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

***Biswas A, Harbin S, Irvin E, Johnston H, Begum M, Tiong M, et al. Differences between men and women in their risk of work injury and disability: a systematic review. *American Journal of Industrial Medicine*. 2022; [epub ahead of print].**

<https://doi.org/10.1002/ajim.23364> [open access]

Abstract: BACKGROUND: Health responses associated with occupational exposures can vary between men and women. AIMS: This study reviewed the work injury and disability risks associated with similar types of occupational exposures for men and women within and across occupations. MATERIALS & METHODS: A systematic review was undertaken of observational studies published between 2009 and 2019. Studies were required to empirically compare men and women for associations between occupational exposures and work injury or disability outcomes. Included studies were appraised for methodological quality and medium to high rated studies were compared for risk differences between men and women. RESULTS: Of 14,006 records identified, 440 articles were assessed for methodological quality, and 33 medium to high rated studies were included and reviewed. Among all occupations, the association between physical exposures, job demands, noise, and repetitive tasks, and injury risk were stronger among men. The relationship between repetitive tasks and sickness absence was stronger among women. Most studies examining psychological exposures found no risk differences for men and women across occupations. Men were at higher injury risk in certain occupations in primary and secondary industry sectors involving physical exposures and some chemical/biological exposures. Women were at higher injury risk for the physical demands and repetitive tasks of health care and

aluminum production occupations. **CONCLUSION:** This review found that men and women can have different work injury and disability risks, both across and within the same occupations, for some physical exposures and to a lesser extent for some chemical and biological exposures. These differences might be a result of occupation-specific task differences

***Gallagher E, Alvarez E, Jin L, Guenter D, Hatcher L, and Furlan A. Patient contracts for chronic medical conditions: scoping review. Canadian Family Physician. 2022; 68(5):e169-e177.**

<https://doi.org/10.46747/cfp.6805e169> [open access]

Abstract: **OBJECTIVE:** To describe how and why patient contracts are used for the management of chronic medical conditions. **DATA SOURCES:** A scoping review was conducted in the following databases: MEDLINE, Embase, AMED, PsycInfo, Cochrane Library, CINAHL, and Nursing & Allied Health. Literature from 1997 to 2017 was included. **STUDY SELECTION:** Articles were included if they were written in English and described the implementation of a patient contract by a health care provider for the management of a chronic condition. Articles had to present an outcome as a result of using the contract or an intervention that included the contract. **SYNTHESIS:** Of the 7528 articles found in the original search, 76 met the inclusion criteria for the final review. Multiple study types were included. Extensive variety in contract elements, target populations, clinical settings, and cointerventions was found. Purposes for initiating contracts included behaviour change and skill development, including goal development and problem solving; altering beliefs and knowledge, including motivation and perceived self-efficacy; improving interpersonal relationships and role clarification; improving quality and process of chronic care; and altering objective and subjective health indices. How contracts were developed, implemented, and assessed was inconsistently described. **CONCLUSION:** More research is required to determine whether the use of contracts is accomplishing their intended purposes. Questions remain regarding their rationale, development, and implementation

Cabegi de Barros F, Moriguchi CS, and de Oliveira Sato T. Effects of workstation adjustment to reduce postural exposure and perceived discomfort among office workers: cluster randomized controlled trial. Applied Ergonomics. 2022; 102:103738.

<https://doi.org/10.1016/j.apergo.2022.103738>

Abstract: This study aimed to evaluate the effects of workstation adjustment to reduce postural exposure and perceived discomfort among office workers in a cluster randomized controlled trial. Experimental (EG, n = 31) and control groups (CG, n = 30) were compared before (pre-intervention), immediately (post-intervention), and 3 months after (follow up) the intervention. EG received workstation adjustments and CG did not received the intervention. Postural exposure of head, upper back and upper arms was objectively measured by inclinometers. Overall level of perceived discomfort for the whole body was evaluated using a visual analogue scale (0-100 mm). EG showed a statistically significant reduction on the head (pre: 10.1°, SD 5.7°; post: 6.6°, SD 4.7°) and upper back flexion (pre:

15.4°, SD 10.7°; post: 10.4°, SD 8.4°) from pre to post-intervention. EG also showed a statistically significant reduction from pre (50.7°, SD 9.5°) to post-intervention (42.1°, SD 7.6°) and from pre to follow up (41.6°, SD 6.5°) on upper arm elevation. CG did not show any difference between evaluations. Perceived discomfort increased 7.2 (SD 2.0) mm in CG and decreased 22.1 (SD 2.2) mm in EG between pre and post intervention. The variation between pre intervention and follow up was 4.5 (SD 1.2) mm increase for the CG and 24.1 (SD 1.5) mm of reduction for the EG ($P < 0.01$). There was no significant difference for the post intervention and follow up for both groups ($P > 0.05$). The results show evidence of the workstation adjustment to reduce postural exposure and perceived discomfort among office workers.

Bjorkenstam E, Helgesson M, Gustafsson K, Virtanen M, Hanson LLM, and Mittendorfer-Rutz E. Sickness absence due to common mental disorders in young employees in Sweden: are there differences in occupational class and employment sector? *Social Psychiatry and Psychiatric Epidemiology*. 2022; 57(5):1097-1106.

<https://doi.org/10.1007/s00127-021-02152-3> [open access]

Abstract: Background: A large proportion of sickness absence (SA) in young adults is due to common mental disorders (CMDs). Still studies on CMD-related SA in young workers are lacking, especially studies for those employed in the private sector. The current study investigated the associations between sector of employment, occupational class and SA due to CMDs. In addition, associations between type of employment branch and SA due to CMDs within each sector were examined. Methods: This population-based longitudinal cohort study included 663,583 employees, 19-29 years, residing in Sweden in 2009. Employment sector (i.e., private/public) and occupational class (non-manual/manual workers) were measured in 2009. Risk estimates of SA due to CMDs, between 2010 and 2016, were calculated as Hazard Ratios (HR) with 95% confidence intervals (CI), using Cox regression analysis. Results: Sector of employment was associated with SA due to CMDs, such that public sector workers had an elevated risk when compared with private sector employees (adjusted HR: 1.31 (95% CI 1.29-1.33)). Moreover, manual workers had a slightly elevated risk for SA due to CMDs compared to non-manual workers. Within the private sector, in both manual and non-manual workers, those employed in education and health and social services evidenced the highest rates and risks of SA due to CMDs. Conclusion: Sector of employment and occupational class play a role in SA due to CMDs in young employees. These findings should be considered when identifying high-risk groups for SA in the young working population.

Bussink H, Vervliet T, and ter Weel B. The short-term effect of the COVID-19 crisis on employment probabilities of labour-market entrants in the Netherlands. *Economist*. 2022; 170(2):279-303.

<https://doi.org/10.1007/s10645-022-09406-8> [open access]

Abstract: This research documents employment opportunities of labour-market entrants during the COVID-19 crisis in the Netherlands. Two recent cohorts of graduates are studied

and compared to two pre-COVID-19 cohorts: the 2019 cohort was unexpectedly hit by the COVID-19 crisis about six months after entering the labour market and the 2020 cohort graduated and entered the labour market in the midst of a lockdown. Our estimation results suggest short-term effects of lockdowns on employment probabilities, specifically for relatively lower educated labour-market entrants. The effects appear to be relatively small in size and seem to fade when the lockdown measures are eased. Men seem to have suffered more than women and some sectors are hit harder than others, which could result in short-run mismatches. Overall the effects appear to be less severe than during an economic recession, which is most likely due to the tight labour market and the strong measures taken by the government to mitigate the labour-market impact of the COVID-19 crisis

Gariepy G, Danna SM, Hawke L, Henderson J, and Iyer SN. The mental health of young people who are not in education, employment, or training: a systematic review and meta-analysis. *Social Psychiatry and Psychiatric Epidemiology*. 2022; 57(6):1107-1121.

<https://doi.org/10.1007/s00127-021-02212-8> [open access]

Abstract: Purpose There are increasing concerns about the intersection between NEET (not in education, employment, or training) status and youth mental ill-health and substance use. However, findings are inconsistent and differ across types of problems. This is the first systematic review and meta-analysis (PROSPERO-CRD42018087446) on the association between NEET status and youth mental health and substance use problems. Methods We searched Medline, EMBASE, Web of Science, ERIC, PsycINFO, and ProQuest Dissertations and Theses (1999–2020). Two reviewers extracted data and appraised study quality using a modified Newcastle–Ottawa Scale. We ran robust variance estimation random-effects models for associations between NEET and aggregate groups of mental ill-health and substance use measures; conventional random-effects models for associations with individual mental/substance use problems; and subgroup analyses to explore heterogeneity. Results We identified 24 studies from 6,120 references. NEET status was associated with aggregate groups of mental ill-health (OR 1.28, CI 1.06–1.54), substance use problems (OR 1.43, CI 1.08–1.89), and combined mental ill-health and substance use measures (OR 1.38, CI 1.15–1.64). Each disaggregated measure was associated with NEET status [mood (OR 1.43, CI 1.21–1.70), anxiety (OR 1.55, CI 1.07–2.24), behaviour problems (OR 1.49, CI 1.21–1.85), alcohol use (OR 1.28, CI 1.24–1.46), cannabis use (OR 1.62, CI 1.07–2.46), drug use (OR 1.99, CI 1.19–3.31), suicidality (OR 2.84, CI 2.04–3.95); and psychological distress (OR 1.10, CI 1.01–1.21)]. Longitudinal data indicated that aggregate measures of mental health problems and of mental health and substance use problems (combined) predicted being NEET later, while evidence for the inverse relationship was equivocal and sparse. Conclusion Our review provides evidence for meaningful, significant associations between youth mental health and substance use problems and being NEET. We, therefore, advocate for mental ill-health prevention and early intervention and integrating vocational supports in youth mental healthcare.

Hong JP, Lee CH, Lee YH, Escorpizo R, Chiang YC, and Liou TH. Functional status and return to work in people with major depression: a 3-year national follow-up study. *Social Psychiatry and Psychiatric Epidemiology*. 2022; 57(6):1179-1188.

<https://doi.org/10.1007/s00127-022-02240-y>

Abstract: Purpose: Major depressive disorder (MDD) affects a person's function of daily activities, including work participation. Such functional impairments often persist even when other symptoms of MDD are remitted. Increasing evidence highlights the health-promoting effects of returning to work (RTW) in various diseases. However, limited data are available regarding the impact of return to work on functional recovery in MDD. We explored the association between RTW and functional improvements in people with MDD using a large nationally representative database and a 3-year follow-up. Methods: Data of people with an MDD diagnosis were selected from the Taiwan Data Bank of Persons with disability for the period between July 11, 2012, and October 31, 2018. We included 4038 adults aged 18-64 years. The World Health Organization Disability Assessment Schedule 2.0 was used for functional assessment. The association between RTW and functional improvements was investigated using a multivariable regression analysis adjusted for confounding variables. Results: Women aged ≥ 45 years with a lower education level were vulnerable to prolonged unemployment. RTW was significantly associated with better functional improvements in cognition, mobility, self-care, getting along, life activity, and participation than unemployment. Conclusions: RTW was positively associated with functional improvements in patients with MDD. A referral system targeting re-employment may be suggested during MDD treatment, especially for individuals at risk of prolonged unemployment.

Jakobsen MD, Vinstrup J, and Andersen LL. Factors associated with high physical exertion during healthcare work: cross-sectional study among healthcare workers. *Work*. 2022; 71(4):881-888.

<https://doi.org/10.3233/WOR-213647>

Abstract: BACKGROUND: High physical exertion during healthcare work is a documented risk factor for musculoskeletal pain, long term sickness absence and disability pension. Understanding the underlying factors of physical exertion is important to make the necessary preventive efforts in the working environment. OBJECTIVE: This study investigates factors associated with high physical exertion during healthcare work. METHODS: A total of 2047 Danish health care workers replied to a questionnaire about work and health. Associations (odds ratios; OR) of physical exertion (outcome variable) with the number of patients and self-reliant patients, frequency and type of assistive device use, BMI, leisure time activity, smoking, and age were modelled using mutually adjusted binary logistic regression. RESULTS: Factors associated with high physical exertion (OR and 95% CI) were high frequency of daily patient transfers 1.35 (1.23 - 1.48), less self-reliant patients 0.74 (0.62 - 0.89), less frequent use of necessary assistive devices 1.82 (1.50 - 2.21), as well as more frequent use of sliding pieces 1.23 (1.04 - 1.46), wheelchairs 1.23 (1.02 - 1.49), bed adjustments 0.88 (0.77 - 1.00) and intelligent beds 0.83 (0.71 - 0.95) during patient transfer. Age and lifestyle factors (BMI,

smoking, and leisure time physical activity) were not associated with high physical exertion. CONCLUSIONS: The character of patient transfer specific healthcare work is associated with increased odds for high physical exertion whereas life-style factors are not. Thus, proper use of specific assistive devices and avoiding uneven distribution of difficult patients through appropriate planning may be protective strategies for lowering physical exertion during healthcare work

Kyron MJ, Ridders W, Bartlett J, Renehan E, Hafekost K, Baigent M, et al. Mental health and wellbeing of Australian police and emergency services employees. Archives of Environmental & Occupational Health. 2022; 77(4):282-292.

<https://doi.org/10.1080/19338244.2021.1893631>

Abstract: Answering the Call, the Australian National Police and Emergency Services Mental Health and Wellbeing Study, surveyed 14,868 Australian ambulance, fire and rescue, police, and state emergency service employees. Emergency services personnel had lower rates of mental wellbeing and higher rates of psychological distress and probable PTSD than the general adult population. Overall 30% had low wellbeing, 21% had high and 9% had very high psychological distress, and 10% had probable PTSD. An estimated 5% had suicidal ideation and 2% had a suicide plan in the past 12 months, while 16% binge drink at least weekly. Only one in five of those with very high psychological distress or probable PTSD felt they received adequate support for their condition. These findings highlight the risk of mental health conditions associated with work in the emergency services sector.

Rosemberg MS, Granner JR, Li WV, Adams M, and Militzer MA. Intervention needs among hotel employees and managers. Work. 2022; 71(4):1063-1071.

<https://doi.org/10.3233/WOR-205060>

Abstract: BACKGROUND: Hotel room cleaners are disproportionately exposed to hazards that increase risk for poor health outcomes. Interventions are needed to improve the health of these workers. Yet we know little about the expressed needs of hotel room cleaners nor do we know about managers' perspectives on how to best optimize employee health.

OBJECTIVE: We aimed to develop an understanding of perceived intervention needs among hotel room cleaners and to assess managers' views on the acceptability of the proposed interventions.

METHODS: We used a community-based approach to recruit study participants. We conducted five focus groups among hotel room cleaners and individual interviews with hotel managers. Interviews were audio-recorded, transcribed, and analyzed using content analysis. RESULTS: The workers expressed needs centered on pay, workload, appreciation, ergonomics, chemical and biological hazards, nutrition, smoking cessation, exercise, mental health and stress management. In addition to echoing the workers' expressed needs, managers emphasized employee retention and financial literacy.

CONCLUSIONS: To our knowledge, this is the first paper to include both workers' and managers' accounts on intervention approaches that will optimize health and wellbeing. This paper offers a guide for future program development among hospitality workers. Effective

interventions need to be integrated, encompassing the individual, intrapersonal, organizational, and policy levels

Rubery PT, Ramirez G, D'Agostino CR, Vasalos K, and Thirukumaran C. A workplace wellness program at an academic health center influences employee health, satisfaction, productivity and the rate of workplace injury. *International Archives of Occupational & Environmental Health*. 2022; [epub ahead of print].

<https://doi.org/10.1007/s00420-022-01865-5>

Abstract: Purpose: Workplace wellness (WP) programs are an employer strategy to improve employee health and satisfaction. Their impact on productivity and benefit expense remains unclear. This study examines the association of a voluntary WP at an academic health center with both employee metrics and employer costs. Methods: We retrospectively reviewed prospectively collected data from January 2016 to April 2018 for employees who voluntarily underwent screening for a WP at an academic medical center. We used their demographic, social, work, and clinical data to address the central research question. The primary outcomes included wellness measures from the Patient-Reported Outcomes Measurement Information System (PROMIS), secondary wellness outcomes such as body mass index, job-related outcomes such as job satisfaction, and workers' compensation metrics such as the claim amount. The key independent variables were whether an observation was from before or after the WP. For workers' compensation metrics, additional key independent variables were intervention/control group, and an interaction between the before/after and intervention/control variables. We conducted univariate and bivariate/unadjusted analyses, and estimated multivariable linear, logistic, and gamma regression models that also controlled for confounders. Results: The study included 370 employees. Participation in the program was associated with significant improvements in the PROMIS pain interference, fatigue and sleep quality domains. Hip circumference diminished, and functional movement outcomes were improved. Job satisfaction improved by 4.4 percentage points (95% Confidence Interval [CI]: 0.3-8.5, $p = 0.04$) and self-reported productivity by 14.5 percentage points (95% Confidence Interval [CI]: 9.5-19.5, $p < 0.001$). The likelihood of a new compensation claim during the 12-month follow-up period fell by 10.1% (95% Confidence Interval [CI]: - 15.5 to - 4.7, $p < 0.001$). However, the value of a new claim was unchanged. Conclusion: Employees who completed a WP at an academic medical center demonstrated improvements in several recognized patient-reported outcome measures, in job satisfaction and self-reported productivity, a decrease in hip circumference, an improvement in functional motion and a decreased rate of compensable injury.

Thompson J and Cruz-Gambardella C. Development of a computational policy model for comparing the effect of compensation scheme policies on recovery after workplace injury. *Journal of Occupational Rehabilitation*. 2022; [epub ahead of print].

<https://doi.org/10.1007/s10926-022-10035-w> [open access]

Abstract: Introduction The direct comparison of real-world workers' compensation scheme management policies and their impact on aspects of scheme performance such as health and return to work outcomes, financial sustainability, and client experience metrics is made difficult through existing differences in scheme design that go beyond the factors of interest to the researcher or policymaker. Disentangling effects that are due purely to the result of policy and structural differences between schemes or jurisdictions to determine 'what works' can be difficult. Method We present a prototype policy exploration tool, 'WorkSim', built using an agent-based model and designed to enable workers' compensation system managers to directly compare the effect of simulated policies on the performance of workers compensation systems constructed using agreed and transparent principles. Results The utility of the model is demonstrated through and case-study comparison of overall scheme performance metrics across 6 simple policy scenarios. Discussion Policy simulation models of the nature described can be useful tools for managers of workplace compensation and rehabilitation schemes for trialing policy and management options ahead of their real-world implementation.

Verhoef JAC, Bal MI, Roelofs PDDM, Borghouts JAJ, Roebroek ME, and Miedema HS. Effectiveness and characteristics of interventions to improve work participation in adults with chronic physical conditions: a systematic review. *Disability and Rehabilitation*. 2022; 44(7):1007-1022.

<https://doi.org/10.1080/09638288.2020.1788180>

Abstract: PURPOSE: Chronic physical conditions often negatively affect work participation. The objective of this systematic review is to investigate the effectiveness and characteristics of vocational rehabilitation interventions for people with a chronic physical condition. METHODS: Searches in five databases up to April 2020 identified 30 studies meeting our inclusion criteria. Two reviewers independently assessed and extracted data. The Grading of Recommendation, Assessment, Development and Evaluation (GRADE) framework was used to evaluate quality of evidence for three outcome measures related to work participation. RESULTS: All vocational rehabilitation interventions consisted of multiple components, but their characteristics varied widely. Analysis of 22 trials yielded a moderate positive effect with moderate certainty of interventions on work status; analysis of five trials with low risk of bias showed a large positive effect with moderate certainty (risk ratio 1.33 and 1.57, respectively). In addition, in eight studies we found a moderate to small positive effect with low certainty on work attitude (standardized mean difference = 0.59 or 0.38, respectively). We found no effect on work productivity in nine studies. CONCLUSION: The systematic review of the literature showed positive effects of vocational rehabilitation interventions on work status and on work attitude; we found no effect on work productivity. Implications for

rehabilitation In rehabilitation, addressing work participation of persons with a chronic physical condition using targeted interventions is beneficial to improve or sustain work participation, irrespective of the intervention characteristics and diagnosis. Interventions that include multiple components and offer individual support, whether or not combined with group sessions, are likely to be more effective in improving work participation in persons with a chronic physical condition. The overview of vocational interventions in this systematic review may assist healthcare professionals in making informed decisions as to which intervention to provide. Vocational rehabilitation, as well as studies on work participation in chronic disease, should include a long follow-up period to explore if work participation is sustainable and contributes to health and wellbeing

Wallinder Y. Otherness in the workplace among highly skilled labour migrants: Swedes in Germany and the UK. *Work, Employment and Society*. 2022; 36(2):253-270.

<https://doi.org/10.1177/09500170211024444> [open access]

Abstract: The conditions for intra-European labour mobility have changed significantly during recent decades, mainly due to the European Single Market. Despite this, internationally mobile and highly skilled intra-EU migrants from West to West have not received enough attention in the sociology of work. The present article focuses on highly skilled labour migrants with a university degree from Sweden, currently working in Germany or the UK. Swedish migrants feel they challenge specific norms related to hierarchies in the workplace, behaving according to their own 'taken-for-granted' norms concerning the ways in which work is organized and tasks are assigned. Their privileged position as educated Swedish migrants is an important part of their self-image and enables them to challenge norms. Furthermore, they also deal with self-perceived otherness while making sense of their experiences of contradictions and norm-breaking. The findings highlight their self-definitions, according to which they are simultaneously (by default) insiders and/or (superior) outsiders.

Zuidema C, Austin E, Cohen MA, Kasner E, Liu L, Busch Isaksen T, et al. Potential impacts of Washington State's wildfire worker protection rule on construction workers. *Annals of Work Exposures and Health*. 2022; 66(4):419-432.

<https://doi.org/10.1093/annweh/wxab115> [open access]

Abstract: Driven by climate change, wildfires are increasing in frequency, duration, and intensity across the Western United States. Outdoor workers are being exposed to increasing wildfire-related particulate matter and smoke. Recognizing this emerging risk, Washington adopted an emergency rule and is presently engaged in creating a permanent rule to protect outdoor workers from wildfire smoke exposure. While there are growing bodies of literature on the exposure to and health effects of wildfire smoke in the general public and wildland firefighters, there is a gap in knowledge about wildfire smoke exposure among outdoor workers generally and construction workers specifically—a large category of outdoor workers in Washington totaling 200,000 people. Several data sources were linked in this study—including state-collected employment data and national ambient air quality data—to gain

insight into the risk of PM_{2.5} exposure among construction workers and evaluate the impacts of different air quality thresholds that would have triggered a new Washington emergency wildfire smoke rule aimed at protecting workers from high PM_{2.5} exposure. Results indicate the number of poor air quality days has increased in August and September in recent years. Over the last decade, these months with the greatest potential for particulate matter exposure coincided with an annual peak in construction employment that was typically 9.4-42.7% larger across Washington counties (one county was 75.8%). Lastly, the 'encouraged' threshold of the Washington emergency rule (20.5 µg m⁻³) would have resulted in 5.5 times more days subject to the wildfire rule on average across all Washington counties compared to its 'required' threshold (55.5 µg m⁻³), and in 2020, the rule could have created demand for 1.35 million N-95 filtering facepiece respirators among construction workers. These results have important implications for both employers and policy makers as rules are developed. The potential policy implications of wildfire smoke exposure, exposure control strategies, and data gaps that would improve understanding of construction worker exposure to wildfire smoke are also discussed.

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