with a thin needle, and the cytology assessment was classified by the Bethesda system. The t test or Mann-Whitney test, Chi-square test and Spearman correlation were used to compare the exposed and non-exposed groups and examine the relationships between the variables. Univariate and multivariate logistic regression models were used to trace determinants of the risk of thyroid hormone alteration. Statistical significance was defined by $p < 0.05$. RESULTS: The urinary Hg average was significantly higher in the exposed group than in the non-exposed group ($p < 0.01$). The mean TSH serum concentration in the exposed group was higher, with a statistically significant difference between the groups ($p = 0.03$). Serum concentrations of TSH exceeded the normality limit (4.20 microIU/ml) in 13 exposed individuals (27.3%) and 4 non-exposed individuals (7.3%), with a statistically significant association between the hormonal increase and exposure to Hg ($p = 0.02$). In the logistic regression model, exposure to Hg (yes or no) showed an odds ratio = 4.86 associated with an increase of TSH above the normal limit ($p = 0.04$). The serum concentrations of RT3 showed a statistically borderline difference between the groups ($p = 0.06$). There was no statistically significant difference between the mean TT3, FT3 and FT4 serum concentrations in the Hg-exposed group compared to the non-exposed group. The proportions of the echogenicity alterations were higher in the exposed group compared to the non-exposed group (27.3% versus 9.1%; $p = 0.03$). Papillary carcinomas were documented in three exposed individuals and one non-exposed individual. A follicular carcinoma was recorded in one non-exposed individual. CONCLUSIONS: Due to the higher serum TSH concentration and the prevalence of parenchymal alterations in the Hg-exposed group, even after cessation of exposure, it is recommended that the thyroid status of exposed workers be followed for a long period

Dement JM, Ringen K, Hines S, Cranford K, and Quinn P. Lung cancer mortality among construction workers: implications for early detection. Occupational and Environmental Medicine. 2020; 77(4):207-213.

<https://doi.org/10.1136/oemed-2019-106196> [open access]

Abstract: OBJECTIVES: This study examined predictors of lung cancer mortality, beyond age and smoking, among construction workers employed at US Department of Energy (DOE) sites to better define eligibility for low-dose CT (LDCT) lung cancer screening. METHODS: Predictive models were based on 17 069 workers and 352 lung cancer deaths. Risk factors included age, gender, race/ethnicity, cigarette smoking, years of trade or DOE work, body mass index (BMI), chest X-ray results, spirometry results, respiratory symptoms, beryllium sensitisation and personal history of cancer. Competing risk Cox models were used to obtain HRs and to predict 5-year risks. RESULTS: Factors beyond age and smoking included in the final predictive model were chest X-ray changes, abnormal lung function, chronic obstructive pulmonary disease (COPD), respiratory symptoms, BMI, personal history of cancer and having worked 5 or more years at a DOE site or in construction. Risk-based LDCT eligibility demonstrated improved sensitivity, specificity and positive predictive value compared with current US Preventive Services Task Force guidelines. The risk of lung cancer death from 5 years of work in the construction industry or at a DOE site was comparable with the risk from a personal cancer history, a family history of cancer or a diagnosis of COPD. LDCT eligibility criteria used for DOE construction workers, which includes factors beyond age and smoking, identified 86% of participants who eventually would die from lung cancer compared with 51% based on age and smoking alone. CONCLUSIONS: Results support inclusion of risk from occupational exposures and non-malignant respiratory clinical findings in LDCT clinical guidelines

Dong S, Geyer P, Hinton T, and Chin A. Accommodation request strategies among employees with disabilities: impacts and associated factors. Rehabilitation Counseling Bulletin. 2019; 63(3):168-178.

<https://doi.org/10.1177/0034355219834630>

Friedman C. The relationship between disability prejudice and disability employment rates. *Work*. 2020; 65(3):591-598.

<https://doi.org/10.3233/WOR-203113>

Abstract: BACKGROUND: Despite the ability to and interest in work, people with disabilities are employed at significantly lower rates than nondisabled people. Employment disparities highlight persistent social and cultural stereotypes that equate disability with unemployability. OBJECTIVE: The aim of this study was to explore the relationship between employment of people with disabilities and disability prejudice in the United States. This study had the following research question: how does disability prejudice impact state disability employment rates? METHODS: To explore these questions, we used secondary data about state disability employment (2016), as well as disability prejudice data from 270,000 nondisabled people residing in all 50 states and the District of Columbia. RESULTS: Findings from this study revealed states with higher disability prejudice scores have lower disability employment rates, suggesting employment disparities are intertwined with disability prejudice. CONCLUSIONS: Cultures and systems must be rid of harmful disability stereotypes to ensure people with disabilities can truly partake in their human and civil rights

Hoydonckx Y, Kumar P, Flamer D, Costanzi M, Raja SN, Peng P, et al. Quality of chronic pain interventional treatment guidelines from pain societies: assessment with the AGREE II instrument. *European Journal of Pain*. 2020; 24(4):704-721.

<https://doi.org/10.1002/ejp.1524>

Abstract: BACKGROUND AND OBJECTIVE: Procedures to relieve pain are performed frequently but there are concerns about patient selection, appropriate image guidance, frequency and training for physicians. Patients, healthcare providers, policymakers and licensing bodies seek evidence-based recommendations to use these interventions judiciously. In this review we appraised the methodological quality of recent clinical practice guidelines (CPGs) for interventional pain procedures. DATABASE AND DATA TREATMENT: A systematic search of the medical literature was performed. Three trained appraisers independently evaluated the methodological quality of the CPGs using a validated instrument, the Appraisal of Guidelines in Research and Evaluation II (AGREE II). Six

domains were considered: 1) score and purpose; 2) stakeholder involvement; 3) rigour of development; 4) clarity of presentation; 5) applicability and 6) editorial independence. A total of 23 items were scored. CPGs were deemed 'high quality' if a mean scaled score above 60% for rigour of development and for two other domains was obtained. RESULTS: Mean scaled domain quality scores ranged from 61.72% to 69.99%. Despite being based on modest levels of evidence, two of the four included CPGs were considered to be of high methodological quality. The AGREE II scores across the four guidelines exhibited good inter-rater reliability. None of the guidelines involved key stakeholders such as patients, other healthcare providers, and payers. CONCLUSIONS: All four CPGs were limited by a weak execution of the guideline development process. There is a need to develop methodologically sound evidence-based guidelines for the use of interventional pain procedures using a rigorous process that involves all relevant stakeholders. SIGNIFICANCE: This systematic review appraises the methodological quality of existing CPGs on interventional procedures using a validated epidemiological tool (AGREE II). The aims of this review were to identify methodological and knowledge gaps in existing CPGs. Findings of this study will help in development of a high-quality CPG that can assist healthcare providers and patients in making informed decisions while ensuring that the right intervention is performed for the right patient at the right time. The quality of the evidence provided by the CPGs provided in support of their recommendations was also evaluated

Jensen JH, Flachs EM, Skakon J, Rod NH, Bonde JP, and Kawachi I. Work-unit organizational changes and risk of cardiovascular disease: a prospective study of public healthcare employees in Denmark. *International Archives of Occupational and Environmental Health*. 2020; 93(4):409-419.

<https://doi.org/10.1007/s00420-019-01493-6>

Abstract: PURPOSE: The impact of organizational change at work on cardiovascular disease (CVD) among employees is poorly understood. We examined the longitudinal associations between different types of work-unit organizational changes and risk of CVD among employees. METHODS: We used multilevel mixed-effects parametric survival models to assess the risk of incident ischemic

heart disease and stroke (72 events) during 2014 according to organizational changes in 2013 among 14,788 employees working in the same work unit from January through December 2013. We excluded employees with pre-existing CVD events between 2009 and 2013. Data on organizational changes defined as mergers, split-ups, relocations, change in management, employee layoffs, and budget cuts were obtained from work-unit managers (59% response). RESULTS: There was an excess risk of CVD in the year following change in management (HR 2.04, 95% CI 1.10-3.78) and employee layoff (HR 2.44, 95% CI 1.29-4.59) in the work unit relative to no change. Exposure to any organizational change also suggested increased risk of CVD (HR 1.48, 95% CI 0.91-2.43). Including perceived stress as mediator in the regression models attenuated the point risk estimates only slightly, indicating no important mediation through this psychosocial factor. CONCLUSIONS: Work-unit organizational change may be associated with excess risk of incident CVD among the employees relative to stable workplaces

Korshoj M, Hannerz H, Marott JL, Schnohr P, Prescott E, Clays E, et al. Does occupational lifting affect the risk of hypertension? Cross-sectional and prospective associations in the Copenhagen city heart study. Scandinavian Journal of Work, Environment & Health. 2020; 46(2):188-197.

<https://doi.org/10.5271/sjweh.3850> [open access]

Abstract: Objective The aim of this study was to investigate cross-sectional and prospective associations between heavy occupational lifting and hypertension. Methods Data from the third, fourth and fifth examinations of the Copenhagen City Heart Study were included. Multivariable logistic regression models were applied to adjust for sex, age, body mass index (BMI), smoking, education, self-rated cardiorespiratory fitness, vital exhaustion and baseline blood pressure, and were used to estimate (i) the cross-sectional association between heavy occupational lifting and hypertension, defined as using anti-hypertensives or having a systolic blood pressure (SBP) ≥ 140 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg, and (ii) the prospective association between heavy occupational lifting and risk of becoming a systolic blood pressure case, defined as an above median change (from baseline to follow-up) and/or a shift from no use of anti-hypertensives at baseline to use

of anti-hypertensives at a ten-year follow-up. Results Both cross-sectional [odds ratio (OR) 1.06, 95% confidence interval (CI) 0.94-1.20] and prospective (OR 1.10, 95% CI 0.92-1.31) analysis indicated no relations. Explorative prospective analyses suggested linear associations between heavy occupational lifting and systolic blood pressure among participants using anti-hypertensives. Exposure to heavy occupational lifting tended to increase the incidence of hypertension (OR 1.30, 95% CI 0.97-1.73) among participants ≥ 50 years. Conclusions No associations were seen among the general population. Positive associations were seen among users of anti-hypertensives and participants ≥ 50 years, indicating these groups as vulnerable to increases in blood pressure when exposed to occupational lifting

Matre D, Nilsen KB, Katsifaraki M, Waage S, Pallesen S, and Bjorvatn B. Pain complaints are associated with quick returns and insomnia among Norwegian nurses, but do not differ between shift workers and day only workers. International Archives of Occupational and Environmental Health. 2020; 93(3):291-299.

<https://doi.org/10.1007/s00420-019-01481-w>

Abstract: PURPOSE: To determine whether common work schedule characteristics among Norwegian nurses were associated with subjective pain complaints. METHODS: A cross-sectional study in a sample of 1585 nurses, part of the longitudinal questionnaire-based cohort project 'Survey of Shift work, Sleep and Health' (SUSSH). Pain from six regions were assessed: 'headache', 'neck/shoulder/upper back', 'upper extremities', 'lower back', 'lower extremities', and 'abdomen'. Logistic and negative binomial regression (adjusted for age, sex, percentage of full-time equivalent, marital status and children living at home) were conducted where work schedule, number of night shifts last year, number of quick returns (QR) last year (< 11 h between shifts) and insomnia were predictors of localized pain, widespread pain and number of pain sites. RESULTS: Localized pain, widespread pain and number of pain sites were associated with insomnia (OR 2.06, 95% CI 1.66-2.55, OR 2.14, 95% CI 1.47-3.09, IRR 1.70, 95% CI 1.51-1.91, respectively). Work schedule and number of night shifts worked last year were not associated with any of the three pain measures. Number of QRs

worked last year tended to be associated with number of pain sites. CONCLUSION: The study did not support the hypothesis that non-daytime work schedules are associated with pain complaints. Neither was there support for the hypothesis linking number of night shifts, or the number of QRs, to pain complaints. Future studies should aim to determine the association between QRs and pain in more detail. Pain complaints were associated with insomnia

Mehdizadeh A, Vinel A, Hu Q, Schall MC, Jr., Gallagher S, and Sesek RF. Job rotation and work-related musculoskeletal disorders: a fatigue-failure perspective. Ergonomics. 2020; 63(4):461-476.

<https://doi.org/10.1080/00140139.2020.1717644>

Abstract: Job rotation is an organisational strategy that can be used, in part, to reduce occupational exposure to physical risk factors associated with work-related musculoskeletal disorders (MSDs). Recent studies, however, suggest that job rotation schedules may increase the overall risk of injury to workers included in the rotation scheme. We describe a novel optimisation framework evaluating the effectiveness of a job rotation scheme using the fatigue failure model of MSD development and a case study with real injury data. Results suggest that the effect of job rotation is highly-dependent on the composition of the job pool, and inclusion of jobs with higher risk results in a drastic decrease in the effectiveness of rotation for reducing overall worker risk. The study highlights that in cases when high-risk jobs are present, job redesign of those high risk tasks should be the primary focus of intervention efforts rather than job rotation. Practitioner summary: Job rotation is often used in industry as a method to 'balance' physical demands experienced by workers to reduce musculoskeletal disorder (MSD) risk. This article examines the efficacy of reducing MSDs through job rotation using numerical simulation of job rotation strategies and utilising the fatigue failure model of MSD development

Mohiuddin MM, Mizubuti GB, Haroutounian S, Smith SM, Rice ASC, Campbell F, et al. Adherence to Consolidated Standards of Reporting Trials (CONSORT) Guidelines for reporting safety outcomes in trials of medical cannabis and cannabis-based medicines for chronic noncancer pain: a systematic review.

Clinical Journal of Pain. 2020; 36(4):302-319.

<https://doi.org/10.1097/AJP.0000000000000807>

Abstract: OBJECTIVE: Current treatments for chronic pain have limited effectiveness and tolerability. With growing interest in the potential of cannabinoids, there is a need to inform risk-benefit considerations. Thus, this focused systematic review assesses the quality of safety assessment and reporting in chronic noncancer pain cannabinoid trials. METHODS: The protocol for this review has been published, and, registered in PROSPERO. We searched MEDLINE, Embase, The Cochrane Library, Scopus, and PsychINFO for double-blind, placebo-controlled, randomized controlled trials of cannabinoids for chronic pain, with a primary outcome related to pain. The primary review outcome is adherence to the 2004 Consolidated Standards of Reporting Trials (CONSORT) Harms extension. Secondary outcomes included type, reporting method, frequency and severity of adverse events (AEs), trial participant withdrawals, and reasons for withdrawals. RESULTS: In total, 43 studies (4436 participants) were included. Type of cannabinoid (number of studies) included nabiximols (12), dronabinol (8), nabilone (7), oral cannabis extract preparations (5), smoked tetrahydrocannabinol (5), vaporized tetrahydrocannabinol (3), novel synthetic cannabinoids (2), sublingual cannabis extract preparations (1). The median CONSORT score was 7. On average, 3 to 4 recommendations of the CONSORT guidelines were not being met in trials. Seventeen trials did not provide their method of AE assessment, 14 trials did not report on serious AEs and, 7 trials provided no quantitative data about AEs. DISCUSSION: Better harms assessment and reporting are needed in chronic pain cannabinoid trials. Improvements may be achieved through: expanded education/knowledge translation increased research regulation by ethics boards, funding agencies and journals, and greater emphasis on safety assessment and reporting throughout research training

Rizza R and Fioritti A. Is individual placement and support an "active" labor market policy? Psychiatric Rehabilitation Journal. 2020; 43(1):60-64.

<https://doi.org/10.1037/prj0000396>

Abstract: OBJECTIVE: The aim of this study was to propose individual placement and support (IPS) as an important component of

modern labor market policies and as a paradigm to be considered while drafting and adopting them. **BACKGROUND:** Modern European labor market policies, termed activation policies, aim to support a personal commitment to seek employment by linking welfare benefits to active engagement in job search. **METHOD:** In this essay, the authors describe European "activation policies," outline labor market regulations in Italy in the last 3 decades, and analyze core components of IPS in the light of labor policies. **FINDINGS:** IPS, which provides individual psychological and practical support, has become a highly successful method for helping people with mental disorders to reach competitive employment in Italy. It has been effective in many countries, regardless of local employment conditions and market regulations. Its effectiveness may be greater in places with weaker employment protection legislation and integration efforts and less generous disability benefits, as is the case in Italy. **Conclusions and Implications for Policies:** Labor market policies should carefully balance financial benefits, integration efforts, and individual support. They should include IPS for people with mental disorders. Modified versions of IPS may also be beneficial to nonpsychiatric unemployed populations. (PsycINFO Database Record (c) 2020 APA, all rights reserved)

Skovlund SV, Blafoss R, Sundstrup E, and Andersen LL. Association between physical work demands and work ability in workers with musculoskeletal pain: cross-sectional study. BMC Musculoskeletal Disorders. 2020; 21(1):166.

<https://doi.org/10.1186/s12891-020-03191-8> [open access]

Abstract: **BACKGROUND:** Musculoskeletal pain is common in the working population and may affect the work ability, especially among those with high physical work demands. This study investigated the association between physical work demands and work ability in workers with musculoskeletal pain. **METHODS:** Workers with physically demanding jobs (n = 5377) participated in the Danish Work Environment Cohort Study in 2010. Associations between physical work ability and various physical work demands were modeled using cumulative logistic regression analyses while controlling for possible confounders. **RESULTS:** In the fully adjusted model, bending and twisting/turning of the back more than a quarter of the workday (reference: less than a quarter of the workday) was associated with

higher odds of lower work ability in workers with low-back pain (OR: 1.38, 95% CI: 1.09-1.74) and neck-shoulder pain (OR: 1.29, 95% CI: 1.01-1.64). When adding up the different types of demands, being exposed to two or more physical work demands for more than a quarter of the workday was consistently associated with lower work ability. **CONCLUSIONS:** Work that involves high demands of the lower back seems especially problematic in relation to work ability among physical workers with musculoskeletal pain. Regardless of the specific type of physical work demand, being exposed to multiple physical work demands for more than a quarter of the workday was also associated with lower work ability

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