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

***Nowrouzi-Kia B, Carlin L, Furlan AD, Harbin S, Severin CN, Irvin E, Carnide N. Project ECHO Occupational and Environmental Medicine: a qualitative study of healthcare providers supporting workers with work-related injuries and illnesses. *Journal of Occupational Rehabilitation*. 2025; [epub ahead of print].**

<https://doi.org/10.1007/s10926-024-10266-z> [open access]

Abstract: PURPOSE: This qualitative study investigated the needs, barriers, and facilitators that affect primary care providers' involvement in supporting patients' stay-at-work and return-to-work following injury or illness. It also aims to understand the lived experiences of primary care providers who participated in the Extension for Community Healthcare Outcomes training program for Occupational and Environmental Medicine (ECHO OEM). By examining both the structural and experiential aspects of the program, this study seeks to provide insights into how ECHO OEM influences providers' approaches to occupational health challenges. METHODS: Those who attended ECHO OEM sessions were invited to participate in the research study. Four focus groups and five one-on-one interviews were conducted with healthcare providers participating in ECHO OEM. Audio-recordings were transcribed verbatim and analyzed using an inductive thematic analysis approach. This study was structured according to the COREQ Checklist. RESULTS: We discussed six main themes: (1) Challenges with Engaging with Workers' Compensation Boards; (2) Return to Work practices; (3) Health and Well-Being; (4) Communication is Important; (5) Perspective from the Workplace; and (6) Feedback on ECHO OEM. CONCLUSION: ECHO OEM sessions contribute to and impact healthcare providers' knowledge of supporting injured or ill workers. Topics that deserve further attention include incorporating comorbid physical and mental health conditions, navigating workers' compensation systems, and supporting specific populations such as military veterans and emergency personnel

Aarhus L, Skare O, Nordby KC, Gulsvik A, Vikjord S, Hedman L, et al. Occupation and 11-year lung function decline in the HUNT Study. *Occupational Medicine*. 2025; 74(9):676-683.

<https://doi.org/10.1093/occmed/kqae115> [open access]

Abstract: Background: The association between occupational titles and lung function has mostly been examined through cross-sectional studies. Preventive measures are expected to mitigate adverse effects; hence, updated estimates are necessary. Aims: To study change in lung function measured by spirometry across occupations. Methods: This population-based prospective cohort study comprised 5618 working adult participants of the Trøndelag Health Study (HUNT3, 2005-07), Norway. Among these, 3800 individuals (43% men, mean age 42 years, range 20-55) also attended HUNT4 (2017-19). We analysed longitudinal decline in forced expiratory volume in 1 second (FEV1) z-score during the 11-year follow-up by occupation (white-collar workers as reference category), in mixed models, adjusting for age, sex and smoking. We assessed the prevalence of self-reported respiratory symptoms and disease in the working population in HUNT4 (n = 32 124) and HUNT3 (n = 32 070). Results: Compared with white-collar workers, agricultural workers and 'drivers and mobile plant operators', had larger declines in FEV1z-score during follow-up. In sex-stratified analyses, men defined as agricultural workers and 'drivers and mobile plant operators' had larger declines than white-collar workers. Among women, who were underrepresented in many blue-collar jobs, workers classified as 'machine operators and assemblers' experienced greater declines. In the working population in HUNT4, the prevalence of respiratory symptoms in connection with work was 8%, and lower among white-collar workers (6%) than blue-collar workers (14%). Conclusions: Although certain workers in Norway remain at risk for occupational lung function decline, there were modest differences between occupations. The findings encourage continuous efforts to implement preventive measures in high-risk jobs.

Balogh R, Gadeyne S, Vanroelen C, and Warhurst C. Multidimensional employment trajectories and dynamic links with mental health: evidence from the UK Household Longitudinal Study. *Scandinavian Journal of Work, Environment & Health*. 2025; 51(1):26-37.

<https://doi.org/10.5271/sjweh.4193> [open access]

Abstract: OBJECTIVES: Low-quality and precarious employment have been associated with adverse mental health and wellbeing. More evidence is needed on how the quality of employment trajectories - including transitions in and out of unemployment, inactivity, and employment of varying quality - are associated with individuals' mental health over time. This paper aimed to derive a typology of multidimensional employment trajectories and assess associations with mental health in the UK. METHODS: Data from waves 1-9 of the UK Household Longitudinal Study were used (2009-2019). Individuals aged 30-40 at baseline were included (N=1603). Using multichannel sequence and clustering analyses, we derived a typology of employment trajectories across employment statuses and four employment quality indicators. We assessed associations with subsequent psychological distress, accounting for baseline mental health. Changes in average General Health Questionnaire scores are described. RESULTS: A typology of five trajectory clusters highlighted stable and secure and precarious/low-quality trajectories for both men and women. Women who reported being economically inactive at most waves had higher odds of experiencing psychological distress than did women in 'standard' trajectories, regardless of baseline mental health. Women's scores of psychological distress in the 'precarious' group on average increased along their trajectories characterized by instability and transitions in/out of unemployment, before a move into employment. Men who likely moved in and out of unemployment and economic inactivity, with low probability of paid employment, reported increased

psychological distress at the end of follow-up. This may partly be due to pre-existing mental ill-health.

CONCLUSION: This paper shows the importance of high-quality employment for individuals' mental health over time. Researchers need to consider dynamic associations between employment quality and mental health across the life-course

Gagnon G, Sekkay F, Imbeau D, and Bourgault M. Analyzing occupational accidents and exoskeleton potential in the construction industry in Québec, Canada. IJSE Transactions on Occupational Ergonomics and Human Factors. 2024; 12(4):246-264.

<https://doi.org/10.1080/24725838.2024.2432450>

Abstract: Occupational applications: Our analysis of construction firm accident data in Québec, Canada, spanning from January 2019 to June 2022, provides critical insights for ergonomics and human factors practitioners. The predominant accidents involved being struck by objects (31%) and falls (15%), with lacerations and bruises comprising 37% of injuries. Notably, carpenters had the highest accident rate (22%), prompting attention to task-specific safety measures. We also examined musculoskeletal injuries (MSI), finding that bodily reactions (46%) and overexertion (44%) were primary causes. Importantly, we qualitatively explored the potential of exoskeletons as possible proactive safety measures; our results suggested that in 50% of MSI cases, exoskeletons might have helped to mitigate or eliminate risks. These findings underscore the potential for exoskeletons to enhance safety and productivity in the construction industry, offering opportunities for intervention and preventive measures in ergonomics practice. **Technical abstract:** Background: The construction industry is a hazardous working environment, having a relatively high risk of accidents and injuries compared to other industries. Purpose: We aimed to describe the characteristics of work accidents in a large construction firm in Québec, Canada, using accident data from the Health, Safety, and Environment Department. Methods: Our dataset spanned from January 2019 to June 2022 and included 2065 complete entries for analysis. Accidents were categorized using a standardized classification scheme, augmented with additional accident types to provide more precision. Results: The most common type of accident was being struck by an object, comprising 31% of reported incidents, followed by falls at 15%. Lacerations and bruises were the most prevalent injuries, accounting for 37% of cases, with injuries to the hand (31%) and the head/eye (24%) being the most frequent. Among the trades analyzed, carpenters had the highest accident rate at 22%, closely followed by laborers at 20%. We also focused on occupational musculoskeletal injuries (MSI) in the dataset to qualitatively investigate the viability of exoskeletons as a proactive safety measure. Of the 268 incidents categorized as MSI-related (13% of the 2065 events), bodily reactions (46%) and overexertion (44%) were the leading causes. A detailed qualitative analysis of the event descriptions suggested that if exoskeletons had been made available and used, they could have contributed to reducing or eliminating MSI risk in 50% of cases. Conclusions: These results contribute to enhancing safety and productivity in the construction industry by providing insights into work accidents and task characteristics that can be used to improve exoskeleton design and compatibility with the work to be performed.

Hansen KK, Rasmussen P, Schlunssen V, Broberg K, Ostergaard K, Tranchant EE, et al. Microbial exposure during recycling of domestic waste: a cross-sectional study of composition and associations with inflammatory markers. Occupational and Environmental Medicine. 2024; 81(11):580-587.

<https://doi.org/10.1136/oemed-2024-109628> [open access]

Abstract: Objectives: This study aims to investigate (1) the microbial community composition by work

characteristics and (2) the association between microbial genera level and inflammatory markers among recycling workers. **Methods:** In this cross-sectional study, inhalable dust was collected with personal samplers from 49 production (86 samples) and 10 administrative workers (15 samples). Four groups of micro-organisms were identified down to species-level (aerobic and anaerobic bacteria, and fungi grown at 25°C and 37°C). Inflammatory markers were measured in serum collected at the end of the work shift. Microbial community composition was investigated using redundancy analysis and heatmaps. Associations between the most prevalent microbial genera and inflammatory markers were explored by mixed-effects regression. **Results:** Community composition of all groups of micro-organisms except fungi (37°C) differed between production and administrative workers and by type of waste and season among the production workers. Overall, *Bacillus*, *Staphylococcus*, *Aspergillus* and *Penicillium* were the most prevalent genera. CC16 concentrations increased with *Penicillium* genus level, C reactive protein and serum amyloid A with *Staphylococcus*, interleukin 2 (IL-2) and tumour necrosis factor with *Bacillus*, and IL-8 with *Aspergillus*. IL-1B decreased with *Staphylococcus* genus level. Remaining analyses showed no statistically significant associations between microbial genera level and inflammatory markers. **Conclusions:** Recycling workers are exposed to different compositions of microbial species than administrative workers depending on the type of waste handled and season. Specific systemic inflammatory effects were suggested for a limited number of microbial genera that need to be corroborated by future studies.

Hore-Lacy F, Gwini SM, Dimitriadis C, Jimenez-Martin J, Hoy RF, Fisher J, et al. Measuring improvements in occupational health and safety in the artificial stone benchtop industry. *Annals of Work Exposures and Health*. 2025; 69(1):5-16.

<https://doi.org/10.1093/annweh/wxae084> [open access]

Abstract: **OBJECTIVES:** Workers in the stone benchtop industry in Australia are at high risk of silicosis due to exposure to respirable crystalline silica (RCS) from the dry processing of artificial stone. In Victoria, Australia, a multifaceted response including education, regulatory changes, inspection site visits, and occupational health screening programme began in 2019. We aimed to review the success of this approach to safety practices in the industry. **METHODS:** Data were available from 2 sources: first, responses provided by workers during their occupational health screening (2019 to 2024), which included a systematic occupational history. Jobs examined included roles in the stone benchtop industry with RCS exposure and were analysed in relation to reported safety practices pre and postregulatory changes in August 2019, which prohibited unrestricted dry cutting. Second, data were obtained from the Regulator describing the numbers of visits to industry worksites and the numbers and types of compliance notices issued between 2018 and 2024. **RESULTS:** In total, 1921 jobs from 1007 workers were eligible for analysis, of which 869 were prior to the 2019 regulatory change and 557 commenced after. The proportion of workers reporting "never" dry cutting rose from 17.3% to 67.2% ($P < 0.001$), use of recommended ventilation and respirator increased from 26.0% to 36.5% ($P < 0.001$), and 44.9% to 86.5% ($P < 0.001$), respectively. Of the 543 worksites visited (2757 site visits in total), 352 (64.8%) received at least one compliance notice and the types of notices varied over time. Administrative controls/housekeeping and health monitoring notices were the most common in 2019 to 2021 but tools/equipment notices increased substantially in 2022 onwards. **DISCUSSION:** Prior to the changes, a large proportion of jobs involved unrestricted dry processing of artificial stone with inadequate protection. After the changes, practices improved although some jobs continued to involve dry processing without adequate control of dust. **CONCLUSIONS:** This multifaceted approach vastly

improved safety practices in the stone benchtop industry over 5 years. These data are relevant to occupational health and safety professionals and regulators in countries where artificial stone is used and potentially for implementation of new measures in response to a new workplace hazard in future

Korhonen PE, Kautiainen H, and Rantanen AT. Association of unemployment and increased depressive symptoms with all-cause mortality: follow-up study of a cardiovascular prevention programme. *European Journal of Public Health*. 2024; 34(6):1140-1145.

<https://doi.org/10.1093/eurpub/ckae175> [open access]

Abstract: Unemployment has been associated with increased risk of cardiovascular disease (CVD) and all-cause mortality. However, factors behind this association remain unsettled. A primary care CVD prevention programme was conducted in two Finnish towns in 2005-07. Of the participants (n = 4450), a cohort of apparently healthy CVD risk subjects belonging to the labour force (n = 1487) was identified. Baseline depressive symptoms were assessed by Beck's Depression Inventory. Data on employment status and mortality were obtained from official statistics. The effect of employment status and depressive symptoms on all-cause mortality after a median follow-up of 15 years was estimated in models adjusted for age, sex, body mass index, non-high-density lipoprotein cholesterol, physical activity, alcohol use, current smoking, glucose metabolism, and hypertension. In comparison to employed non-depressive subjects, fully adjusted hazard ratio (HR) for all-cause mortality was 3.53 (1.90-6.57) in unemployed subjects with increased depressive symptoms, 1.26 (0.68-2.34) in unemployed non-depressive subjects, and 1.09 (0.63-1.90) in employed depressive subjects. Factors independently associated with mortality were unemployment with increased depressive symptoms [HR 3.56 (95% CI 1.92-6.61)], screen-detected diabetes [HR 2.71 (95% CI 1.59-4.63)], current smoking [HR 1.77 (95% CI 1.19-2.65)], and higher age [HR 1.10 (95% CI 1.05-1.15)]. Unemployment in itself was not associated with all-cause mortality. If unemployment was accompanied with increased depressive symptoms, risk of death was significantly elevated.

Lin J, Kaufman B, Lin R, and Bao S. Sedentary behavior and musculoskeletal symptoms among work from home employees. *International Journal of Industrial Ergonomics*. 2024; 104:103653

<https://doi.org/10.1016/j.ergon.2024.103653>

Mekonnen TH, Russell G, Sheehan LR, Collie A, and Di Donato M. Factors associated with the timing of initial visit to healthcare providers for injured workers with low back pain claims: a multijurisdiction retrospective cohort. *Journal of Occupational Rehabilitation*. 2025; [epub ahead of print].

<https://doi.org/10.1007/s10926-025-10268-5>

Abstract: Purpose: Evidence shows that patient outcomes following musculoskeletal injury have been associated with the timing of care. Despite the increasing number of injured workers presenting with low back pain (LBP) in primary care, little is known about the factors that are associated with the timing of initial healthcare provider visits. This study investigated factors that are associated with the timing of initial workers' compensation (WC)-funded care provider visits for LBP claims. Methods: We used a retrospective cohort design. A standardised multi-jurisdiction database of LBP claims with injury dates from July 2011 to June 2015 was analysed. Determinants of the time to initial general practitioner (GPs) and or musculoskeletal (MSK) therapists were investigated using an accelerated failure time model, with a time ratio (TR) > 1 indicating a longer time to initial healthcare provider visit. Results: 9088 LBP claims were included. The median time to first healthcare provider visit was 3 days (interquartile range (IQR) 1-9). Compared to General practitioners (GPs) (median 3 days, IQR 1-8), the timing of initial consultation

was longer if the first healthcare providers were MSK therapists (median 5 days, IQR 2-14) ($p < 0.001$). Female workers had a shorter time to first healthcare provider visit [TR = 0.87; 95% CI (0.78, 0.97)] compared to males. It took twice as long to see MSK therapists first as it did to see GPs for injured workers [TR = 2.12; 95% CI (1.88, 2.40)]. Professional workers and those from remote areas also experienced delayed initial healthcare provider visits. Conclusions: The time to initial healthcare provider visit for compensable LBP varied significantly by certain occupational and contextual factors. Further research is needed to investigate the impact of the timing of initial visits to healthcare providers on claim outcomes.

de Miquel C, Haro JM, van der Feltz-Cornelis CM, Ortiz-Tallo A, Chen T, Sinokki M, et al. Differential attrition and engagement in randomized controlled trials of occupational mental health interventions in person and online: a systematic review and meta-analysis. *Scandinavian Journal of Work, Environment & Health*. 2024; 50(8):588-601.

<https://doi.org/10.5271/sjweh.4173> [open access]

Abstract: OBJECTIVE: This study systematically reviewed and meta-analyzed the differential attrition and utilization of occupational mental health interventions, specifically examining delivery methods (internet-based versus in-person). METHODS: The research, with papers spanning 2010-2024, involved filtering criteria and comprehensive searches across PubMed, Scopus, and Web of Science Core (PROSPERO registration n. CRD42022322394). Of 28 683 titles, 84 records were included in the systematic review, with 75 in meta-analyses. Risk of bias was assessed through the revised Cochrane risk of bias tool for randomized control trials and funnel plots. Differential attrition across studies was meta-analysed through a random-effects model with limited maximum-likelihood estimation for the degree of heterogeneity. RESULTS: Findings reveal higher mean differential attrition in the intervention group, indicating a potential challenge in maintaining participant engagement. The attrition rates were not significantly influenced by the mode of intervention delivery (internet versus in-person). Compensation for participation and year of publication could potentially influence differential attrition from baseline to follow-up measurements. CONCLUSIONS: These results suggest a need for cautious consideration of attrition in occupational mental health intervention study designs and emphasize the importance of adapting statistical analyses to mitigate potential bias arising from differential attrition

Omidi L, Karimi H, Pilbeam C, Mousavi S, and Moradi G. Safety leadership and safety citizenship behavior: the mediating roles of safety knowledge, safety motivation, and psychological contract of safety. *Theoretical Issues in Ergonomics Science*. 2025; 26(1):66-83.

<https://doi.org/10.1080/1463922X.2024.2364870>

Schwartzman BC, Lanchak ER, Carter EW, Guest LE, McMillan ED, and Taylor JL. Family perspectives on promoting paid employment for individuals with intellectual and developmental disabilities. *Rehabilitation Counseling Bulletin*. 2025; 68(2):79-91.

<https://doi.org/10.1177/00343552231213996> [open access]

Abstract: Although families can be critical partners in the pursuit of paid employment of individuals with intellectual and developmental disabilities (IDDs), their insights and experiences in this area are rarely explored. We interviewed 60 parents and other caregivers about the factors that could facilitate integrated employment for their family members with IDD. Participants described dozens of distinct practices and postures that contributed to finding and maintaining paid work in the community. Their recommendations spanned eight major categories: employment mindsets, skill development, family

supports, hands-on work experiences, employer connections, job fit, transportation, and workplace supports. We offer recommendations for research and practice aimed at increasing access to the array of benefits that come through meaningful work in one's community.

Smith CE, Lee S, Allen TD, Wallace ML, Andel R, Buxton OM, et al. Designing work for healthy sleep: a multidimensional, latent transition approach to employee sleep health. *Journal of Occupational Health Psychology*. 2024; 29(6):409-430.

<https://doi.org/10.1037/ocp0000386>

Abstract: Healthy sleep is essential to employee well-being and productivity, but many modern workers do not obtain adequate sleep. Are technology-related changes to job design (i.e., computer use, sedentary work, nontraditional work schedules) related to long-term worsening of employee sleep health? The present study seeks to address this question using nationally representative data from the Midlife in the United States study, which includes detailed information on sleep duration, regularity, sleep onset latency, insomnia symptoms, napping, and daytime tiredness from full-time workers (N = 1,297) at two time points separated by approximately 10 years. Using latent transition analysis to consider how these sleep health dimensions co-occur, we identify three multidimensional sleep health phenotypes at both time points: good sleepers, catch-up sleepers, and insomnia sleepers. Sedentary work is linked to the insomnia sleeper phenotype. Nontraditional work schedules are linked to the catch-up sleeper phenotype. These findings test assumptions of modern models of job design regarding the impact of technology on employee sleep health and advance measurement of sleep health in the organizational sciences to be multidimensional and dynamic. Further, results point to specific sleep needs in the working adult population and identify potential points of intervention via job design. (PsycInfo Database Record (c) 2024 APA, all rights reserved)

Tahernejad A, Makki F, Rezaei E, Marzban H, Tahernejad S, and Sahebi A. Musculoskeletal disorders in emergency medical services personnel: a systematic review and meta-analysis. *Public Health*. 2024; 237:107-115.

<https://doi.org/10.1016/j.puhe.2024.08.020>

Abstract: Objectives: Emergency medical services personnel are frequently subjected to strenuous physical tasks, such as lifting and moving patients, as well as working in awkward postures. These activities can result in a variety of debilitating injuries, including musculoskeletal disorders (MSDs). As a result, this systematic review and meta-analysis study aimed to examine the frequency of MSDs among emergency medical services personnel. Study design: Systematic review and meta-analysis. Methods: This systematic review and meta-analysis study was conducted based on the PRISMA guidelines. The protocol of this work is registered in PROSPERO with the code CRD42024506958. Searches were conducted without time limits in several databases including PubMed, Scopus, Web of Science, Science Direct, SID, ISC, and Google Scholar until February 12, 2024. The I2 index was used to assess heterogeneity, and random effects model was used for meta-analysis. Data were analyzed using STATA version 14. Results: A total of 709 articles were obtained by initial search in the mentioned databases. Following a thorough screening and quality assessment, 27 articles were chosen for meta-analysis. The findings revealed that the overall prevalence of MSDs among emergency medical services personnel is 56.52% (95% CI: 35-78.04, I2 = 99.8%, P < 0.001) and the prevalence in different areas of the body are as follows: the low back (47.38%), upper back (35.15%), neck (31.19%), shoulder (30%), knee (27.07%), hand (20.70%), hip/thigh (19.48%), feet (19.11%), and elbow (17.36%). Conclusion: The prevalence of

MSDs among emergency medical services personnel is very high. Considering the importance of the role of these employees and the specific risk factors of their jobs, it is recommended that periodic screening is prioritized. In addition, attention should be paid to the ergonomic evaluation of the work environment and the design of appropriate ergonomic interventions.

Zhang C, Young A, Rodriguez S, Schulze KA, Surti B, Najem F, et al. Impacts of hazardous noise levels on hearing loss and tinnitus in dental professionals. *Journal of Occupational Medicine and Toxicology*. 2025; 20(1):1.

<https://doi.org/10.1186/s12995-024-00447-0> [open access]

Abstract: **BACKGROUND:** Hazardous noise exposure is an important health concern in many workplaces and is one of the most common work-related injuries in the United States. Dental professionals are frequently exposed to high levels of occupational noise in their daily work environment. This noise is generated by various dental handpieces such as drills, suction, and ultrasonic scalers. Prolonged exposure to such noise levels is known to have adverse effects on hearing health. Despite the prevalence of occupational noise in dentistry, there is a paucity of research specifically examining the prevalence of hearing loss and tinnitus in dental professionals. **METHODS:** To evaluate the prevalence of hearing loss and tinnitus, data were collected from 60 dental professionals, including participant demographics and audiometric thresholds. Thresholds were compared to the age- and sex-based reference ranges from the International Standards Organization (ISO 7029:2017). **RESULTS:** Results showed that 15-25% of males and 13-18% of females had hearing thresholds that exceeded 95th percentile limits based on the ISO normative age- and sex-distributions. Tinnitus was reported in 40% of the participants. **CONCLUSION:** This study is the first to examine the characteristics and prevalence of auditory dysfunctions in dental professionals compared to the ISO normative age and sex distributions of hearing status. Findings from this study highlight the need for increasing the awareness of occupational noise hazards among dental professionals and the importance of routine audiological monitoring

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