

IWH Research Alert
January 25, 2019

Missed an issue? Catch up on previous *Research Alerts* available on the IWH website <https://www.iwh.on.ca/journal-articles/research-alerts>

Research Alert is a service provided to you by the Institute for Work & Health (IWH) to help you keep abreast of recent literature in the areas of occupational health and safety, epidemiology, public health and others within the IWH mandate. Please note that these articles have not been reviewed by Institute scientists to assess the quality of the studies. *Research Alerts* should not be considered an endorsement of the findings. Readers are cautioned not to act on the results of single studies, but rather to seek bodies of evidence. It should also be noted that the Institute for Work & Health cannot provide full-text of articles listed in *Research Alerts* to individuals outside of the organization, as this violates copyright legislation.

Airagnes G, Lemogne C, Olekhovitch R, Roquelaure Y, Hoertel N, Goldberg M, et al. Work-related stressors and increased risk of benzodiazepine long-term use: findings from the CONSTANCES population-based cohort. *American Journal of Public Health*. 2019;109(1):119-125.

<https://doi.org/10.2105/AJPH.2018.304734>

Abstract: OBJECTIVES: To examine whether stressful job exposure to the public could be associated with having long-term benzodiazepine use. METHODS: From the participants included between 2012 and 2016 in the French population-based CONSTANCES cohort, 13 934 men and 19 261 women declared a daily job exposure to the public and rated the frequency of stressful exposure. We examined benzodiazepine long-term use by using drug reimbursement administrative registries. Logistic regressions provided odds ratios (ORs) of benzodiazepine long-term use, with stratification for gender and adjustment for age, education, and area deprivation index. Occupational grade, job strain, depression, self-rated health, and alcohol use disorder were additional stratification variables. RESULTS: Benzodiazepine long-term use was positively associated with stressful exposure to the public ("often or always" vs "rarely or never") in men (OR = 2.2; 95% confidence interval [CI] = 1.8, 2.8) and women (OR = 1.6; 95% CI = 1.4, 1.9), with dose-dependent relationships (P trends < .001). Adjustments and analyses in subgroups without other individual or environmental vulnerability factors led to similar results. CONCLUSIONS: Stressful job exposure to the public increases the risk of benzodiazepine long-term use. Prevention programs aiming at reducing the burden of benzodiazepine

long-term use would benefit in targeting this specific population. (Am J Public Health. Published online ahead of print November 29, 2018: e1-e7. doi:10.2105/AJPH.2018.304734)

Blustein DL, Kenny ME, Di Fabio A, and Guichard J. Expanding the impact of the psychology of working: engaging psychology in the struggle for decent work and human rights. Journal of Career Assessment. 2018; 27(1):3-28.

<https://doi.org/10.1177/1069072718774002>

Abstract: Building on new developments in the psychology of working framework (PWF) and psychology of working theory (PWT), this article proposes a rationale and research agenda for applied psychologists and career development professionals to contribute to the many challenges related to human rights and decent work. Recent and ongoing changes in the world are contributing to a significant loss of decent work, including a rise of unemployment, underemployment, and precarious work across the globe. By failing to satisfy human needs for economic survival, social connection, and self-determination, the loss of decent work undermines individual and societal well-being, particularly for marginalized groups and those without highly marketable skills. Informed by innovations in the PWF/PWT, we offer exemplary research agendas that focus on examining the psychological meaning and impact of economic and social protections, balancing caregiving work and market work, making work more just, and enhancing individual capacities for coping and adapting to changes in the world of work. These examples are intended to stimulate new ideas and initiatives for psychological research that will inform and enhance efforts pertaining to work as a human right

Chu PC, Chin WS, Guo YL, and Shiao JS. Long-term effects of psychological symptoms after occupational injury on return to work: a 6-year follow-up. International Journal of Environmental Research and Public Health. 2019; 16(2):E235.

<https://doi.org/10.3390/ijerph16020235> [open access]

Abstract: Psychological factors may compromise return to work among workers with occupational injuries, and little is known about the long-term consequences of psychological symptoms relating to return to work. The study examined the impact of psychological symptoms on return to work as well as exploring factors associated with return to work among injured workers. A total of 572 workers who experienced occupational injuries were recruited in this prospective cohort study. Surveys of the psychological symptoms using the 5-item Brief Symptom Rating Scale (BSRS-5) were conducted at 3 and 12 months after the injury. All of the workers were invited to join the study at year 6 after the injury.

Sociodemographic factors, psychological symptoms, injury severity, and return-to-work status were collected. Approximately 10% of injured workers could not return to work even 6 years after the injury. Severe psychological symptoms within 1 year after the injury presented a significant risk factor for not returning to

work 6 years after the injury (adjusted OR = 0.7, 95% CI: 0.5(-)0.8). Furthermore, age, education level, length of hospitalization, and injury-induced changes in appearance had significant independent influence on return to work as well. These findings highlight the importance of the effects of mental health within 1 year post injury on return to work, and support the concept of early screening, detection, and intervention in at-risk occupational injured workers with severe psychological symptoms

Collie A, Di Donato M, and Iles R. Work disability in Australia: an overview of prevalence, expenditure, support systems and services. Journal of Occupational Rehabilitation. 2018; [Epub ahead of print].

<https://doi.org/10.1007/s10926-018-9816-4>

Abstract: Purpose This study sought to describe Australian systems of income support for people with work disability. Specific aims were to summarise and compare the features of the income support systems, including the rehabilitation and employment services funded or provided by those systems, and factors affecting transition between systems. Further objectives were to estimate the prevalence of work disability in Australia and the national expenditure on work disability income support. Methods A mixed methods project involving collation and analysis of existing publicly available documentation and data, and interviews with 25 experts across ten major systems of income support. The prevalence of work disability and expenditure in each system, and in total, was estimated using publicly accessible data sources. System features and service models were synthesised from data sources, tabulated and compared qualitatively. Results In Australia during the 2015/2016 financial year an estimated 786,000 people with work disability received income support from a Commonwealth, state, territory or private source. An additional 6.5 million people accessed employer provided leave entitlements for short periods of work incapacity. A total of \$37.2 billion Australian dollars was spent on income support for these people during the year. This support was provided through a complex array of government authorities, private sector insurers and employers. Service models vary substantially between systems, with case management the only service provided across all systems. Healthcare and return to work services were provided in some systems, although models differed markedly between systems. Income support ranged from 19 to 100% of earnings for a person earning the average weekly Australian wage pre-disability. There is a paucity of information relating to movement between systems of support, however it is likely that many thousands of people with long periods of work disability transition between systems annually. Conclusions This study demonstrates the substantial financial and human impact of work disability on Australian society. Findings indicate multiple opportunities for reducing the burden of work disability, including aligning case management and healthcare service models, and engaging employers in prevention and rehabilitation. The findings suggest a need for greater interrogation and evaluation of Australian work disability support systems

Dewa CS, Hoch JS, Nieuwenhuijsen K, Parikh SV, and Sluiter JK. Toward effective work accommodations for depression: examining the relationship between different combinations of depression symptoms and work productivity losses. Journal of Occupational & Environmental Medicine. 2019; 61(1):75-80.

<https://doi.org/10.1097/JOM.0000000000001486>

Abstract: OBJECTIVE: Heterogeneity of depression experiences has led to suggestions that interventions focus on depression symptom combinations rather than depression severity alone. Our analyses explore the question, "What is the relationship between different combinations of depression symptoms and work productivity losses?" METHODS: These analyses use a population-based sample of 2219 working adults. Using the PHQ-8 items, cluster analysis methods were used to identify depression symptom clusters. The Work Limitations Questionnaire's four work productivity loss dimensions were regressed on the identified depression symptoms clusters. RESULTS: The symptoms clusters of workers with mild to moderate depression had significant but similar work productivity losses. However, the symptom combinations within these clusters of workers varied. CONCLUSION: To create effective work accommodations, attention should focus on the combinations of depression symptoms and specific job characteristics rather than severity alone

Farina E, Bianco S, Bena A, and Pasqualini O. Finding causation in occupational fatalities: a latent class analysis. American Journal of Industrial Medicine. 2019; 62(2):123-130.

<https://doi.org/10.1002/ajim.22936>

Abstract: BACKGROUND: The method "Learning by mistakes" was developed in Italy to conduct occupational injury investigations and to collect information on the genesis of injuries. The aim is to analyze data classified with this method in order to identify patterns among the factors contributing to injury dynamics. METHODS: Data regarding 673 factors, corresponding to 354 occupational fatalities that occurred in the Piedmont region (north-west of Italy) during 2005-2014 were considered. Latent Class Analysis (LCA) was applied to find patterns among these factors. RESULTS: The eight-class model was selected. Most of the factors fell in the class "Fall from height or vehicle rollover due to incorrect practice" (40.56%) while the remaining factors were heterogeneously distributed in the other classes. CONCLUSIONS: All the classes found allow for a logical interpretation. Systematic use of LCA could aid in uncovering new, unexpected patterns of factors not otherwise detectable by analysis of the single fatal accident

Franklin GM, Mercier M, Mai J, Tuman D, Fulton-Kehoe D, Wickizer T, et al. Brief report: population-based reversal of the adverse impact of opioids on disability in Washington State workers' compensation. American Journal of Industrial Medicine. 2019; 62(2):168-174.

<https://doi.org/10.1002/ajim.22937>

Abstract: BACKGROUND: Evidence has associated opioid use initiated early in a workers' compensation claim with subsequent disability. In 2013, the Washington State Department of Labor and Industries (DLI) implemented procedures based on new regulations that require improvement in pain and function to approve opioids beyond the acute pain period. METHODS: We measured opioid prescriptions between 6 and 12 weeks following injury, an indicator of persistent opioid use. Actuarial data for the association of any opioid use versus no opioid use with development of lost time payments are reported. RESULTS: Prior authorization with hard stops led to a sustained drop in persistent opioid use, from nearly 5% in 2013 to less than 1% in 2017. This reduction was also associated with reversal of the increased lost work time patterns seen from 1999 to 2010. CONCLUSIONS: Prior authorization targeted at preventing transition to chronic opioid use can prevent and reverse adverse time loss development that has occurred on a population basis concomitant with the opioid epidemic

Han Y, Feng Z, Zhang J, Jin R, and Aboagye-Nimo E. Employees' safety perceptions of site hazard and accident scenes. Journal of Construction Engineering and Management. 2019; 145(1):04018117.
[https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001590](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001590)

Koskela L, Ferrantelli A, Niiranen J, Pikas E, and Dave B. Epistemological explanation of lean construction. Journal of Construction Engineering and Management. 2019; 145(2):04018131.
[https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001597](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001597) [open access]

Kwok AK, O'Hara NN, Pollak AN, O'Hara LM, Herman A, Welsh CJ, et al. Are injured workers with higher rehabilitation service utilization less likely to be persistent opioid users? A cross-sectional study. BMC Health Services Research. 2019; 19(1):32.
<https://doi.org/10.1186/s12913-019-3879-6> [open access]

Abstract: BACKGROUND: Given its role in treating musculoskeletal conditions, rehabilitation medicine may be an important factor in decreasing the use of opioids among injured workers. The primary objective was to determine if increased utilization of rehabilitation services was associated with decreased persistent opioid use among workers' compensation claimants. The secondary objective was to determine the combined association of rehabilitation service utilization and persistent opioid use with days of work lost due to injury. METHODS: Using Chesapeake Employers' Insurance Company claims data from 2008 to 2016, claimants with at least one filled opioid prescription within 90 days of injury were eligible for inclusion. The primary outcome was persistent opioid use, defined as at least one filled opioid prescription more than 90 days from injury. The secondary outcome was days lost due to injury. The primary variable of interest, rehabilitation service utilization, was quantified based on the number of rehabilitation service claims and grouped into five levels (no utilization, and four quartiles - low, medium, high, very high). RESULTS: Of the 9596 claimants included, 29% were persistent opioid users. Compared to claimants

that did not utilize rehabilitation services, patients with very high rehabilitation utilization were nearly three times more likely (OR: 2.71, 95% CI: 2.28-3.23, $p < 0.001$) to be persistent opioid users and claimants with low and medium levels of rehabilitation utilization were less likely to be persistent opioid users (low OR: 0.20, 95% CI: 0.14-0.27, $p < 0.001$) (medium OR: 0.26, 95% CI: 0.21-0.32, $p < 0.001$). Compared to claimants that did not utilize rehabilitation services, very high rehabilitation utilization was associated with a 27% increase in days lost due to the injury (95% CI: 21.9-32.3, $p < 0.001$), while low (- 16.4, 95% CI: -21.3 - - 11.5, $p < 0.001$) and medium (- 11.5, 95% CI: -21.6 - -13.8, $p < 0.001$) levels of rehabilitation utilization were associated with a decrease in days lost due to injury, adjusting for persistent opioid use. CONCLUSION: Our analysis of insurance claims data revealed that low to moderate levels of rehabilitation was associated with reduced persistent opioid use and days lost to injury. Very high rehabilitation utilization was associated with increased persistent opioid use and increased time from work

Nigatu YT, Huang J, Rao S, Gillis K, Merali Z, and Wang J. Indicated prevention interventions in the workplace for depressive symptoms: a systematic review and meta-analysis. American Journal of Preventive Medicine. 2019; 56(1):e23-e33.

<https://doi.org/10.1016/j.amepre.2018.08.027> [open access]

Context Depressive symptoms are highly prevalent and cause substantive morbidities and loss of functioning among employees. Depression may be prevented at its early stages. However, there is a paucity of information regarding indicated preventive interventions for depression among employees. The objective of this review is to examine the effectiveness of indicated interventions for the reduction of depressive symptoms in the workplace. Evidence acquisition A systematic review and meta-analysis of articles published between January 2000 and September 2017 was conducted using major electronic databases, including PubMed/MEDLINE, PsycINFO, EMBASE, SOCINDEX, and ABI/ProQuest. Studies were selected based on a set of predefined inclusion criteria. Primary outcome measures were depressive symptomatology, and the interventions were preventive in nature. Studies were pooled based on the intervention type and the effect size was measured using the standardized mean difference. Evidence synthesis A computer and hand search of the literature yielded 4,462 papers, from which 16 trials were identified to be suitable for meta-analysis. Eight of 16 studies reported significant effects for workplace preventive interventions targeting depressive symptoms in which six were cognitive behavioral therapy (CBT)-based interventions and two were non-CBT-based interventions. Small to medium effect sizes were found for both CBT- and non-CBT-based interventions (standardized mean difference= -0.44, 95% CI= -0.61, -0.26, $I^2=62.1%$ and standardized mean difference= -0.32, 95% CI= -0.59, -0.06, $I^2=58%$, respectively).Conclusions This review demonstrates that indicated interventions can significantly reduce the level of depressive symptoms among workers. The implementation of evidence-based workplace interventions should

consequently be considered to prevent the development of depressive symptoms among employees.

O'Hara NN, Pollak AN, Welsh CJ, O'Hara LM, Kwok AK, Herman A, et al. Factors associated with persistent opioid use among injured workers' compensation claimants. JAMA Network Open. 2018; 1(6):e184050.

<https://doi.org/10.1001/jamanetworkopen.2018.4050> [open access]

Abstract: Importance: There is a paucity of data on persistent opioid use and factors associated with persistent opioid use among workers' compensation claimants. Objective: To determine the proportion of injured workers who filled an opioid prescription beyond 90 days from injury and the factors associated with persistent opioid use among workers' compensation claimants. Design, Setting, Participants: This retrospective cohort study collected workers' compensation claims data from January 1, 2008, to December 31, 2016, from the Chesapeake Employers' Insurance Company in Maryland. All workers' compensation claimants injured during the study years and with at least 1 filled opioid prescription were eligible for inclusion. For patients who had unique injury claims in multiple years of the study, only the first claimed injury was included in our analysis. Patients who died as a result of the claimed injury were excluded. The analysis was performed between October 2017 and August 2018. Main Outcomes and Measures: The primary outcome was persistent opioid use, defined as an opioid prescription fulfillment beyond 90 days from the date of injury. Multivariable regression was used to determine prognostic factors of persistent opioid use. Results: Of the 9596 study participants (mean [SD] age, 43 [12.3] years; 6218 [65.1%] male), 2741 (28.6%) filled an opioid prescription more than 90 days from their date of injury. Participants aged 60 years or older (odds ratio [OR], 1.92; 95% CI, 1.56-2.36), crush injuries (OR, 1.55; 95% CI, 1.28-1.89), strain and sprain injuries (OR, 1.54; 95% CI, 1.36-1.75), annual income more than \$60000 (OR, 1.31; 95% CI, 1.07-1.61), and concomitant diagnoses for chronic joint pain (OR, 1.98; 95% CI, 1.79-2.20) were significantly associated with persistent opioid use. Compared with workers with claims designated as permanent partial disability, workers with medical-only claims were significantly less likely to have persistent opioid use at 90 days postinjury (OR, 0.17; 95% CI, 0.15-0.20). Conclusions and Relevance: A high proportion of persistent opioid use was observed in this workers' compensation cohort. Interventions to lower persistent opioid use in this population should target patients with the characteristics identified in this study

Okechukwu CA, Molino J, and Soh Y. Associations between marijuana use and involuntary job loss in the United States: representative longitudinal and cross-sectional samples. Journal of Occupational & Environmental Medicine. 2019; 61(1):21-28.

<https://doi.org/10.1097/JOM.0000000000001463>

Abstract: OBJECTIVE: To investigate whether marijuana use is associated with involuntary job loss. METHODS: Multivariable survey logistic analysis of

longitudinal (2001 to 2002/2003 to 2004) and cross-sectional data (2012 to 2013) from National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). RESULTS: Marijuana use increased for all user groups with most workers who use marijuana using marijuana monthly (2.7% in 2001 to 2002 and 10.8% in 2012 to 2013). Past year marijuana users in 2001 to 2002 had higher odds of involuntary job loss in 2003 to 2004 (odds ratio [OR] 1.27; 95% confidence interval [CI] 1.13 to 1.41). Daily marijuana use is associated with higher odds of job loss in adjusted analyses using longitudinal (OR 2.18; 95%CI 1.71 to 2.77) and cross-sectional data (OR 1.40; 95%CI 1.06 to 1.86). Income significantly modifies these effects. CONCLUSIONS: Findings indicate that job loss may be an overlooked social cost of marijuana use for US workers. Future studies using an occupational health perspective are needed

Patriarca R, Di Gravio G, Costantino F, Falegnami A, and Bilotta F. An analytic framework to assess organizational resilience. Safety and Health at Work. 2018; 9(3):265-276.

<https://doi.org/10.1016/j.shaw.2017.10.005> [open access]

Abstract: Background: Resilience engineering is a paradigm for safety management that focuses on coping with complexity to achieve success, even considering several conflicting goals. Modern sociotechnical systems have to be resilient to comply with the variability of everyday activities, the tight-coupled and underspecified nature of work, and the nonlinear interactions among agents. At organizational level, resilience can be described as a combination of four cornerstones: monitoring, responding, learning, and anticipating. Methods: Starting from these four categories, this article aims at defining a semiquantitative analytic framework to measure organizational resilience in complex sociotechnical systems, combining the resilience analysis grid and the analytic hierarchy process. Results: This article presents an approach for defining resilience abilities of an organization, creating a structured domain-dependent framework to define a resilience profile at different levels of abstraction, and identifying weaknesses and strengths of the system and potential actions to increase system's adaptive capacity. An illustrative example in an anesthesia department clarifies the outcomes of the approach. Conclusion: The outcome of the resilience analysis grid, i.e., a weighed set of probing questions, can be used in different domains, as a support tool in a wider Safety-II oriented managerial action to bring safety management into the core business of the organization

Sakhakarmi S, Park J, and Cho C. Enhanced machine learning classification accuracy for scaffolding safety using increased features. Journal of Construction Engineering and Management. 2019; 145(2):04018133.

[https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001601](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001601)

Sudholz B, Salmon J, and Mussap AJ. Workplace health beliefs concerning physical activity and sedentary behaviour. Occupational Medicine. 2018;

68(9):631-634.

<https://doi.org/10.1093/occmed/kqy143> [open access]

Abstract: Background: Sedentary behaviour (SB) in the form of uninterrupted sitting constitutes a risk factor for chronic disease that is independent of the risks associated with insufficient physical activity (PA). However, little is known about employee and manager health beliefs concerning SB and PA. Aims: We assess health beliefs of desk-based workers concerning PA and SB accrued at work versus during leisure. We ask whether recreational PA attenuates the perceived ill-health effects of prolonged occupational SB, and compare attitudes of employees and managers to interventions aimed at reducing/interrupting workplace sitting. Methods: Two hundred and twenty-two desk-based employees and 121 managers located in Melbourne, Australia, rated the healthiness of vignettes describing combinations of uninterrupted sitting, sitting with breaks, light PA and moderate-to-vigorous PA accumulated at work and during leisure time. Participants also responded to open-ended questions concerning the implications of reducing workplace sitting. Results: Mixed-model ANOVA revealed that the presence of leisure-time PA greatly diminished the perceived detrimental effects to health of workplace sitting. Subsequent thematic analysis of qualitative data further revealed that participants' concerns with SB were primarily musculoskeletal and workplace performance rather than chronic health. Conclusions: Employees and their managers do not rate uninterrupted sitting as being unhealthy when it is presented to them in the form of an 'active couch potato' lifestyle (a person who meets minimum PA recommendations but spends much of their work time and non-PA time sitting). We recommend that interventions targeting workplace SB take into account the contextual nature of health beliefs