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

***Chapman LS, Redmond AC, Flurey CA, Richards P, Smith TO, Arnold JB, Beaton D, et al. Developing an Outcome Measures in Rheumatology (OMERACT) Core set of Outcome Measures for FOot and ankle disorders in RheumaTic and musculoskeletal diseases (COMFORT): core domain set study protocol. *Trials*. 2023; 24(1):65.**

<https://doi.org/10.1186/s13063-023-07104-7> [open access]

Abstract: BACKGROUND: Foot and ankle involvement is common in rheumatic and musculoskeletal diseases (RMDs). High-quality evidence is lacking to determine the effectiveness of treatments for these disorders. Heterogeneity in the outcomes used across clinical trials and observational studies hinders the ability to compare findings, and some outcomes are not always meaningful to patients and end-users. The Core set of Outcome Measures for FOot and ankle disorders in RheumaTic and musculoskeletal diseases (COMFORT) study aims to develop a core outcome set (COS) for use in all trials of interventions for foot and ankle disorders in RMDs. This protocol addresses core outcome domains (what to measure) only. Future work will focus on core outcome measurement instruments (how to measure). METHODS: COMFORT: Core Domain Set is a mixed-methods study involving the following: (i) identification of important outcome domains through literature reviews, qualitative interviews and focus groups with patients and (ii) prioritisation of domains through an online, modified Delphi consensus study and subsequent consensus meeting with representation from all stakeholder groups. Findings will be disseminated widely to enhance uptake. CONCLUSIONS: This protocol details the development process and methodology to identify and prioritise domains for a COS in the novel area of foot and ankle

disorders in RMDs. Future use of this standardised set of outcome domains, developed with all key stakeholders, will help address issues with outcome variability. This will facilitate comparing and combining study findings, thus improving the evidence base for treatments of these conditions. Future work will identify suitable outcome measurement instruments for each of the core domains. TRIAL REGISTRATION: This study is registered with the Core Outcome Measures in Effectiveness Trials (COMET) database, as of June 2022: <https://www.comet-initiative.org/Studies/Details/2081>

***Khoo T, Jones B, Chin A, Terrett A, Voshaar M, Hoogland W, March L, Beaton D, et al. Defining independence: a scoping review by the OMERACT patient perspective of remission in rheumatoid arthritis group. *Seminars in Arthritis and Rheumatism*. 2023; 58:152152. <https://doi.org/10.1016/j.semarthrit.2022.152152>**

Abstract: AIMS: The Outcome Measures in Rheumatology Trials (OMERACT) Remission in Rheumatoid Arthritis (RA) patient perspective working group has previously found that patients prioritised independence, pain, and fatigue as key domains of remission in RA. However, there is currently no clear definition of independence. Consequently, this scoping review aimed to explore how independence is represented in the RA literature. METHODS: A comprehensive search of the EMBASE, Medline, and PsycInfo databases was performed for publications that used independence or autonomy as a disease activity measure, description of disease in remission or treatment outcome. Papers were included if they involved adult participants and were written in English, with no restrictions on study design or publication year. Two reviewers (TK and AC, AT or BJ) independently screened the abstracts. A thematic approach was applied to derive common definitions and descriptions of independence. RESULTS: 660 articles were identified, of which 58 (25 qualitative, 28 quantitative, one mixed, and four reviews) met the inclusion criteria. 86% of total participants were female. Ten publications referenced remission. Independence took many forms; in addition to physical and functional capability, it was described in relation to work, social activities, autonomy in healthcare, and household activities. Four common themes describing independence were identified: 1. A return to a state before arthritis. 2. Being physically and functionally able. 3. A sense of freedom without needing to rely on others. 4. Having control over the organisation of one's life. CONCLUSION: Although independence is frequently mentioned in the RA literature, it has various meanings, lacks a consistent definition, and is a concept rarely applied to remission. It is multi-factorial, exceeding functional ability alone, and contextualised within sociodemographic and disease factors. This scoping review provides common descriptions of independence to inform future qualitative work towards the development of an outcome measure of independence for the assessment of RA in remission

Balogh R, Gadeyne S, Jonsson J, Sarkar S, Van Aerden K, Warhurst C, et al. Employment trajectories and mental health-related disability in Belgium. *International Archives of Occupational & Environmental Health*. 2023; 96(2):285-302. <https://doi.org/10.1007/s00420-022-01923-y> [open access]

Abstract: Objectives: An individual's quality of employment over time has been highlighted as a potential determinant of mental health. With mental ill-health greatly contributing to work incapacities and disabilities in Belgium, the present study aims to explore whether mental health, as indicated by registered mental health-related disability, is structured along the lines of employment quality, whereby employment quality is assessed over time as part of individuals' labour market trajectories. Methods: Using administrative data from the Belgian Crossroads Bank for Social Security over 16 quarters between 2006 and 2009, transitions between waged jobs of varying quality (based on dimensions of income, working time, employment stability and multiple jobholding), self-employment, and unemployment are considered among individuals in the labour force aged 30-40 at baseline (n = 41,065 women and 45,667 men). With Multichannel Sequence Analysis and clustering, we constructed ideal types of employment trajectories. Fitting Cox regressions, we then evaluated individuals' hazard of experiencing a disability from a mental disorder between 2010 and 2016. Results: Our analysis highlights various gender-specific trajectories. Among both genders, individuals exposed to near-constant unemployment over the initial 4 years showed the highest hazard of subsequent mental health-related disability compared to a group characterised by stable full-time employment, single jobholding, and above-median income. Trajectories involving a higher probability of subsidised and non-standard employment and (potential) spells of unemployment and lower relative income were also strong predictors of cause-specific disabilities. Health selection and confounding might, however, be contributing factors. Conclusions: Our study shows a gradient of mental disorders resulting in a disability along trajectory types. Our findings highlight the predictive power of labour market trajectories and their employment quality for subsequent mental disorder-related disability. Future research should examine the mechanisms, including selection effects in this association.

Chappel SE, Naweed A, Chapman J, Vandelanotte C, Holtermann A, and Straker L. Can occupational health professionals successfully apply the Goldilocks Work Paradigm in a simulated work redesign? *Ergonomics*. 2023; 66(2):153-166.

<https://doi.org/10.1080/00140139.2022.2067357>

Abstract: This study aimed to assess occupational health professionals' application of the Goldilocks Work Paradigm in redesigning jobs for healthier physical behaviours while maintaining productivity. During a group simulation exercise, participants (n = 16) created job descriptions for four different occupation cases (factory worker, office worker, teacher, train driver) and then redesigned the jobs using the Paradigm. Substantial changes in the time spent in sitting (9-30%), standing (8-42%), walking (6-14%), and high-intensity (0-24%) physical behaviours were achieved, which if implemented would likely result in enhanced health for workers. Overall, occupational health professionals were able to successfully redesign fictitious jobs aligned with the Goldilocks Work Paradigm. The simulation task used in this study may be useful to train professionals and assist workplaces to understand and implement the Goldilocks Work Paradigm into practice. Practitioner summary: This study assessed whether occupational health professionals could be trained in the Goldilocks Work

Paradigm through a job redesign simulation task. Participants were able to redesign jobs to achieve a healthier 'just right' balance of physical behaviours. Simulations may help workplaces understand and implement a Goldilocks Work approach into practice.

Cho S, Park WJ, Ahn JS, Lim DY, Kim SH, and Moon JD. Obstructive sleep apnea risk and hearing impairment among occupational noise-exposed male workers. Archives of Environmental & Occupational Health. 2023; 78(2):108-117.

<https://doi.org/10.1080/19338244.2022.2094306>

Abstract: This study aimed to investigate the association between obstructive sleep apnea (OSA) risk and hearing impairment among workers exposed to occupational noise. A cross-sectional study was conducted among 607 healthy male workers at a tire-manufacturing factory. The subjects underwent audiometric testing, and their OSA risk was examined based on the STOP-Bang questionnaire. Hearing impairment was defined as a hearing threshold >25 dB hearing level (HL) in any frequency of 1, 2, 3 and 4 kHz in either ear. High OSA risk was defined as a STOP-bang score of =3. Hearing thresholds at 1, 2, 3 and 4 kHz in both ears were significantly higher among workers with high OSA risk than among those with low OSA risk after adjusting for confounders. Multiple logistic regression analysis examining the association of OSA risk and STOP-Bang score with hearing impairment revealed an odds ratio of 1.738 (95% confidence interval [CI] 1.113-2.713, $p = 0.015$) and 1.256 (95% CI 1.031-1.529, $p = 0.023$), respectively, after adjusting for confounders. In addition, when the hearing impairment was reclassified into high- and low-frequency hearing impairment, a statistically significant OR was seen for high-frequency hearing impairment. In conclusion, high OSA risk was associated with hearing impairment in occupational noise-exposed workers, especially in the high-frequency range of 3 and 4 kHz. More efforts are required to improve the management of OSA and its risk factors to preserve hearing in occupational noise-exposed workers.

Hopwood P, MacEachen E, Majowicz SE, Meyer SB, and Amoako J. "We need to talk to each other": crossing traditional boundaries between public health and occupational health to address COVID-19. Frontiers in Public Health. 2022; 10:1046628.

<https://doi.org/10.3389/fpubh.2022.1046628> [open access]

Abstract: INTRODUCTION: This study examined how public health (PH) and occupational health (OH) sectors worked together and separately, in four different Canadian provinces to address COVID-19 as it affected at-risk workers. In-depth interviews were conducted with 18 OH and PH experts between June to December 2021. Responses about how PH and OH worked across disciplines to protect workers were analyzed. METHODS: We conducted a qualitative analysis to identify Strengths, Weakness, Opportunities and Threats (SWOT) in multisectoral collaboration, and implications for prevention approaches. RESULTS: We found strengths in the new ways the PH and OH worked together in several instances; and identified weaknesses in the boundaries that constrain PH and OH sectors and relate to communication with the public. Threats to worker protections were revealed in policy gaps.

Opportunities existed to enhance multisectoral PH and OH collaboration and the response to the risk of COVID-19 and potentially other infectious diseases to better protect the health of workers. **DISCUSSION:** Multisectoral collaboration and mutual learning may offer ways to overcome challenges that threaten and constrain cooperation between PH and OH. A more synchronized approach to addressing workers' occupational determinants of health could better protect workers and the public from infectious diseases

Kahan BC, Li F, Copas AJ, and Harhay MO. Estimands in cluster-randomized trials: choosing analyses that answer the right question. *International Journal of Epidemiology*. 2023; 52(1):107-118.

<https://doi.org/10.1093/ije/dyac131> [open access]

Abstract: **BACKGROUND:** Cluster-randomized trials (CRTs) involve randomizing groups of individuals (e.g. hospitals, schools or villages) to different interventions. Various approaches exist for analysing CRTs but there has been little discussion around the treatment effects (estimands) targeted by each. **METHODS:** We describe the different estimands that can be addressed through CRTs and demonstrate how choices between different analytic approaches can impact the interpretation of results by fundamentally changing the question being asked, or, equivalently, the target estimand. **RESULTS:** CRTs can address either the participant-average treatment effect (the average treatment effect across participants) or the cluster-average treatment effect (the average treatment effect across clusters). These two estimands can differ when participant outcomes or the treatment effect depends on the cluster size (referred to as 'informative cluster size'), which can occur for reasons such as differences in staffing levels or types of participants between small and large clusters. Furthermore, common estimators, such as mixed-effects models or generalized estimating equations with an exchangeable working correlation structure, can produce biased estimates for both the participant-average and cluster-average treatment effects when cluster size is informative. We describe alternative estimators (independence estimating equations and cluster-level analyses) that are unbiased for CRTs even when informative cluster size is present. **CONCLUSION:** We conclude that careful specification of the estimand at the outset can ensure that the study question being addressed is clear and relevant, and, in turn, that the selected estimator provides an unbiased estimate of the desired quantity

Liu R, Liu H, Shi H, and Gu X. Occupational health and safety risk assessment: a systematic literature review of models, methods, and applications. *Safety Science*. 2023; 160:106050.
<https://doi.org/10.1016/j.ssci.2022.106050>

Medin-Ceylan C, Korkmaz MD, Sahbaz T, and Cigdem Karacay B. Risk factors of neck disability in computer-using office workers: a cross-sectional study. *International Journal of Occupational Safety & Ergonomics*. 2023; 29(1):44-49.

<https://doi.org/10.1080/10803548.2021.2021712>

Abstract: ClinicalTrials.gov identifier: NCT04821024

Niedhammer I, Pineau E, and Bertrais S. Study of the variation of the 12-month prevalence of exposure to workplace bullying across national French working population subgroups. International Archives of Occupational & Environmental Health. 2023; 96(2):213-224.

<https://doi.org/10.1007/s00420-022-01916-x> [open access]

Abstract: OBJECTIVES: The studies are lacking on the variation of the prevalence of exposure to workplace bullying according to subgroups of national working populations. The objectives were to assess the 12-month prevalence of bullying in the national French working population, to describe the reported reasons for bullying, and to study its variation according to various employment variables. METHODS: The study was based on the data of the 2013 national French working conditions survey. The study sample included 25,769 employees aged 15-65 working in the same job within the last 12 months. The 12-month prevalence of bullying was assessed using a 9-item questionnaire. Employment variables included: occupation, economic activity of the company, public/private sector, company size, permanent/temporary work contract, and full/part-time work. The analyses were performed using statistical methods for weighted survey data. RESULTS: The 12-month prevalence of bullying was 26.7% and 28.7% for men and women, respectively. The most prevalent forms of bullying were criticisms, exclusion, and deprivation of right of expression. The leading reasons for being bullied were related to occupation, age, and gender. The prevalence of bullying was higher among the younger employees, the employees working in medium/large companies (including the public sector), and among employees working full time. Though significant, the variations according to occupations and economic activities of the company were small. CONCLUSION: Workplace bullying appeared as a widespread phenomenon in France. More attention should be given to young employees and the employees working in medium/large companies. Preventive measures should also target the whole working population comprehensively

Peters SE, Gundersen DA, Katz JN, Sorensen G, and Wagner GR. Thriving from Work Questionnaire: dimensionality, reliability, and validity of the long and short form questionnaires. American Journal of Industrial Medicine. 2023; [epub ahead of print].

<https://doi.org/10.1002/ajim.23465>

Abstract: Introduction: Thriving from Work is defined as the state of positive mental, physical, and social functioning in which workers' experiences of their work and working conditions enable them to thrive in their overall lives, contributing to their ability to achieve their full potential at work, at home, and in the community. The purpose of this study was to develop a psychometrically-sound questionnaire measuring the positive contribution that work can have on one's well-being both at, and outside of, their work. Methods: We used both a qualitative and quantitative approach of item reduction, domain mapping dimensionality testing, development of "long-" and "short-" versions of the questionnaire, reliability, and

construct and criterion validity testing. This was established in two independent online samples of US based workers (n = 1550, n = 500). Results: We developed a bi-factor model 30-item long-form and a uni-factorial 8-item short-version. The long-form measures both the latent construct of Thriving from Work and six domains (psychological/emotional; work-life integration; social; experience of work; basic needs; health). Both long- and short- forms were found to have high empirical reliability (0.93 and 0.87 respectively). The short-form captures 94% of variance of the long-form. Construct and criterion validity were supported. Test-retest reliability was high. Conclusions: The Thriving from Work Questionnaire appears to be a valid and reliable measure of work-related well-being in United States workers. Further testing is needed to refine and test the instrument in specific industries, unique worker populations, and across geographic regions.

Rafindadi AD, Shafiq N, Othman I, Ibrahim A, Aliyu MM, Mikic M, et al. Data mining of the essential causes of different types of fatal construction accidents. *Heliyon*. 2023; 9(2):e13389.

<https://doi.org/10.1016/j.heliyon.2023.e13389> [open access]

Abstract: Accident analysis is used to discover the causes of workplace injuries and devise methods for preventing them in the future. There has been little discussion in the previous studies of the specific elements contributing to deadly construction accidents. In contrast to previous studies, this study focuses on the causes of fatal construction accidents based on management factors, unsafe site conditions, and workers' unsafe actions. The association rule mining technique identifies the hidden patterns or knowledge between the root causes of fatal construction accidents, and one hundred meaningful association rules were extracted from the two hundred and fifty-three rules generated. It was discovered that many fatal construction accidents were caused by management factors, unsafe site circumstances, and risky worker behaviors. These analyses can be used to demonstrate plausible cause-and-effect correlations, assisting in building a safer working environment in the construction sector. The study findings can be used more efficiently to design effective inspection procedures and occupational safety initiatives. Finally, the proposed method should be tested in a broader range of construction situations and scenarios to ensure that it is as accurate as possible

Smith A and McBride J. 'It was doing my head in': low-paid multiple employment and zero hours work. *British Journal of Industrial Relations*. 2023; 61(1):3-23.

<https://doi.org/10.1111/bjir.12689> [open access]

Abstract: This article explores the lived experiences and working time complexities of low-paid workers in legitimate multiple employment and zero hours work. Based on detailed qualitative research, these workers have 2, 3, 4, 5 and even 7 different jobs out of necessity due to low-pay, unpredictable working hours and employment precarity. The research reveals that workers need to be available for (potential) work at any point but may not actually be offered any hours, which we argue constitutes unremunerated labour time. The

findings highlight a densification of working time with zero hours work as employers maximize productive effort into specifically numbered, demarcated and minimized working hours, which tightens the porosity of labour. There is a dual fragmentation and individualization of employment, as these workers traverse multiple, expansive, complex and dynamic temporalities of work. This study identifies new economic and temporal indeterminacies of labour, which fundamentally transform the employment relationship and wage-effort bargain.

de Troya Marin M, Aguilar S, Aguilera-Arjona J, Rivas-Ruiz F, Rodriguez-Martinez A, de Castro-Maqueda G, et al. Risk assessment of occupational skin cancer among outdoor workers in southern Spain: local pilot study. Occupational and Environmental Medicine. 2023; 80(1):14-20.

<https://doi.org/10.1136/oemed-2022-108454>

Abstract: OBJECTIVE: Overexposure to ultraviolet (UV) radiation is the main preventable cause of skin cancer. Outdoor workers, exposed to the sun for many hours throughout their working lives, are at special risk. The aim of this study is to determine occupational photoexposure and photoprotection among outdoor workers employed by a municipality in southern Spain. METHODS: Cross-sectional descriptive study focusing on outdoor workers employed by the municipality of Fuengirola (in areas such as construction, gardening, urban cleaning and beach maintenance). The participants were monitored by personal dosimetry, participated in a dermatological check-up and answered a validated questionnaire (CHACES) on their habits, attitudes and knowledge related to sun exposure. RESULTS: The median effective erythema dose of exposure to solar UV radiation during the working day (n=20) was 379.4 J/m², equivalent to 3.8 standard erythema doses, almost 3 times higher than the recommended limits for an 8-hour workday. Skin examination (n=128) revealed the presence of actinic lentigines (79.7%), actinic keratoses (8.6%) and skin cancer (3.9%). The CHACES questionnaire (n=128) revealed a sunburn rate of 50.0%. Photoprotection practices were markedly deficient: only 16.7% of the survey respondents sought protection in the shade, 20.3% avoided exposure during the peak exposure hours and 33.1% applied sunscreen. CONCLUSIONS: This is the first study to evaluate UV radiation exposure, occupational sun protection practices, sunburn and actinic injuries of different outdoor workers in one of the sunniest regions of Spain and underlines the need for effective interventions to protect outdoor workers' health

White EM, Travers JL, Gouskova N, Oh G, Syme M, Yang X, et al. Differences in nursing home staff COVID-19 testing rates and odds of vaccination across work shifts. Health Affairs. 2023; 42(2):217-226.

<https://doi.org/10.1377/hlthaff.2022.01011>

Abstract: COVID-19 vaccination and regular testing of nursing home staff have been critical interventions for mitigating COVID-19 outbreaks in US nursing homes. Although implementation of testing has largely been left to nursing home organizations to coordinate,

vaccination occurred through a combination of state, federal, and organization efforts. Little research has focused on structural variation in these processes. We examined whether one structural factor, the primary shift worked by staff, was associated with differences in COVID-19 testing rates and odds of vaccination, using staff-level data from a multistate sample of 294 nursing homes. In facility fixed effects analyses, we found that night-shift staff had the lowest testing rates and lowest odds of vaccination, whereas day-shift staff had the highest testing rates and odds of vaccination. These findings highlight the need to coordinate resources and communication evenly across shifts when implementing large-scale processes in nursing homes and other organizations with shift-based workforces

Xiong J, Wen JL, Pei GS, Han X, and He DQ. Effectiveness of Internet-based cognitive behavioural therapy for employees with depression: a systematic review and meta-analysis. *International Journal of Occupational Safety & Ergonomics*. 2023; 29(1):268-281. <https://doi.org/10.1080/10803548.2022.2043647>

Abstract: Objectives. The effectiveness of Internet interventions for employees with depressive disorder remains controversial. We summarized all available evidence exploring the role of Internet interventions in reducing employees' depressive symptoms. Methods. This study was a comprehensive systematic review and meta-analysis that included acceptability and preliminary feasibility studies. We excluded programme descriptions, discussion articles and study protocols. We followed the PRISMA guidelines and searched MEDLINE, EMBASE, PsycINFO, the Cochrane Library and Web of Science from database inception to May 2021 for articles published in English. We extracted data concerning demographics, intervention format, including Internet interventions, control group conditions and outcome measures. We used a random-effects model and calculated Hedges' g values for the scores of employees receiving Internet interventions versus control conditions. This systematic review is registered as INPLASY202160082. Results. Data from 19 studies were included. These 19 studies included 5898 participants (2813 participants received Internet interventions, 3085 participants were in control groups). Conclusions. The findings suggest that Internet interventions can be effective in improving depression in employees. However, more randomized controlled trials are needed to provide better evidence regarding Internet interventions for employees with depression, and robust studies are needed to observe the effectiveness of Internet interventions

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