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April 23, 2021

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***Nielsen SM, Boers M, deWit M, Shea B, Van Der Windt DA, Reeves BC, Beaton D, et al. OMERACT consensus-based operational definition of contextual factors in rheumatology clinical trials: a mixed methods study. *Seminars in Arthritis and Rheumatism*. 2021; [epub ahead of print].**

<https://doi.org/10.1016/j.semarthrit.2021.03.013>

Abstract: OBJECTIVES: To develop an operational definition of contextual factors (CF) [1]. METHODS: Based on previously conducted interviews, we presented three CF types in a Delphi survey; Effect Modifying -, Outcome Influencing - and Measurement Affecting CFs. Subsequently, a virtual Special Interest Group (SIG) session was held for in depth discussion of Effect Modifying CFs. RESULTS: Of 161 Delphi participants, 129 (80%) completed both rounds. After two rounds, we reached consensus ($\geq 70\%$ agreeing) for all but two statements. The 45 SIG participants were broadly supportive. CONCLUSION: Through consensus we developed an operational definition of CFs, which was well received by OMERACT members

***Sears JM, Schulman BA, Fulton-Kehoe D, and Hogg-Johnson S. Workplace organizational and psychosocial factors associated**



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with return-to-work interruption and reinjury among workers with permanent impairment. *Annals of Work Exposures and Health*. 2021; [epub ahead of print].

<https://doi.org/10.1093/annweh/wxaa133>

Abstract: **OBJECTIVES:** Roughly 10% of occupational injuries result in permanent impairment and a permanent partial disability (PPD) award. After initial return to work (RTW) following a work injury, many workers with permanent impairment face RTW interruption (breaks in ongoing employment due to reinjury, poor health, disability, lay-off, etc.). Most RTW and reinjury research has focused on worker-level risk factors, and less is known about contextual factors that may be amenable to workplace or workers' compensation (WC)-based interventions. The aim of this study was to identify modifiable organizational and psychosocial workplace factors associated with (i) RTW interruption and (ii) reinjury among workers with a permanent impairment. **METHODS:** This retrospective cohort study included WC claims data and survey data for 567 injured workers who RTW at least briefly after a work-related injury that resulted in permanent impairment. Workers were interviewed once by phone, 11-15 months after WC claim closure with a PPD award. Logistic regression models were used to estimate associations between each workplace factor of interest and each outcome, controlling for whole body impairment percentage, gender, age, nativity, educational level, State Fund versus self-insured WC coverage, employer size, union membership, industry sector, and employment duration of current/most recent job. **RESULTS:** Twelve percent of workers had been reinjured in their current or most recent job, 12% of workers were no longer working at the time of interview, and <1% of workers reported both outcomes. The most frequently reported reason for RTW interruption was impairment, disability, and/or pain from the previous work injury. Lower reported levels of safety climate, supervisor support, and ability to take time off work for personal/family matters were significantly associated with both RTW interruption and reinjury. Inadequate employer/health care provider communication, perceived stigmatization from supervisors and/or coworkers, and lower levels of coworker support were significantly associated with RTW interruption but not with reinjury. Discomfort with reporting an unsafe situation at work, absence of a health and safety committee, and higher job strain were significantly associated with reinjury, but not with RTW



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interruption. Inadequate safety training and lack of needed job accommodations were not significantly associated with either outcome. There were no notable or statistically significant interactions between workplace factors and degree of impairment, and no consistent direction of association. **CONCLUSIONS:** This study provides evidence that several potentially modifiable organizational and psychosocial factors are associated with safe and sustained RTW among injured workers with work-related permanent impairment. The lack of interaction between any of these workplace factors and degree of impairment suggests that these findings may be generalizable to all workers, and further suggests that workplace interventions based on these findings might be useful for both primary and secondary prevention. Though primary prevention is key, secondary prevention efforts to sustain RTW and prevent reinjury may reduce the considerable health, economic, and social burden of occupational injury and illness

Amaro J, Ubalde-Lopez M, and Lucas R. History of work-related health problems in a population-based sample of women: an exploratory factor analysis. *Work*. 2021; 68(3):563-576.

<https://doi.org/10.3233/WOR-203394>

Abstract: **BACKGROUND:** Beyond the health-enhancing effects, work also has the potential of causing or worsening different health conditions in the same individual. However, research on within-worker aggregation of work-related health problems is scarce.

OBJECTIVE: To describe the history and aggregation of work-related health problems in a population-based sample of women.

METHODS: A total of 4330 women were asked whether they had ever had "a physical or mental health problem that was caused or made worse by your work". The aggregation of work-related health problems was assessed using an exploratory factor analysis.

RESULTS: Five groups were identified. Factor 1 included all items on musculoskeletal disorders - lower socioeconomic position, higher BMI, smokers and history of occupational accidents. Factor 2 included mental disorders together with headache and/or eyestrain - higher socioeconomic position. Factor 3 included the other disorders item with some loading from digestive disorders - older and public sector workers. Factor 4 included respiratory disorders - lower socioeconomic position and history of occupational accidents. Factor



5 included hearing and ear problems - blue-collar workers.
CONCLUSION: There was a relevant aggregation of work-related health problems, which may inform the selection of specific components for interventions that aim to improve women's work-related health

Bandini J, Rollison J, Feistel K, Whitaker L, Bialas A, and Etchegaray J. Home care aide safety concerns and job challenges during the COVID-19 pandemic. *New Solutions*. 2021; 31(1):20-29.

<https://doi.org/10.1177/1048291120987845>

Abstract: Home care aides are on the frontlines providing care to vulnerable individuals in their homes during the COVID-19 pandemic yet are often excluded from policies to protect health care workers. The goal of this study was to examine experiences of agency-employed home care aides during the COVID-19 pandemic and to identify ways to mitigate concerns. We used an innovative journaling approach with thirty-seven aides as well as in-depth interviews with fifteen aides and leadership representatives from nine home health agencies in New York and Michigan. Workers described a range of concerns around workplace safety including uncertainty around whether a client had COVID-19, inadequate access to personal protective equipment and safe transportation, as well as fundamental changes to interactions with clients. Agencies also faced challenges acquiring personal protective equipment for their aides. This research points to needed resources to support home care aides and home health agencies both during a public health crisis and in the future

Chang WP and Peng YX. Differences between fixed day shift nurses and rotating and irregular shift nurses in work-related musculoskeletal disorders: a literature review and meta-analysis. *Journal of Occupational Health*. 2021; 63(1):e12208.

<https://doi.org/10.1002/1348-9585.12208> [open access]

Abstract: Objectives: Work-related musculoskeletal disorders (WMSDs) are common occupational injuries for nurses. Furthermore, rotating and irregular shift work may exacerbate muscle tension and pain in nurses. The objective of this study was to examine the differences between fixed day shift (FDS) nurses and rotating and irregular shift (RS + IS) nurses in WMSDs using a systematic



literature review and meta-analysis. Methods: Databases including PubMed, CINAHL, Cochrane Library, EBSCOhost, and Google Scholar were searched for relevant studies published between 2010 and 2020 using the target keywords. Results: This study obtained data on a total of 18 199 nurses, among which 12 786 comprised the RS + IS group and 5413 constituted the FDS group. The result of the heterogeneity test was $Q = 79.27$ ($P < .001$) and $I^2 = 57.11\%$, indicating that heterogeneity existed among the studies. Subgroup analyses were also conducted with four groups: neck pain ($n = 1818$), shoulder and upper limb pain ($n = 2525$), back pain ($n = 11 962$), and hip and lower limb pain ($n = 1894$). Significant differences were found between the RS + IS group and the FDS group with regard to back pain, with the forest plot presenting an odds ratio equaling 1.40 (95% CI: 1.19-1.64, $P < .001$). Conclusions: This meta-analysis indicated that RS + IS nurses are more likely to experience back pain associated with WMSD than are FDS nurses. The results can serve as a reference to the clinical management for work improvement and thereby reduce or prevent the adverse effects of rotating and irregular shift work on back pain experienced by nurses.

Dol M, Varatharajan S, Neiterman E, McKnight E, Crouch M, McDonald E, et al. Systematic review of the impact on return to work of return-to-work coordinators. Journal of Occupational Rehabilitation. 2021; [epub ahead of print].

<https://doi.org/10.1007/s10926-021-09975-6>

Abstract: Purpose We conducted a systematic review to understand the impact that return-to-work coordinators (RTWCs) have on return to work (RTW) outcomes for sick/injured workers. Methods MEDLINE, EMBASE, CINAHL, PsycINFO, Web of Science, and ABI Inform were searched from January 1, 2000 to September 16, 2020. Of 2,927 retrieved and screened citations, 14 quantitative articles fulfilled the eligibility and quality criteria. Quality assessment, data extraction, and evidence synthesis followed article screening. Results We focused on the impact of RTWCs for outcomes of work absence, RTW rates, quality of life, and cost-benefit. Our final synthesis included 14 articles. We found strong evidence that work absence duration was reduced when workers had face-to-face contact with a RTWC. As well, there was strong evidence linking face-to-face RTWC interventions with higher RTW rates and moderate evidence



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that this reduced intervention costs. RTWC interventions involving the identification of barriers and facilitators to RTW also showed promising results. However, only limited evidence was found that RTWCs improved quality of life for workers. Conclusions Our synthesis identifies key features of RTW interventions that improve RTW outcomes. Future high-quality research should measure long-term outcomes of RTWC interventions to evaluate sustainability and consider the nature of work. They should also focus on RTWC impact on worker quality of life assessments and for older workers and workers with chronic health conditions

Hasle P, Madson CU, and Hansen D. Integrating operations management and occupational health and safety: a necessary part of safety science! Safety Science. 2021; 139:105247. <https://doi.org/10.1016/j.ssci.2021.105247>

Jun S and Wu J. Words that hurt: leaders' anti-Asian communication and employee outcomes. Journal of Applied Psychology. 2021; 106(2):169-184. <https://doi.org/10.1037/apl0000873>

Abstract: With the outbreak of COVID-19, there have been growing reports of racial harassment targeting Asian Americans. We study one such manifestation of racial harassment that Asian employees may face in the workplace: Leaders' use of stigmatizing labels for COVID-19 such as the "Chinese Virus" and "Kung Flu." Integrating organizational justice theories with research on racial harassment in the workplace, we theorize that leaders' use of stigmatizing COVID-19 labels reduces employees' perceptions of interpersonal justice, which subsequently impact employees' emotional exhaustion and work engagement. We further theorize that while such effects will be stronger among Asian employees who experience both moral anger and reduced public collective self-esteem, that the effects will also be present among non-Asian employees who experience moral anger. Using one survey (Study 1) and one experiment (Study 2), we find support for our predictions. We find that leaders' use of stigmatizing language to depict COVID-19 leads to deleterious workplace experiences for employees, and especially for Asian employees. The current research thus deepens our understanding of the relatively understudied work experiences of Asian Americans and brings to



light the underlying psychological mechanisms linking racial harassment and employee work outcomes for both targeted employees and employees not targeted. (PsycInfo Database Record (c) 2021 APA, all rights reserved)

Knani M, Fournier PS, and Biron C. Presenteeism in small and medium-sized enterprises: determinants and impacts on health. Work. 2021; 68(3):733-747.

<https://doi.org/10.3233/WOR-203407>

Abstract: **BACKGROUND:** Small and medium sized enterprises are yet uncharted territory in terms of presenteeism. In addition, the Demand-Control-Support (DCS) and Siegrist's Effort-Reward Imbalance (ERI) models are proposed to predict stress-related health problems, but not for sickness behaviors such as presenteeism. **OBJECTIVE:** This study aims to examine the relationships between psychosocial risk factors, presenteeism, mental and physical health in the context of small and medium-sized enterprises (SMEs). This study also examines the moderating effect of company size on these associations. **METHODS:** To test the association between psychosocial risks, presenteeism, and health, only people working in small and medium-sized enterprises (SMEs) of between 2 and 199 employees were included in the sample, giving a total of 2,525 SME employees surveyed. To test the differences in exposure to psychosocial risk and presenteeism, and the moderating impact of size on the relationship between psychosocial risks, presenteeism, and health, we took the original sample (4608) of the EQCOTESST. **RESULTS:** The results confirm the associations between job demands, social support and effort-reward imbalance, and presenteeism. Also, the associations between presenteeism and health problems in SMEs' context. Multi-group analyses show that the business's size does not moderate the strength of the relationships between psychosocial risks, presenteeism and health. **CONCLUSION:** The current study highlights that SMEs are somehow protected from certain psychosocial constraints such as high job demands, and low social support, but are more exposed to others such as effort-reward imbalance

Koch LC, Rumrill PD, and Chan F. Multiple sclerosis in the COVID-19 era: vocational rehabilitation strategies to meet the



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needs of a growing and immune-vulnerable clientele. *Journal of Vocational Rehabilitation*. 2021; 54(2):175-183.

<https://doi.org/10.3233/JVR-201128>

Levi P, Patrician PA, Vance DE, Montgomery AP, and Moss J. Post-traumatic stress disorder in intensive care unit nurses: a concept analysis. *Workplace Health & Safety*. 2021; 69(5):224-234.

<https://doi.org/10.1177/2165079920971999>

Abstract: BACKGROUND: Intensive care unit (ICU) nurses are at an increased risk of post-traumatic stress disorder (PTSD) due to their stressful work environment. Using the Walker and Avant conceptual analysis method, we sought to review the literature to better understand PTSD as it pertained to ICU nurses and its impact on their lives, patient care, and health care organizations. METHODS: For the review, we searched the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, and PsycINFO. The keyword searches included the terms "post-traumatic stress disorder" AND "psychological stress" AND "intensive care unit nurses."

Abstract and full text reviews were conducted. Ten articles met our inclusion criteria of being published in the past 10 years (2010-2020), peer reviewed, written in English, and referred specifically to PTSD and psychological stress in ICU nurses. FINDINGS: Antecedents for PTSD in ICU nurses are their stressful work environment, where exposure to traumatic events is experienced, and a lack of support from their manager, coworkers, and organization. Defining attributes for ICU nurses with PTSD included reexperiencing, avoidance, negative alterations in cognition and mood, and hyperarousal.

Consequences identified included burnout, job dissatisfaction, and the intention to leave their job. The conceptual definition of PTSD in ICU nurses was illustrated by the attributes, antecedents, consequences, model case, empirical referents, and by the negative impact on the nurse, patients, and the health care organization.

CONCLUSION/APPLICATION TO PRACTICE: Hospital administrators, nurse managers, and occupational health nurses should ensure that policies and interventions are in place to recognize and reduce the risk of PTSD among ICU nurses



Moran ME, Hodgson JL, Jensen JF, and Wood TL. Musculoskeletal injury survivors' resiliency: a systematic review. Disability and Health Journal. 2021; 14(2):100987.

<https://doi.org/10.1016/j.dhjo.2020.100987>

Abstract: **BACKGROUND:** Musculoskeletal traumas are on the rise in the United States; however, limited studies are available to help trauma providers assess and treat concerns beyond the physical impact. Little is understood about the psychological, social, and spiritual factors that protect patients from adverse effects after a physical trauma or their experiences with each factor afterward. **OBJECTIVE:** This systematic review was conducted to investigate and review advancements in research related to risk and resiliency factors experienced by survivors of traumatic musculoskeletal injuries. The use of biopsychosocial-spiritual (BPS-S) framework and resiliency theory guided the analysis. **METHODS:** Researchers reviewed 1003 articles, but only seven met the search criteria. Due to the complexity and uniqueness of traumatic brain injuries, studies on that target population were excluded. **RESULTS:** Of the seven articles reviewed, three identified psychological protective factors that protect against negative health outcomes; three identified negative psychological, social, or spiritual outcomes; and none investigated social or spiritual health. **CONCLUSIONS:** There are significant gaps in the literature surrounding risk and resiliency factors related to the BPS-S health of musculoskeletal injury survivors

Nielsen K, Shepherd R, Vignoli M, and Prieto LL. The integrated migrant worker safety training evaluation model: IMSTEM. Safety Science. 2021; 139:105246.

<https://doi.org/10.1016/j.ssci.2021.105246>

Oddo VM, Zhuang CC, Andrea SB, Eisenberg-Guyot J, Peckham T, Jacoby D, et al. Changes in precarious employment in the United States: a longitudinal analysis. Scandinavian Journal of Work, Environment & Health. 2021; 47(3):171-180.

<https://doi.org/10.5271/sjweh.3939> [open access]

Abstract: Objective This longitudinal study aimed to measure precarious employment in the US using a multidimensional indicator. Methods We used data from the National Longitudinal Survey of Youth (1988-2016) and the Occupational Information Network



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database to create a longitudinal precarious employment score (PES) among 7568 employed individuals over 18 waves (N=101 290 observations). We identified 13 survey indicators to operationalize 7 dimensions of precarious employment, which we included in our PES (range: 0-7, with 7 indicating the most precarious): material rewards, working-time arrangements, stability, workers' rights, collective organization, interpersonal relations, and training. Using generalized estimating equations, we estimated the mean PES and changes over time in the PES overall and by race/ethnicity, gender, education, income, and region. Results On average, the PES was 3.17 [standard deviation (SD) 1.19], and was higher among women (3.34, SD 1.20), people of color (Hispanics: 3.24, SD 1.23; non-Hispanic Blacks: 3.31, SD 1.23), those with less education (primary: 3.99, SD 1.07; high school: 3.43, SD 1.19), and with lower-incomes (3.84, SD 1.08), and those residing in the South (3.23, SD 1.17). From 1988 to 2016, the PES increased by 9% on average [0.29 points; 95% confidence interval (CI) 0.26-0.31]. While precarious employment increased over time across all subgroups, the increase was largest among males (0.35 points; 95% CI 0.33-0.39), higher-income (0.39 points; 95% CI 0.36-0.42) and college-educated (0.37 points; 95% CI 0.33-0.41) individuals. Conclusions Long-term decreases in employment quality are widespread in the US. Women and those from racialized and less-educated populations remain disproportionately precariously employed; however, we observed the largest increases among men, college graduates and higher-income individuals

Reneman MF, Beemster TT, Welling SJ, Mierau JO, and Dijk HH. Vocational rehabilitation for patients with chronic musculoskeletal pain with or without a work module: an economic evaluation. Journal of Occupational Rehabilitation. 2021; 31(1):84-91.

<https://doi.org/10.1007/s10926-020-09921-y> [open access]

Abstract: Purpose Vocational rehabilitation (VR) is a widely used intervention aimed to optimize work participation for patients on sick leave due to chronic musculoskeletal pain (CMP). Economic evaluations of care as usual VR are scarce, and may provide relevant information to guide clinical, reimbursement and policy decisions. The aim of this study was to evaluate the short-term cost-effectiveness and return on investment (ROI) of VR for patients on sick leave due



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to CMP with an additional work module (VR+) compared to VR without work module, from a societal and employers' perspective. Methods A retrospective longitudinal cohort study within a Dutch care as usual context was applied. Participants with CMP and decreased work participation originating from seven Dutch rehabilitation centers were included in this study. Participants underwent VR or VR+. Main data sources at baseline and discharge: Quality-adjusted life year (QALY) based on EQ-5D, intervention costs, self-reported productivity and health care utilization. Main analyses cost-effectiveness, including incremental cost-effectiveness ratio (ICER) and a cost-effectiveness acceptability curve (CEAC); and ROI analyses with use of the human capital method. Results N = 324 participants were analyzed. The results show that VR+ was cost-effective compared to VR: mean cost savings of €820 per 0.012 QALY gained. CEAC suggests probability of VR+ being cost-effective is > 0.91 for thresholds of €20.000 and higher. The mean ROI of VR+ for employers was 38%. Conclusion It was concluded that at discharge, VR+ was cost-effective compared to VR. ROI was positive for employers.

Soderberg M, Stattin M, Robroek SJ, Burdorf A, and Jarvholm B. Industry mobility and disability benefits in heavy manual jobs: a cohort study of Swedish construction workers. *Scandinavian Journal of Work, Environment & Health*. 2021; 47(3):217-223.

<https://doi.org/10.5271/sjweh.3932> [open access]

Abstract: Objectives This study aimed to investigate whether change from the construction industry to work in other industries at age 45-55 years lowered risks of disability benefits (DB) later in life (60-64 years of age). We hypothesized that risks would be lowered the most among those changing from the heaviest occupations. Methods The study included men employed in the construction industry during 1971-1993. We selected workers from the largest occupational groups in heavy (concrete workers and painters) and less heavy (drivers, electricians and foremen) occupations. The occurrence of DB in 1990-2015 was retrieved from national registers. Regression analyses were used to calculate relative risks (RR) of DB at 60-64 years, comparing those working in other industries to those still in the construction industry at the age of 45, 50 and 55 years. Results Shifting out of from the construction industry was related to lowered



DB risks at 60-64 years in all selected occupations. Effects were most pronounced among those who, at 55 years of age, worked in an industry other than construction, with significantly reduced RR for DB among concrete workers [RR 0.63, 95% confidence interval (CI) 0.51-0.77], electricians (RR 0.61, 95% CI 0.47-0.77) and foremen (RR 0.78, 95% 0.63-0.96). Conclusions Risks for DB at 60-64 years of age were reduced among those who changed from construction work to other industries. Notable reductions were observed among workers originating from both heavy and less heavy occupations, and future studies should explore other factors, in addition to heavy workload, as motivators for leaving the construction industry

Wei H, Rahman MA, Hu X, Zhang L, Guo L, Tao H, et al. Robotic Mounted Rail Arm System for implementing effective workplace safety for migrant workers. Work. 2021; 68(3):845-852.

<https://doi.org/10.3233/WOR-203418>

Abstract: BACKGROUND: The selection of orders is the method of gathering the parts needed to assemble the final products from storage sites. Kitting is the name of a ready-to-use package or a parts kit, flexible robotic systems will significantly help the industry to improve the performance of this activity. In reality, despite some other limitations on the complexity of components and component characteristics, the technological advances in recent years in robotics and artificial intelligence allows the treatment of a wide range of items. OBJECTIVE: In this article, we study the robotic kitting system with a Robotic Mounted Rail Arm System (RMRAS), which travels narrowly to choose the elements. RESULTS: The objective is to evaluate the efficiency of a robotic kitting system in cycle times through modeling of the elementary kitting operations that the robot performs (pick and room, move, change tools, etc.). The experimental results show that the proposed method enhances the performance and efficiency ratio when compared to other existing methods. CONCLUSION: This study with the manufacturer can help him assess the robotic area performance in a given design (layout and picking a policy, etc.) as part of an ongoing project on automation of kitting operations

Wong TKM, Man SS, and Chan AHS. Exploring the acceptance of PPE by construction workers: an extension of the technology



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acceptance model with safety management practices and safety consciousness. *Safety Science*. 2021; 139:105239.

<https://doi.org/10.1016/j.ssci.2021.105239>

Xu J, Cheung C, Manu P, and Ejohwomu O. Safety leading indicators in construction: a systematic review. *Safety Science*. 2021; 139:105250.

<https://doi.org/10.1016/j.ssci.2021.105250>

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