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

Alheresh R, Simpson E, Allaire S, and Keyser J. Workplace barriers among people with rheumatic and chronic back pain: results from the work experience survey for rheumatic conditions. *Work*. 2023; 75(3):869-875.

<https://doi.org/10.3233/WOR-211147>

Abstract: Background: The Work Experience Survey for Rheumatic Conditions (WES-RC) is a prominent feature of an evidence-based intervention to prevent premature job loss among people with arthritis. The WES-RC is used to identify client perceived barriers related to work performance. The degree to which people with arthritis and rheumatic conditions report barriers on the WES-RC has not been reported. Objective: The purpose of this study was to characterize the barriers reported on the WES-RC. Methods: Data from participants who completed the WES-RC in the "Work-It" study trial were included (N = 143). Descriptive statistics were used to characterize the sample and the frequency with which barriers on the WES-RC were reported. Responses to the top three bothersome barriers to study participants were summed. Results: The mean age of the sample was 50.3 years; 73% were female, and 66% white. All WES-RC items were checked as a barrier by at least two participants; less than 10 participants checked 34 items. Barriers in the 'getting ready for work and traveling to and from, or for work' domain, were frequently reported. The most bothersome barriers were 'standing or being on feet too long' and 'prolonged sitting'. Conclusion: The WES-RC is a self-reported checklist that captures a wide breadth of work-related barriers that could be experienced by people with arthritis who are currently employed.

Berge LAM, Liu FC, Grimsrud TK, Babigumira R, Stoer NC, Kjaerheim K, et al. Night shift work and risk of aggressive prostate cancer in the Norwegian Offshore Petroleum Workers (NOPW) cohort. *International Journal of Epidemiology*. 2023; 52(4):1003-1014.

<https://doi.org/10.1093/ije/dyac235> [open access]

Abstract: Background: Night shift work may acutely disrupt the circadian rhythm, with possible carcinogenic effects. Prostate cancer has few established risk factors though night shift work, a probable human carcinogen, may increase the risk. We aimed to study the association between night shift work and chlorinated degreasing agents (CDAs) as possible endocrine disruptors in relation to aggressive prostate cancer as verified malignancies. Methods: We conducted a case-cohort study on 299 aggressive prostate cancer cases and 2056 randomly drawn non-cases in the Norwegian Offshore Petroleum Workers cohort (1965-98) with linkage to the Cancer Registry of Norway (1953-2019). Work history was recorded as years with day, night, and rolover (rotating) shift work, and CDA exposure was assessed with expert-made job-exposure matrices. Weighted Cox regression was used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for aggressive prostate cancer, adjusted for education and year of first employment, stratified by 10-year birth cohorts, and with 10, 15, and 20 years of exposure lag periods. Results: Compared with day work only, an increased hazard of aggressive prostate cancer (HR = 1.86, 95% CI 1.18-2.91; P-trend = 0.046) was found in workers exposed to =19.5 years of rolover shift work. This persisted with longer lag periods (HR = 1.90, 95% CI 0.92-3.95; P-trend = 0.007). The exposure-hazard curve for a non-linear model increased linearly (HRs =1.00) for 18-26 years of rolover shift work. No association was found with CDA exposure. Conclusions: Long-term exposure to rolover shift work may increase the hazard of aggressive prostate cancer in offshore petroleum workers.

Ciftci B and Demirhan F. Investigating the impacts of working at home among office workers with neck pain on health status, depression and sleep quality during the COVID-19 pandemic. *International Journal of Occupational Safety & Ergonomics*. 2023; 29(3):970-978.

<https://doi.org/10.1080/10803548.2022.2090132>

Abstract: Objective. This study aimed to assess the effect of workplace and ergonomic features on neck pain intensity, sleep problems, depression and health status in office workers during the COVID-19 pandemic. Methods. One-hundred and thirty-nine office workers with neck pain aged 18-55 years were enrolled in the study. Sociodemographic features including ergonomic features of the workplace were evaluated. The Beck depression inventory (BDI), Nottingham health profile (NHP), Pittsburgh sleep quality index (PSQI) and neck pain and disability scale (NPDS) were administered to all participants. Results. All participants were grouped based on workplace into Group 1 (working in office, n = 84) and Group 2 (working at home, n = 55). There was a statistically significant difference between the groups according to the rate of absence of back support and flexible back (respectively p = 0.020 and p = 0.029). The neck pain and disability index (NPDI) scores of the participants who work with a computer for >3 h without a break was higher in Group 2 than in Group 1,

and the differences between groups were statistically significant ($p = 0.001$). Conclusions. The health-related quality of life was worse and neck pain intensity was severe in the working at home group than in the working in office group. Trial registration: ClinicalTrials.gov identifier: NCT05074407.

Codd Y, Coe A, Mullan RH, Kane D, and Stapleton T. 'You don't want to be seen as a burden' experiences of working with early inflammatory arthritis: a qualitative study. *Disability and Rehabilitation*. 2023; 45(17):2761-2769.

<https://doi.org/10.1080/09638288.2022.2107084>

Abstract: Purpose: To describe the impact of early inflammatory arthritis on work participation. Materials and methods: Thirty individuals (24 women) of working age (age 18-69 years) with inflammatory arthritis (<2 years duration) who were in paid employment or fulltime education were interviewed using qualitative description methodology. Data was analysed using thematic analysis. Results: Half of participants ($n = 15$) reported work disability within the first two-years of diagnosis. Five descriptive themes were identified that explained the early impact of IA on participation in paid employment. These themes were: (i) altered capacity for work; (ii) work comes first; (iii) the invisible burden; (iv) the disclosure effect; and (v) a reconstructed work future. Conclusion: The scale of early work disability appears to be higher than previously understood. Although early medical intervention has improved disease management, significant work-based restrictions requiring intervention remain. Internalised and invisible work-related anxieties present early in the disease and need to be acknowledged and addressed by healthcare providers. **IMPLICATIONS FOR REHABILITATION** Early inflammatory arthritis causes significant challenges in work ability, and early work-based participation restrictions are present despite early use of drug therapy. Assessment of the client's subjective experience, including understanding the invisible burden, is an important aspect in determining the types of work interventions required. Disclosure of diagnosis in the work environment is associated with anxiety and fear, however, disclosure is influential in supporting capacity to retain work participation and should be included in work interventions. Routine healthcare should include early interventions to address work-based restrictions and supporting work retention to avoid work disability.

Diaz-Silveira C, Santed-German MA, Burgos-Julian FA, Ruiz-Iniguez R, and Alcover CM. Differential efficacy of physical exercise and mindfulness during lunch breaks as internal work recovery strategies: a daily study. *European Journal of Work and Organizational Psychology*. 2023; 32(4):549-561.

<https://doi.org/10.1080/1359432X.2023.2198706>

Han ES. What did unions do for union workers during the COVID-19 pandemic? *British Journal of Industrial Relations*. 2023; 61(3):623-652.

<https://doi.org/10.1111/bjir.12716>

Herold R, Lieb M, Borho A, Voss A, Unverzagt S, Morawa E, et al. Relationship between working conditions and mental health of migrants and refugees/asylum seekers vs. natives in Europe: a systematic review. *International Archives of Occupational & Environmental Health*. 2023; 96(7):931-963.

<https://doi.org/10.1007/s00420-023-01981-w> [open access]

Abstract: OBJECTIVE: Migrants and refugees/asylum seekers make up a significant proportion of the European workforce. They often suffer from poor working conditions, which might impact mental health. The main objective of this systematic review was to summarize and analyze existing research on working conditions of migrants and refugees/asylum seekers in European host countries and compare them to those of natives. Furthermore, the relationship between working conditions and mental health of migrants/refugees/asylum seekers and natives will be compared. METHODS: Three electronic databases (PubMed/MEDLINE, PsycInfo and CINAHL) were systematically searched for eligible articles using quantitative study designs written in English, German, French, Italian, Polish, Spanish or Turkish and published from January 1, 2016 to October 27, 2022. Primary health outcomes were diagnosed psychiatric and psychological disorders, suicide (attempts), psychiatric and psychological symptoms, and perceived distress. Secondary health outcomes were more general concepts of mental health such as well-being, life satisfaction and quality of life. Screening, data extraction and the methodological quality assessment of primary studies by using the Newcastle-Ottawa Scale were done independently by two reviewers. The results of the primary studies were summarized descriptively. Migrants and refugees/asylum seekers were compared with natives in terms of the association between working conditions and mental health. RESULTS: Migrants and refugees often face disadvantages at work concerning organizational (low-skilled work, overqualification, fixed-term contracts, shift work, lower reward levels) and social conditions (discrimination experiences) in contrast to natives. Most unfavorable working conditions are associated with worse mental health for migrants as well as for natives. CONCLUSIONS: Even if the results are to be taken with caution, it is necessary to control and improve the working conditions of migrants and refugees/asylum seekers and adapt them to those of the native population to maintain their mental health and thus their labor force

King T, Maheen H, Taouk Y, and LaMontagne AD. Suicide in the Australian mining industry: assessment of rates among male workers using 19 years of coronial data. *Safety and Health at Work*. 2023; 14(2):193-200.

<https://doi.org/10.1016/j.shaw.2023.03.003> [open access]

Abstract: Background: International evidence shows that mining workers are at greater risk of suicide than other workers; however, it is not known whether this applies to the Australian

mining sector. Methods: Using data from the National Coronial Information System, rates of suicide among male mining workers were compared to those of three comparators: construction workers, mining and construction workers combined, and all other workers. Age-standardized suicide rates were calculated for 2001-2019 and across three intervals '2001-2006', '2007-2011', and '2012-2019'. Incidence rate ratios for suicide were calculated to compare incidence rates for mining workers, to those of the three comparative groups. Results: The suicide rate for male mining workers in Australia was estimated to be between 11 and 25 per 100,000 (likely closer to 25 per 100,000) over the period of 2001-2019. There was also evidence that the suicide rate among mining workers is increasing, and the suicide rate among mining workers for the period 2012-2019 was significantly higher than the other worker group. Conclusions: Based on available data, we tentatively deduce that suicide mortality among male mining workers is of concern. More information is needed on both industry and occupation of suicide decedents in order to better assess whether, and the extent to which, mining workers (and other industries and occupations) are at increased risk of suicide.

van de Langenberg D, Dolle MET, van Kerkhof LWM, Vermeulen RCH, and Vlaanderen JJ. Effects of nightshift work on blood metabolites in female nurses and paramedic staff: a cross-sectional study. *Annals of Work Exposures and Health*. 2023; 67(6):694-705.

<https://doi.org/10.1093/annweh/wxad018> [open access]

Abstract: Nightshift work disturbs the circadian rhythm, which might contribute to the development of cardio-metabolic disorders. In this cross-sectional study, we aimed to gain insight into perturbations of disease relevant metabolic pathways due to nightshift work. We characterized the metabolic profiles of 237 female nurses and paramedic staff participating in the Klokwerk study using the Nightingale Health platform. We performed analyses on plasma levels of 225 metabolites, including cholesterol, triglycerides, fatty acids, and amino acids. Using both principal component- and univariate-regression, we compared metabolic profiles of nightshift workers to metabolic profiles from workers that did not work night shifts (defined as day workers). We also assessed whether differential effects were observed between recently started versus more experienced workers. Within the group of nightshift workers, we compared metabolic profiles measured right after a nightshift with metabolic profiles measured on a day when no nightshift work was conducted. We observed evidence for an impact of nightshift work on the presence of unfavorable fatty acid profiles in blood. Amongst the fatty acids, effects were most prominent for PUFA/FA ratios (consistently decreased) and SFA/FA ratios (consistently elevated). This pattern of less favorable fatty acid profiles was also observed in samples collected directly after a night shift. Amino acid levels (histidine, glutamine, isoleucine, and leucine) and lipoproteins (especially HDL-cholesterol, VLDL-cholesterol, and triglycerides) were elevated when comparing nightshift workers with day workers. Amino acid levels were decreased in the samples that were collected directly after working a nightshift (compared to levels in samples that were collected during a non-nightshift period). The observed effects were generally more pronounced in samples

collected directly after the nightshift and among recently started compared to more experienced nightshift workers. Our finding of a suggested impact of shift work on impaired lipid metabolism is in line with evidence that links disruption of circadian rhythmicity to obesity and metabolic disorders

Makarevich A. Workplace gender segregation in standard and non-standard employment regimes in the US labour market. *British Journal of Industrial Relations*. 2023; 61(3):697-722.

<https://doi.org/10.1111/bjir.12730>

Pfortner TK and Demirer I. To what extent do job insecurity, income satisfaction, and self-rated health mediate the association between low income and presenteeism in Germany? A gendered analysis. *International Archives of Occupational & Environmental Health*. 2023; 96(7):999-1008.

<https://doi.org/10.1007/s00420-023-01982-9>

Abstract: Purpose: Low income is considered a possible determinant of presenteeism, explained by poor working and living conditions, increased levels of uncertainties and anxiety, and poor health status. We aimed to examine the association between low income and presenteeism by gender and to explain their association using different mediators. **Methods:** A total of 14,299 employees aged 18-65 from the 6th BIBB/BAuA Employment Survey 2012 were used, and mediation analyses with inverse odds weighting stratified by gender were conducted. **Results:** Low income was significantly associated with presenteeism for men at a significant level of $\alpha < .05$ (β : 0.376; 95%-CI 0.148-0.604) and for women at a significant level of $\alpha < .10$ (β : 0.120; 95%-CI - 0.015-0.255). The total effect (TE) was fully and significantly mediated for women when all mediator-weights were considered, whereas for men the consideration of single mediator-weights led to a full and significant mediation of the association between low income and presenteeism. Self-rated health status and income satisfaction contributed the most to the differences in presenteeism by low income with a proportion mediated of 96.3% (men) and 169.2% (women) for self-rated health and 101.6% (men) and 162.5% (women) for income satisfaction. **Discussion:** The results indicated a strong association between low income and presenteeism, in particular for men. Self-rated health and income satisfaction were the most important mediators of this association. The results underline not only the relevance of occupational health management and preventive measures, but also the need of a public debate about employment traditions, possibly resulting in role conflicts among men, and wage equality to prevent presenteeism of low-income earners.

Skovlund SV, Vinstrup J, Sundstrup E, and Andersen LL. Work-limiting musculoskeletal pain and its association with loss of paid employment among senior workers: prospective cohort study with register follow-up. *European Journal of Public Health*. 2023; 33(4):606-611.

<https://doi.org/10.1093/eurpub/ckad090> [open access]

Abstract: Background: A growing population of elderly necessitates a sharpened focus on sustainable employment through aging. Physically demanding work can be challenging, especially for senior workers. Establishing determinants of labor market participation could guide policy development and preventive efforts at the workplaces aiming at keeping senior workers longer in the labor market. Methods: We used data from SeniorWorkingLife, a comprehensive questionnaire survey among a representative sample of Danish +50-year workers, and investigated the prospective association between self-reported work limitations due to musculoskeletal pain ('work-limiting pain') in 2018 and register-based loss of paid employment before state pension age at 2-year follow-up among +50-year Danish workers with physically demanding work (n = 3050). Results: Results showed that work-limiting pain increased the risk of loss of paid employment before the state pension age in a progressive manner, i.e. the higher degree of work-limiting pain, the higher risk of loss of paid employment (P < 0.001). Experiencing a low degree of work-limiting pain was associated with an 18% increased risk of loss of paid employment [risk ratio (RR): 1.18, 95% confidence interval (CI): 1.14-1.21], whereas experiencing a very high degree of work-limiting pain increased the risk of loss of paid employment by 155% (RR: 2.55, 95% CI: 2.43-2.69) compared to no work-limiting pain. Conclusion: In conclusion, work-limiting pain constitutes an important risk factor for loss of paid employment among senior workers with physically demanding work, and effective preventive efforts at both policy and workplace levels should be documented and implemented.

Thonon F, Godon-Rensonnet AS, Perozziello A, Garsi JP, Dab W, and Emsalem P. Return on investment of workplace-based prevention interventions: a systematic review. *European Journal of Public Health*. 2023; 33(4):612-618.

<https://doi.org/10.1093/eurpub/ckad092> [open access]

Abstract: Background: Occupational Safety and Health is an important public health topic. Many employers may regard health promotion or prevention initiatives as an additional cost with few benefits. The aim of this systematic review is to identify the studies conducted on the return on investment (ROI) of preventive health interventions conducted within workplaces, and to describe their designs, topics and calculation methods. Methods: We searched PubMed, Web of Science, Science Direct, National Institute for Occupational Safety and Health, International Labour Organization and Occupational Safety and Health Administration from 2013 to 2021. We included studies that evaluated prevention interventions in the workplace setting and reported an economic outcome or company-related benefits. We report the findings according to PRISMA reporting guidelines. Results: We included 141 articles reporting 138 interventions. Of them, 62 (44.9%) had an experimental design, 29 (21.0%) had a quasi-experimental design, 37 (26.8%) were

observational studies and 10 (7.2%) were modelling studies. The interventions' objectives were mostly related to psychosocial risks (N = 42; 30.4%), absenteeism (N = 40; 29.0%), general health (N = 35; 25.4%), specific diseases (N = 31; 22.5%), nutrition (N = 24; 17.4%), sedentarism (N = 21; 15.2%) musculoskeletal disorders (N = 17; 12.3%) and accidents (N = 14; 10.1%). The ROI calculation was positive for 78 interventions (56.5%), negative for 12 (8.7%), neutral for 13 (9.4%) and undetermined for 35 (25.4%). Conclusion: There were many different ROI calculations. Most studies have a positive result but randomized controlled trials have fewer positive results than other designs. It is important to conduct more high-quality studies so that results can inform employers and policy-makers.

Tjosvoll SO, Steiro Fimland M, Gonzalez V, Seeberg TM, Holtermann A, Faerevik H, et al. Physical work demands of maintenance workers on onshore petroleum facilities in Norway: an observational study utilizing wearable sensor technology. *Annals of Work Exposures and Health*. 2023; 67(6):706-719.

<https://doi.org/10.1093/annweh/wxad022> [open access]

Abstract: Objectives: High physical work demands can cause musculoskeletal disorders and sick leave in petroleum workers. However, our knowledge of their physical work demands is scarce and based on self-report. The objective of our study is to work towards closing this knowledge gap by assessing the physical work demands of onshore petroleum maintenance workers using body-worn sensors. Methods: A total of 46 of 69 eligible maintenance workers (37 mechanics and 9 process technicians) from three onshore petroleum facilities in Norway filled in a questionnaire and diary and wore five accelerometers and a heart rate sensor for up to six consecutive workdays. Work-related physical activity and postures were classified using rule-based modelling in a modified version of the validated Acti4 software. Results: The onshore maintenance petroleum workers were working an average of 10 h a day and spent on average this time with 48% (SD = 16.5) sitting, 1% (SD = 2.8) lying down, 39% (SD = 16.2) in light physical activity, and 9% (SD = 3.8) in moderate to vigorous physical activity. During work hours while at feet, we found arm elevation =60° to be 11% (SD = 7.1) (68 min), and forward bending of the trunk =60° to be 2% (SD = 2.2) (14 min). The workers spent 2% (SD = 2.5) (12 min) of the workhours kneeling. We observed a high inter-individual variation for all these work exposures. Moreover, 26% (12) of the workers conducted static standing for >30% of the workday, and 17% (8) spent more than half of the work hours >33% of their estimated maximal cardiovascular capacity. Conclusions: While onshore maintenance petroleum workers on average spend about half of the workday sitting or lying down, the remaining worktime is spent with a rather high duration of arm elevation and forward bending. Quite high fraction of the workers spends much of the workhours in static standing and kneeling. We see a substantial variation in these work exposures between the workers. The findings indicate a need for preventive measures in how work is organized and performed.

Torka AK, Mazei J, Bosco FA, Cortina JM, Gotz M, Kepes S, et al. How well are open science practices implemented in industrial and organizational psychology and management? European Journal of Work and Organizational Psychology. 2023; 32(4):461-475.

<https://doi.org/10.1080/1359432X.2023.2206571>

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