

IWH Research Alert
July 19, 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.

***Lane TJ, Lilley R, Black O, Sim MR, and Smith PM. Health care provider communication and the duration of time loss among injured workers: a prospective cohort study. *Medical Care*. 2019; [epub ahead of print].**

<https://doi.org/10.1097/MLR.0000000000001160>

Abstract: BACKGROUND: In addition to providing injured workers with biomedical treatment, health care providers (HCPs) can promote return to work (RTW) through various communications.

OBJECTIVES: To test the effect of several types of HCP communications on time loss following injury. **RESEARCH DESIGN:** The authors analyzed survey and administrative claims data from a total of 730 injured workers in Victoria, Australia. Survey responses were collected around 5 months postinjury and provided data on HCP communication and confounders. Administrative claim records provided data on compensated time loss postsurvey. The authors conducted multivariate zero-inflated Poisson regressions to determine both the odds of having future time loss and its duration.

MEASURES: Types of HCP communications included providing an estimated RTW date, discussing types of activities the injured worker could do or ways to prevent a recurrence, and contacting other RTW stakeholders. Each was measured in isolation as well as modified by a low-stress experience with the HCP. Time loss was the count of

cumulative compensated work absence in weeks, accrued postsurvey. RESULTS: RTW dates reduced the odds of future time loss [odds ratio, 0.26; 95% confidence interval (CI), 0.09-0.82] regardless of the stressfulness of the experience. Communications that predicted shorter durations of time loss only did so with low-stress experiences: RTW date [incidence rate ratio (IRR), 0.56; 95% CI, 0.50-0.63], stakeholder contact (IRR, 0.78; 95% CI, 0.70-0.87), and prevention discussions (IRR, 0.87; 95% CI, 0.78-0.98). CONCLUSIONS: HCPs may reduce time loss through several types of communication, particularly when stress is minimized. RTW dates had the largest and most robust effect

***Orchard C, Carnide N, and Smith P. How does perceived fairness in the workers' compensation claims process affect mental health following a workplace injury? Journal of Occupational Rehabilitation. 2019; [epub ahead of print].**

<https://doi.org/10.1007/s10926-019-09844-3>

Abstract: Purpose Mental health concerns are common after a workplace injury, particularly amongst those making a compensation claim. Yet there is a lack of research exploring the effect of modifiable elements of the return-to-work process on mental health. The aim of this study is to examine the impact of perceived injustice in the interactions between claim agents and claimants on mental health symptoms in the 12-month following a musculoskeletal (MSK) workplace injury. Methods A cohort of 585 workers compensation claimants in Victoria, Australia were interviewed three times over a 12-month period following a workplace MSK injury. Perceptions of informational and interpersonal justice in claim agent interactions were measured at baseline, and the Kessler Psychological Distress (K6) scale was administered as a measure of mental health at all three timepoints. Path analyses were performed to examine the direct and indirect effects of perceived justice at baseline on concurrent and future mental health, after accounting for confounding variables. Results Each 1-unit increase in perceptions of informational and interpersonal justice, indicating poorer experiences, was associated with an absolute increase of 0.16 and 0.18 in respective K6 mental health score at baseline, indicating poorer mental health on a 5-point scale. In addition, perceived justice indirectly impacted mental health at 6-month and 12-month, through sustained negative impact from

baseline as well as increased risk of disagreements between the claim agent and claimant. Conclusions This finding has highlighted the importance of perceived justice in claim agent interactions with claimants in relation to mental health following a work-related MSK injury

Al-Bsheish M, bin Mustafa M, Ismail M, Jarrar M, Meri A, and Dauwed M. Perceived management commitment and psychological empowerment: a study of intensive care unit nurses' safety. Safety Science. 2019; 118:632-640.

<https://doi.org/10.1016/j.ssci.2019.05.055>

Anderson J, Granat MH, Williams AE, and Nester C. Exploring occupational standing activities using accelerometer-based activity monitoring. Ergonomics. 2019; 62(8):1055-1065.

<https://doi.org/10.1080/00140139.2019.1615640>

Abstract: Prolonged standing at work is required by an estimated 60% of the employed population and is associated with a high prevalence of musculoskeletal disorders. 'Standing' is expected to encompass a range of activities of varying intensity. This study aimed to define a range of 'standing' work-based activities; and objectively explore differences between 'standing' occupations. The following movements were defined using a triaxial accelerometer (ActivPAL) through recordings of known movements (n = 11): static standing, weight-shifting, shuffling, walking and sitting. Movements over a working day were defined for chefs (n = 10), veterinary surgeons (n = 7) and office workers (n = 9). Despite veterinary surgeons and chefs spending a similar time in an upright posture, veterinary surgeons spent 62% of this time standing statically whereas chefs split their time between all the movements. Overall, this study provides the first attempt to define 'standing' activities, allowing the differentiation of activities between occupations spending similar periods of time upright. Practitioner Summary: This study identified a range of work-based 'standing' activities of varying intensity. Differences in activity were recorded between two occupations spending a similar time in an upright posture (veterinary surgeons and chefs). A broader definition of standing activities could be important when considering factors related to musculoskeletal disorders at work

Dragioti E, Bjork M, Larsson B, and Gerdle B. A meta-epidemiological appraisal of the effects of interdisciplinary multimodal pain therapy dosing for chronic low back pain. Journal of Clinical Medicine. 2019; 8:E871.

<https://doi.org/10.3390/jcm8060871> [open access]

Abstract: Using a meta-analysis, meta-regression, and a meta-epidemiological approach, we conducted a systematic review to examine the influence of interdisciplinary multimodal pain therapy (IMPT) dosage on pain, disability, return to work, quality of life, depression, and anxiety in published randomised controlled trials (RCTs) in patients with non-specific chronic low back pain (CLBP). We considered all RCTs of IMPT from a Cochrane review and searched PubMed for additional RCTs through 30 September 2018. A subgroup random-effects meta-analysis by length, contact, and intensity of treatment was performed followed by a meta-regression analysis. Using random and fixed-effect models and a summary relative odds ratio (ROR), we compared the effect sizes (ES) from short-length, non-daily contact, and low-intensity RCTs with long-length, daily contact, and high-intensity RCTs. Heterogeneity was quantified with the I(2) metric. A total of 47 RCTs were selected. Subgroup meta-analysis showed that there were larger ES for pain and disability in RCTs with long-length, non-daily contact, and low intensity of treatment. Larger ES were also observed for quality of life in RCTs with short-length, non-daily contact, and low intensity treatment. However, these findings were not confirmed by the meta-regression analysis. Likewise, the summary RORs were not significant, indicating that the length, contact, and intensity of treatment did not have an overall effect on the investigated outcomes. For the outcomes investigated here, IMPT dosage is not generally associated with better ES, and an optimal dosage was not determined

Hudson D and Ramsay JD. A roadmap to professionalism: advancing occupational safety and health practice as a profession in the United States. Safety Science. 2019; 118:168-180.

<https://doi.org/10.1016/j.ssci.2019.04.018>

Klug K, Bernhard-Oettel C, Makikangas A, Kinnunen U, and Sverke M. Development of perceived job insecurity among young workers: a latent class growth analysis. International Archives of Occupational & Environmental Health. 2019; 92(6):901-918.

<https://doi.org/10.1007/s00420-019-01429-0>

Abstract: PURPOSE: Individual differences in the development of perceived job insecurity among young workers may be influenced by characteristics of the first job (contract type and sector) and individual background (education and previous unemployment), and can have implications for subsequent health and well-being. The aim of this study was to investigate the development of perceived job insecurity during the early career, as well as associations between different patterns of development (i.e., trajectories), predictors and outcomes. METHODS: We conducted a latent class growth analysis to identify trajectories of perceived job insecurity and investigated their respective associations with predictors and outcomes across 6 years in a sample of 1711 German labor market entrants. RESULTS: Six trajectories were identified: three showed stable job insecurity perceptions (stable moderate, 36%; stable low, 32%; stable high, 5%), two showed decrease (moderate to low, 12%; high to moderate, 3%), and one showed increasing job insecurity perceptions (low to moderate, 13%). Temporary contracts and previous unemployment predicted trajectories characterized by increasing, higher initial or higher overall levels of perceived job insecurity. In contrast, public sector employees and university graduates were less likely to experience persisting or increasing job insecurity. The trajectories differed in their overall levels of self-rated health and job satisfaction, but not with respect to change in these outcomes. Instead, increasing perceived job insecurity was associated with decreasing life satisfaction. CONCLUSIONS: The findings suggest that an insecure career start and individual risk factors may predispose young workers to an unfavorable development of both job insecurity perceptions and levels of well-being

Konradt U, Heblich F, Krysz S, Garbers Y, and Otte KP. Beneficial, adverse, and spiraling health-promotion effects: evidence from a longitudinal randomized controlled trial of working at sit-stand desks. Journal of Occupational Health Psychology. 2019; [epub

ahead of print].

<https://doi.org/10.1037/ocp0000161>

Abstract: In a 6-month longitudinal randomized field experiment, we examined how using height-adjustable sit-stand desks could have beneficial, adverse, and spiraling effects on people's musculoskeletal and psychovegetative complaints, and on positive (vitality and vigilance) and negative psychological symptoms, namely, stressor uncontrollability (i.e., perceived uncontrollability of workload), psychological tension, and mental tiredness. A total of 127 employees in various, mostly sedentary, occupations were randomly assigned to either the intervention or the control group. Variables were assessed monthly for 6 months on a self-reported basis. Bayesian structural equation modeling showed that the intervention produced large inhibiting between-subjects effects for musculoskeletal problems in the neck, back, and shoulders (beta ranged between $-.26$ and $-.21$). Within-subject analyses revealed that the intervention produced large inhibiting effect sizes for intensity ($g = 3.06$) and prevalence of musculoskeletal ($g = 1.19$) and psychovegetative complaints (g between 0.76 and 1.57). For negative psychological symptoms (i.e., psychological tension and mental tiredness), participants in the intervention group showed a steeper decrease than participants in the control group (g between 2.34 and 3.74). For positive indicators (i.e., vitality and vigilance), the intervention produced large promoting effects for participants in the intervention group compared with participants in the control group (g between 0.70 and 1.65). There was no change in stressor uncontrollability between the two groups. Finally, findings suggest that sit-stand desks can be effective in improving occupational health by weakening a downward-spiraling effect. (PsycINFO Database Record (c) 2019 APA, all rights reserved)

Krebs MO, Kebir O, and Jay TM. Exposure to cannabinoids can lead to persistent cognitive and psychiatric disorders. *European Journal of Pain*. 2019; 23(7):1225-1233.

<https://doi.org/10.1002/ejp.1377>

Abstract: BACKGROUND: Cannabinoids are proposed in a wide array of medical indications. Yet, the evaluation of adverse effects in controlled clinical studies, following the evidence-based model, has partly been bypassed. On the other hand, studies on the

consequences of recreational use of cannabis and experimental studies bring some insights on the potential long-term consequences of cannabinoids use. RESULTS: Epidemiological studies have consistently demonstrated that cannabis use is associated with a risk of persistent cognitive deficits and increased risk of schizophrenia-like psychoses. These risks are modulated by the dose and duration of use, on top of age of use and genetic factors, including partially shared genetic predisposition with schizophrenia. Experimental studies in healthy humans showed that cannabis and its principal psychoactive component, the delta-9-tetrahydrocannabinol (THC), could produce transient, dose-dependent, psychotic symptoms as well as cognitive effects, which can be attenuated by cannabidiol (CBD). Studies in rodents have confirmed these effects and shown that adolescent exposure results in structural changes and impaired synaptic plasticity, impacting fronto-limbic systems that are critically involved in higher brain functions. The endocannabinoid system plays an important role in brain maturation. Its over-activation by cannabinoid receptor type 1 agonists (e.g., THC) during adolescence and the resulting changes in neuroplasticity could alter brain maturation and cause long-lasting changes that persist in the adult brain. CONCLUSIONS: Exposure to cannabinoids can have long-term impact on the brain, with an inter-individual variability that could be conveyed by personal and family history of psychiatric disorders and genetic background. Adolescence and early adulthood are critical periods of vulnerability. SIGNIFICANCE: The assessment of beneficence-risk balance of medical use of cannabis and cannabinoids needs to carefully explore populations that could be more at-risk of psychiatric and cognitive complications

Mixer S, Mathiassen SE, and Hallman D. Alternations between physical and cognitive tasks in repetitive work: effect of cognitive task difficulty on fatigue development in women. *Ergonomics*. 2019; 62(8):1008-1022.

<https://doi.org/10.1080/00140139.2019.1614229>

Abstract: In a context of job rotation, this study determined the extent to which the difficulty of a cognitive task (CT) interspersed between bouts of repetitive, low-intensity work (pipetting) influences recovery from fatigue. Fifteen participants performed three experimental sessions, each comprising 10 repeats of a 7 min + 3 min combination

of pipetting and CT. The CT was easy, moderate or hard. Surface electromyography (EMG amplitude of the forearm extensor and trapezius muscles) and self-reports was used to assess fatigability. Perceived fatigue and trapezius EMG amplitude increased during sessions. CT difficulty influenced fatigue development only little, besides forearm extensor EMG increasing more in CT3 than in CT1 and CT2. During CT bouts, fatigability recovered, and to a similar extent irrespective of CT. Thus, CT difficulty influenced recovery of perceived as well as performance fatigability to a minor extent, and may not be a critical issue in job rotation comprising alternating physical and cognitive tasks. Practitioner summary: Alternations between physical and cognitive tasks may be an attractive option for job rotation. In this study on women, we show that the difficulty of the cognitive task influences recovery from fatigue only little and we conclude that cognitive difficulty, within reasonable limits, may be a minor issue in job rotation

Pihl-Thingvad J, Elklit A, Brandt LPA, and Andersen LL. Workplace violence and development of burnout symptoms: a prospective cohort study on 1823 social educators. International Archives of Occupational & Environmental Health. 2019; 92(6):843-853.

<https://doi.org/10.1007/s00420-019-01424-5>

Abstract: PURPOSE: Burnout and workplace violence (WPV) have been associated in cross-sectional studies, but longitudinal studies with solid methods and adequate sample sizes are lacking. This study investigates whether WPV increases burnout symptoms during a 12-month period. METHODS: Questionnaire data were collected on 1823 social educators at baseline and 12-month follow-up, coupled with additionally 12 monthly text-message surveys on exposure to WPV. Using general linear modelling for repeated measures, we estimated change over time in burnout symptoms in three WPV exposure groups (none, low, high). RESULTS: A time by exposure to WPV interaction existed for development of burnout; $F(2) = 7.2$, $p = 0.001$ $\eta^2(2) = 0.011$. Burnout increased significantly within the group of low exposure; $F(1) = 6.8$, $p = 0.01$ and high exposure; $F(1) = 6.7$ $p = 0.001$, but not within the non-exposed $F(1) = 2.1$ $p = 0.15$. At follow-up, both the low exposed and high exposed had significantly higher levels of burnout compared to the non-exposed. CONCLUSION:

Exposure to WPV increases level of burnout within a 12-month period. We propose that assessment of burnout in future studies should utilize instruments capable of detecting small changes. We further propose that prevention against employee burnout could be improved using monitoring targeted at employees exposed to WPV

Senthanar S, MacEachen E, and Lippel K. Return to work and ripple effects on family of precariously employed injured workers. *Journal of Occupational Rehabilitation*. 2019; [epub ahead of print].

<https://doi.org/10.1007/s10926-019-09847-0>

Abstract: Purpose Work injury and return to work processes can have adverse effects on injured workers and their families. Family members may experience increased workloads, role reversals, dissolution of marriages or changes in relationships with children, as well as financial strain from loss of income. How these associations interact when the injured worker is precariously employed, however, is unknown. The aim of this study was to explore the impacts of work-related injury or illness as well as subsequent compensation and return to work processes on families and relationships of precariously employed workers. Methods Interviews were conducted with fifteen precariously employed injured workers recruited through on-line advertising, injured worker groups, and social media platforms in Ontario. Situational analysis was used to identify how family members were affected and their role throughout the injury process. Results Precariously employed injured workers felt caught between self-interested employers and disinterested workers' compensation. In some cases, this led to deteriorated mental health and well-being. The worker's difficulties with RTW challenged financial security of families and affected their day-to-day normal routines. While some workers received emotional and instrumental support from their family members, others had their families fall apart when chronic disability and unemployment proved to be too much. Conclusions This study addressed the complex ways that work injury and illness among precariously employed workers interact with family life and relationships. Findings illustrate how the income and employment insecurity associated with precarious employment has ripple effects on workers and their families when they become injured

Sidhu S and An G. Occupational health internship program at a metropolitan transit authority: exploring split shifts as a health and safety concern for bus operators. *New Solutions*. 2019; 29(2):266-283.

<https://doi.org/10.1177/1048291119853306>

Tsuno K, Kawachi I, Inoue A, Nakai S, Tanigaki T, Nagatomi H, et al. Long working hours and depressive symptoms: moderating effects of gender, socioeconomic status, and job resources. *International Archives of Occupational & Environmental Health*. 2019; 92(5):661-672.

<https://doi.org/10.1007/s00420-019-01401-y>

Abstract: PURPOSE: Systematic reviews and meta-analyses have found inconsistent associations between working hours and depressive symptoms. The purpose of this study was to investigate the possible moderators of this association, using data from a large-scale cross-sectional survey. METHODS: A total of 16,136 Japanese employees (men 83.5%; women 16.5%) responded to a self-administered questionnaire inquiring about overtime working hours during the previous month and depressive symptoms (Center for Epidemiologic Studies Depression scale), as well as moderating factors including gender, age, marital status, socioeconomic status, commuting time, sleeping hours per day, job control and worksite social support (Job Content Questionnaire), neuroticism (Eysenck's Personality Questionnaire Revised), and social desirability (Social Desirability Scale) (response rate, 85%). We conducted sequential regression analyses to investigate the main effects and interaction effects of all moderating variables. RESULTS: The association between overtime working hours and depressive symptoms was significantly moderated by gender (interaction effect: $\beta = 0.03$), age ($\beta = -0.02$), manager ($\beta = 0.03$), sleeping hours ($\beta = -0.02$), job control ($\beta = -0.03$), and neuroticism ($\beta = 0.02$). Among workers engaged in 80 + hours of overtime, higher depressive symptoms were reported by women, younger employees, non-managers, employees with low job control, low worksite social support, and high neuroticism. A significant main effect of long overtime working hours on depressive symptoms was also observed even after controlling for all independent variables ($\beta = 0.02$). CONCLUSIONS: Long overtime working hours is associated with

depressive symptoms. We also found significant heterogeneity in the association according to employee characteristics, which may explain the inconsistent findings in previous literature

Zhao Y, Richardson A, Poyser C, Butterworth P, Strazdins L, and Leach LS. Shift work and mental health: a systematic review and meta-analysis. International Archives of Occupational & Environmental Health. 2019; 92(6):763-793.

<https://doi.org/10.1007/s00420-019-01434-3>

Abstract: **BACKGROUND:** Shift work is common. However, research findings are mixed regarding the impact of shift work on mental health. This systematic review sought to provide a comprehensive summary of existing research examining the association between different types of shift work and mental health. The review included large-scale, non-occupation-specific research. **METHODS:** Four electronic databases PubMed, PsycINFO, Web of Science and SCOPUS were searched to identify studies that reported on the statistical association between shift work and mental health and that used population-based samples. Two reviewers extracted information about study characteristics and data on the association between shift work and mental health. A meta-analysis was performed for longitudinal studies adopting a 'broad binary' measure of shift work. **RESULTS:** Thirty-three studies were included in the final review-10 cross-sectional studies, 22 longitudinal studies, and 1 study that included both. Findings were grouped based on whether the measure of shift work focussed on: (1) night/evening work, (2) weekend work, (3) irregular/unpredictable work schedule, or (4) a broad binary measure. There was a reasonable level of evidence that overall, when a broad binary measure was adopted, shift work was associated with poorer mental health-this finding was supported by the meta-analysis results. There was also some evidence that irregular/unpredictable work was associated with poorer mental health. There was less evidence for night/evening and minimal evidence for weekend work. Inconsistencies in study methodology, limited contrasting and combining the results. **CONCLUSIONS:** The association between shift work and mental health is different across types of shift work. The evidence is strongest for a broad binary, general measure of shift work and for irregular or unpredictable shift

work. There is a need for continued research that adopts consistent and clear measures of shift work

*IWH authored publications.