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

***Havaei F, Tang X, Smith P, Boamah SA, and Frankfurter C. The association between mental health symptoms and quality and safety of patient care before and during COVID-19 among Canadian nurses. *Healthcare*. 2022; 10(2):314.**

<https://doi.org/10.3390/healthcare10020314> open access

Abstract: (1) Background: While the association between nurse mental health and quality and safety of patient care delivery was well documented pre-pandemic, fewer research studies have examined this relationship in the context of COVID-19. This study examines the impact of various mental health symptoms experienced by nurses on quality and safety before and during the COVID-19 pandemic; (2) Methods: A secondary analysis of cross-sectional survey data from 4729 and 3585 nurses in one Canadian province between December 2019 and June-July 2020 was conducted. Data were analyzed using between group difference tests and logistic regression; (3) Results: Compared to pre-COVID-19, during COVID-19 nurses reported a higher safety grade, a greater likelihood of recommending their units for care and lower quality of nursing care. Most mental health symptoms were higher during COVID-19 and higher levels of mental health symptoms were correlated with lower ratings of quality and safety both pre- and during COVID-19; (4) Conclusion: Mental health symptoms have implications for nurses' quality and safety of patient care delivery, with the association between mental health symptoms and quality and safety following a dose-response relationship before and during COVID-19. These findings suggest that it is worthwhile for nurse mental health symptoms to be included as hospital level performance metrics.

***Orchard C, Smith PM, and Kromhout H. Gender differences in authorship prior to and during the COVID-19 pandemic in research submissions to Occupational and Environmental Medicine (2017-2021). Occupational & Environmental Medicine. 2022; [epub ahead of print].**

<https://doi.org/10.1136/oemed-2021-107915> [open access]

Abstract: OBJECTIVE: To explore whether the COVID-19 pandemic has impacted productivity of female academics in the field of occupational and environmental health, by examining trends in male and female authorship of submissions during and prior to the COVID-19 pandemic in Occupational and Environmental Medicine. METHODS: Administrative data on submissions between January 2017 and November 2021 were obtained through databases held at BMJ journals. Author gender was identified using an existing algorithm based on matching names to social media accounts. The number and proportion of female and male primary (first) and senior (last) authors were examined for each quarter, and the average change in share of monthly submissions from male authors in the months since the pandemic compared with corresponding months prior to the pandemic were identified using regression models estimating least squares means. RESULTS: Among 2286 (64.7%) and 2335 (66.1%) manuscripts for which first and last author gender were identified, respectively, 49.3% of prepandemic submissions were from male first authors, increasing to 55.4% in the first year of the pandemic (difference of 6.1%, 95% CI 1.3% to 10.7%), before dropping to 46.6% from April 2021 onwards. Quarterly counts identified a large increase in submissions from male authors during the first year after the onset of the pandemic, and a smaller increase from female authors. The proportion of male last authors did not change significantly during the pandemic. CONCLUSIONS: These findings suggest that there has been an increase in male productivity during the COVID-19 pandemic within the field of occupational and environmental health research that is present to a lesser extent among women

***Sud A, Buchman DZ, Furlan AD, Selby P, Spithoff SM, and Upshur REG. Chronic pain and opioid prescribing: three ways for navigating complexity at the clinical-population health interface. American Journal of Public Health. 2022; 112(S1):S56-S65.**

<https://doi.org/10.2105/AJPH.2021.306500> [open access]

Abstract: Clinically focused interventions for people living with pain, such as health professional education, clinical decision support systems, prescription drug monitoring programs, and multidisciplinary care to support opioid tapering, have all been promoted as important solutions to the North American opioid crisis. Yet none have so far delivered substantive beneficial opioid-related population health outcomes. In fact, while total opioid prescribing has leveled off or reduced in many jurisdictions, population-level harms from opioids have continued to increase dramatically. We attribute this failure partly to a poor recognition of the epistemic and ethical complexities at the interface of clinical and population health. We draw on a framework of knowledge networks in wicked problems to identify 3 strategies to help navigate these complexities: (1) designing and evaluating clinically focused interventions as complex interventions, (2) reformulating evidence to make

population health dynamics apparent, and (3) appealing to the inseparability of facts and values to support decision-making in uncertainty. We advocate that applying these strategies will better equip clinically focused interventions as complements to structural and public health interventions to achieve the desired beneficial population health effects. (Am J Public Health. 2022;112(S1):S56-S65. <https://doi.org/10.2105/AJPH.2021.306500>)

Acheampong T and Kemp AG. Health, safety and environmental (HSE) regulation and outcomes in the offshore oil and gas industry: performance review of trends in the United Kingdom Continental Shelf. Safety Science. 2022; 148:105634.

<https://doi.org/10.1016/j.ssci.2021.105634>

Asfaw A. Cost of lost work hours associated with the COVID-19 pandemic-United States, March 2020 through February 2021. American Journal of Industrial Medicine. 2022; 65(1):20-29.

<https://doi.org/10.1002/ajim.23307> [open access]

Abstract: INTRODUCTION: Of the 22.8 million coronavirus disease 2019 (COVID-19) cases recorded in the United States as of March 21, 2021 with age information, three-fourths were in the workingage group, indicating the potentially high economic impact of the pandemic. This study estimates the cost of lost work hours associated with the COVID-19 pandemic between March 2020 through February 2021. METHOD: I used a before-and-after analysis of data from the 2017-2021 Current Population Survey to estimate the costs of lost work hours due to economic, workers' own health, and other reasons, from the COVID-19 pandemic. RESULTS: Across March 2020 through February 2021 (a year since the start of the pandemic in the United States), the estimated cost of lost work hours associated with the COVID-19 pandemic among US full-time workers was \$138 billion (95% confidence interval [CI]: \$73.4 billion-\$202.46 billion). Shares of the costs attributed to economic, workers' own health, and other reasons were 33.7%, 13.7%, and 52.6%, respectively. CONCLUSION: The \$138 billion cost of lost work hours associated with the COVID-19 pandemic during March 2020 through February 2021 highlights the economic consequences of the pandemic, as well as indicating the potential benefit of public health and safety interventions used to mitigate COVID-19 spread

Burr H, Lange S, Freyer M, Formazin M, Rose U, Nielsen ML, et al. Physical and psychosocial working conditions as predictors of 5-year changes in work ability among 2078 employees in Germany. International Archives of Occupational & Environmental Health. 2022; 95(1):153-168.

<https://doi.org/10.1007/s00420-021-01716-9> [open access]

Abstract: Objective: To examine 5-year prospective associations between working conditions and work ability among employees in Germany. Methods: A cohort study (2011/2012-2017), based on a random sample of employees in employments subject to payment of social contributions aged 31-60 years (Study on Mental Health at Work; S-MGA; N = 2,078),

included data on physical and quantitative demands, control (influence, possibilities for development, control over working time), relations (role clarity and leadership quality) and work ability (Work Ability Index, WAI; subscale 'subjective work ability and resources'). Data were analysed using linear regression. Results: Physical demands and control were associated with small 5-year changes in work ability ($\Delta R^2 = 1\%$). Among the subgroup of employees with ≥ 25 sickness days, possibilities for development, control and quality of leadership were associated with changes in work ability ($\Delta R^2 = 8\%$). Conclusions: The impact of working conditions on long term changes in work ability seems to be negligible. However, in vulnerable subpopulations experiencing poor health, working conditions may be associated to a larger extent to work ability over this time span.

Deady M, Collins DAJ, Johnston DA, Glozier N, Calvo RA, Christensen H, et al. The impact of depression, anxiety and comorbidity on occupational outcomes. Occupational Medicine. 2022; 72(1):17-24.

<https://doi.org/10.1093/occmed/kgab142>

Abstract: BACKGROUND: Anxiety and depression account for considerable cost to organizations, driven by both presenteeism (reduced performance due to attending work while ill) and absenteeism. Most research has focused on the impact of depression, with less attention given to anxiety and comorbid presentations. AIMS: To explore the cross-sectional relationship between depression and anxiety (individually and comorbidly) on workplace performance and sickness absence. METHODS: As part of a larger study to evaluate a mental health app, 4953 working Australians were recruited. Participants completed in-app assessment including demographic questions, the Patient Health Questionnaire-9, two-item Generalized Anxiety Disorder and questions from the World Health Organization Health and Work Performance Questionnaire. Cut-off scores were used to establish probable cases of depression alone, anxiety alone and comorbidity. RESULTS: Of the total sample, 7% met cut-off for depression only, 13% anxiety only, while 16% were comorbid. Those with comorbidity reported greater symptom severity, poorer work performance and more sickness absence compared to all other groups. Presenteeism and absenteeism were significantly worse in those with depression only and anxiety only compared to those with non-clinical symptom levels. Although those with depression alone tended to have poorer outcomes than the anxiety-only group, when sample prevalence rates were considered, the impact on presenteeism was comparable. CONCLUSIONS: Workplace functioning is heavily impacted by depression and anxiety both independently and where they co-occur. While comorbidity and more severe depression presentations stand out as impairing, workplace interventions should also prioritize targeting of anxiety disorders (and associated presenteeism) given their high population prevalence

Dong XS, Brooks RD, Rodman C, Rinehart R, and Brown S. Pain and prescription opioid use among US construction workers: findings from the 2011 - 2018 medical expenditure panel survey. American Journal of Public Health. 2022; 112(S1):S77-S87.

<https://doi.org/10.2105/AJPH.2021.306510>

Abstract: Objectives. To examine prescription opioid and nonopioid analgesic use among US construction workers and their associations with pain conditions and sociodemographic factors. Methods. We analyzed data for about 9000 (weighted 11.5 million per year) construction workers who responded to the Medical Expenditure Panel Survey from 2011 to 2018. We applied both descriptive statistics and multiple logistic regression procedures in the analyses. Results. An estimated 1.2 million (10.0%) of construction workers used prescription opioid analgesics annually. The adjusted odds of prescription opioid use were significantly higher for workers suffering from work-related injuries (adjusted odds ratio [AOR] = 3.82; 95% confidence interval [CI] = 2.72, 5.37), non-work-related injuries (AOR = 3.37; 95% CI = 2.54, 4.46), and musculoskeletal disorders (AOR = 2.31; 95% CI = 1.80, 2.95) after we controlled for potential confounders. Adjusted odds of prescription opioid use were also higher among workers with poorer physical health (AOR = 1.95; 95% CI = 1.42, 2.69) or mental health disorders (AOR = 1.95; 95% CI = 1.41, 2.68). Conclusions. Work- and non-work-related injuries and musculoskeletal disorders significantly increased prescription opioid use among construction workers. To prevent opioid use disorders, multipronged strategies should be approached. (Am J Public Health. 2022;112(S1):S77-S87. <https://doi.org/10.2105/AJPH.2021.306510>).

Essl-Maurer R, Flamm M, Hosl K, Osterbrink J, and Zee-Neuen A. Absenteeism and associated labour costs according to depressive symptom severity in the German general population: why preventive strategies matter. International Archives of Occupational & Environmental Health. 2022; 95(2):409-418.

<https://doi.org/10.1007/s00420-021-01788-7> [open access]

Abstract: Purpose: Depression is a highly prevalent mental health condition with substantial individual, societal and economic consequences. This study focussed on the association of depressive symptom severity with absenteeism duration and employer labour costs. Methods: Using cross-sectional data from the German Health Update 2014/2015, multivariable zero-inflated Poisson regression (ZIP) models explored the association of depressive symptom severity (8-item depression patient health questionnaire-PHQ-8), with absenteeism weeks during 12 months in men and women working full- or part-time. The predicted sick leave weeks were multiplied by mean average labour costs. Results: The sample consisted of 12,405 persons with an average sick leave of 1.89 weeks (SD 4.26). Fifty-four % were women and 57% were between 40 and 59 years of age. In men and women, mild, moderate, moderately severe and severe depressive symptoms were associated with a significant factor increase in sick leave weeks compared to persons with no or minimal symptoms. Labour costs increased with increasing symptom severity from € 1468.22 for men with no or minimal depressive symptoms to € 7190.25 for men with severe depressive symptoms and from € 1045.82 to € 4306.30 in women, respectively. Conclusion: The present results indicate that increasing depressive symptom severity is associated with increasing absenteeism and employer costs. They emphasize the need for implementation, realignment

or extension of professional work-site health promotion programmes aiming at the improvement and maintenance of employee health and the reduction of labour costs associated with depression-related sick leave.

Galea N, Powell A, Salignac F, Chappell L, and Loosemore M. When following the rules is bad for wellbeing: the effects of gendered rules in the Australian construction industry. *Work, Employment and Society*. 2022; 36(1):119-138.

<https://doi.org/10.1177/0950017020978914> [open access]

Hoff A, Poulsen RM, Fisker J, Hjorthoj C, Rosenberg N, Nordentoft M, et al. Integrating vocational rehabilitation and mental healthcare to improve the return-to-work process for people on sick leave with depression or anxiety: results from a three-arm, parallel randomised trial. *Occupational & Environmental Medicine*. 2022; 79(2):134-142.

<https://doi.org/10.1136/oemed-2021-107894> [open access]

Abstract: OBJECTIVE: The aim of this study was to investigate an integrated mental healthcare and vocational rehabilitation intervention to improve and hasten the process of return-to-work of people on sick leave with anxiety and depression. METHODS: In this three-arm, randomised trial, participants were assigned to (1) integrated intervention (INT), (2) improved mental healthcare (MHC) or (3) service as usual (SAU). The primary outcome was time to return-to-work measured at 12-month follow-up. The secondary outcomes were time to return-to-work measured at 6-month follow-up; levels of anxiety, depression, stress symptoms, and social and occupational functioning at 6 months; and return-to-work measured as proportion in work at 12 months. RESULTS: 631 individuals were randomised. INT yielded a higher proportion in work compared with both MHC (56.2% vs 43.7%, $p=0.012$) and SAU (56.2% vs 45%, $p=0.029$) at 12-month follow-up. We found no differences in return-to-work in terms of sick leave duration at either 6-month or 12-month follow-up, with the latter being the primary outcome. No differences in anxiety, depression or functioning between INT, MHC and SAU were identified, but INT and MHC showed lower scores on Cohen's Perceived Stress Scale compared with SAU at 12-month follow-up. CONCLUSIONS: Although INT did not hasten the process of return-to-work, it yielded better outcome with regard to proportion in work compared with MHC and SAU. The findings suggest that INT compared with SAU is associated with a few, minor health benefits. Overall, INT yielded slightly better vocational and health outcomes, but the clinical significance of the health advantage is questionable. TRIAL REGISTRATION NUMBER: NCT02872051

Hultqvist J, Bjerkeli P, Hensing G, and Holmgren K. Does a brief work-stress intervention prevent sick-leave during the following 24 months? A randomized controlled trial in Swedish primary care. *Work*. 2021; 70(4):1141-1150.

<https://doi.org/10.3233/WOR-205029> [open access]

Abstract: Background: Work-related stress (WRS) presents a risk for sick leave. However, effective methods to identify people at risk for sick leave due to WRS at an early stage are

lacking in primary health care. Objective: To evaluate whether a systematic early identification of WRS can prevent sick leave over 24 months after the intervention. Methods: Study participants (n = 132 intervention; n = 139 control) were employed, non-sick-listed persons seeking care at primary health care centres. The intervention included early identification of WRS by a validated instrument, general practitioner (GP) awareness supported by a brief training session, patients' self-reflection by instrument completion, GP giving the patient feedback at consultation and GP identifying preventive measures. The control group received treatment as usual. Outcome data were retrieved from the Swedish Social Insurance Agency. Results: The intervention group had less registered median sick leave days (n = 56) than the control group (n = 65) but the difference was not statistically significant. Conclusions: The brief intervention was not proven effective in preventing sick leave in the following 24 months compared to treatment as usual. Further research on how to identify, advice and treat those at high risk for sick leave in primary health care is needed.

International Labour Organization. Diagnostic and exposure criteria for occupational diseases: guidance notes for diagnosis and prevention of the diseases in the ILO List of Occupational Diseases (revised 2010). Geneva, Switzerland: International Labour Office; 2022.

https://www.ilo.org/global/topics/safety-and-health-at-work/resources-library/publications/WCMS_836362/lang--en/index.htm

Leidi A, Berner A, Dumont R, Dubos R, Koegler F, Piumatti G, et al. Occupational risk of SARS-CoV-2 infection and reinfection during the second pandemic surge: a cohort study. Occupational & Environmental Medicine. 2022; 79(2):116-119.

<https://doi.org/10.1136/oemed-2021-107924>

Abstract: OBJECTIVES: This cohort study including essential workers, assessed the risk and incidence of SARS-CoV-2 infection during the second surge of COVID-19 according to baseline serostatus and occupational sector. METHODS: Essential workers were selected from a seroprevalence survey cohort in Geneva, Switzerland and were linked to a state centralised registry compiling SARS-CoV-2 infections. Primary outcome was the incidence of virologically confirmed infections from serological assessment (between May and September 2020) to 25 January 2021, according to baseline antibody status and stratified by three predefined occupational groups (occupations requiring sustained physical proximity, involving brief regular contact or others). RESULTS: 10 457 essential workers were included (occupations requiring sustained physical proximity accounted for 3057 individuals, those involving regular brief contact, 3645 and 3755 workers were classified under 'Other essential occupations'). After a follow-up period of over 27 weeks, 5 (0.6%) seropositive and 830 (8.5%) seronegative individuals had a positive SARS-CoV-2 test, with an incidence rate of 0.2 (95% CI 0.1 to 0.6) and 3.2 (95% CI 2.9 to 3.4) cases per person-week, respectively. Incidences were similar across occupational groups. Seropositive essential workers had a 93% reduction in the hazard (HR of 0.07, 95% CI 0.03 to 0.17) of having a positive test during the follow-up with no

significant between-occupational group difference. CONCLUSIONS: A 10-fold reduction in the hazard of being virologically tested positive was observed among anti-SARS-CoV-2 seropositive essential workers regardless of their sector of occupation, confirming the seroprotective effect of a previous SARS-CoV2 exposure at least 6 months after infection

MacGregor CS and Bearman C. The danger in the dark: safety and teamwork in Australian dark territory railway operations. *Safety Science*. 2022; 148:105638.

<https://doi.org/10.1016/j.ssci.2021.105638>

Nilsen M, Kongsvik T, and Almklov PG. Splintered structures and workers without a workplace: how should safety science address the fragmentation of organizations? *Safety Science*. 2022; 148:105644.

<https://doi.org/10.1016/j.ssci.2021.105644>

SantaBarbara N, Rezai R, Terry E, Shedd K, and Comulada WS. Preliminary efficacy and acceptability of an online exercise and nutrition workplace wellness program: a brief report. *Workplace Health & Safety*. 2022; 70(2):90-96.

<https://doi.org/10.1177/21650799211037528>

Abstract: BACKGROUND: Workplace wellness programs (WWP) offer physiological and psychological benefits to employees and financial and productivity benefits to employers. However, the COVID-19 pandemic has prevented in-person sessions and has required WWP's to transition to online platforms. The purpose of this brief report was to assess the preliminary feasibility, acceptability, and efficacy of a mobile version of the Bruin Health Improvement Program (BHIP mobile) WWP. METHODS: Participants virtually attended (i.e., via Zoom) twice weekly physical activity sessions and a once weekly nutrition seminar for 10-weeks with the option of a 30-minute one-on-one consultation with a registered dietician. Demographics, anthropometric indices, stress, muscular endurance, and aerobic fitness were assessed at baseline and follow-up. All analyses were conducted in SPSS v. 27. RESULTS: Twenty-seven participants (96% female) enrolled and 13 (100% female) completed the 10-week program. There were significant reductions in bodyweight ($p < .01$) and body mass index ($p < .02$) but not stress ($p > .05$), and significant increases in muscular endurance ($p < .01$) but not aerobic fitness ($p > .05$). Overall, BHIP mobile appears to be acceptable to participants but logistical concerns such as inconsistent internet connection was noted as potential downfalls. CONCLUSIONS/APPLICATIONS TO PRACTICE: Improvements in health outcome among completers of a mobile WWP were promising. Completer feedback highlighted program strengths as the flexibility and comfort of attending exercise sessions and nutrition classes from home. Future versions of the program will allocate resources to improve completion and expand appeal for men and women

Sepulveda ER and Brooker AS. Income inequality and COVID-19 mortality: age-stratified analysis of 22 OECD countries. *SSM - Population Health*. 2021; 16:100904.

<https://doi.org/10.1016/j.ssmph.2021.100904> [open access]

Abstract: Our study builds on a growing body of research that demonstrates an association between income inequality and COVID-19 mortality. Using Poisson multivariate regression, we age-stratify our analysis by separately examining each of four age groups over a nine-month study period in 22 OECD countries. Our full regression model controls for national median income and relative poverty, and a set of pandemic-specific variables to capture exposure, susceptibility and treatment. We found that country-level income inequality, as measured by the disposable income Gini coefficient, is significantly and positively associated with COVID-19 mortality for all four age groups. Consistent with previous studies that analyzed all-cause mortality by age, our regression results found that the point estimate of the Gini coefficient generally declines with age. Our results suggest that inequality is possibly acting through generic and pandemic-specific processes to increase mortality via a more pronounced negative COVID-19 socio-economic status gradient in higher inequality countries

Steenberg JL, Thielen K, Hansen JM, Hansen AM, Rueskov V, and Nabe-Nielsen K. Demand-specific work ability among employees with migraine or frequent headache. *International Journal of Industrial Ergonomics*. 2022; 87:103250.

<https://doi.org/10.1016/j.ergon.2021.103250> [open access]

Abstract: Headache disorders have serious implications for employees' work ability (WA). However, there is inadequate knowledge of what specific work-related activities that are affected by headache. We investigated demand-specific WA among individuals with migraine or frequent headache. We used cross-sectional questionnaire-data (n = 5,551) containing information about "migraine or frequent headache" and difficulties handling seven different job demands. In subgroup analyses (n = 4,028), we added information on medication. In ordinal logistic regression, we adjusted for sex, age, education, depressive symptoms and musculoskeletal pain. Individuals with previous or current migraine/headache had poorer WA, particularly with respect to the ability of handling physical and cognitive job demands. No use of medication as well as overuse of medication—both signalling suboptimal treatment—might aggravate the difficulties complying with job demands. Additionally, depressive symptoms and musculoskeletal pain seem to play a major role for the level of disability. Employees with headache disorders need adequate diagnosis and treatment. Rehabilitation should also address mental health as well as concurrent (musculoskeletal) pain conditions, which potentially benefit from non-medical interventions. Adjustment of the working conditions (physical and cognitive job demands) is likely to improve the work ability in this group of employees.

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