

**IWH Research Alert**  
**May 10, 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.

**\*Nolet PS, Emary PC, Kristman VL, Murnaghan K, Zeegers MP, and Freeman MD. Exposure to a motor vehicle collision and the risk of future neck pain: a systematic review and meta-analysis. *Physical Medicine & Rehabilitation*. 2019; [epub ahead of print].**

<http://doi.org/10.1002/pmrj.12173>

Abstract: OBJECTIVE: To summarize the literature that has examined the association between a motor vehicle collision (MVC) related neck injury and future neck pain (NP) in comparison with the population that has not been exposed to neck injury from an MVC. LITERATURE SURVEY: Neck injury resulting from a MVC is associated with a high rate of chronicity. Prognosis studies indicate 50% of injured continue to experience NP a year after the collision. This is difficult to interpret due to the high prevalence of NP in the general population. METHODOLOGY: We performed a systematic review of the literature using five electronic databases, searching for risk studies on exposure to a MVC and future NP published from 1998 to 2018. The outcome of interest was future NP. Eligible risk studies were critically appraised using the modified Quality in Prognosis Studies (QUIPS) instrument. The results were summarized using best-evidence synthesis principles, a random effects meta-analysis, meta-regression and testing for publication bias was performed with the pooled data. SYNTHESIS: Eight articles were identified of which seven were of lower risk of bias. Six studies reported a positive association between a neck injury in an MVC and future NP compared to those without a neck injury in a MVC. Pooled analysis of the six studies indicated an unadjusted relative risk of future NP in the MVC exposed population with neck injury of 2.3 (95% CI [1.8, 3.1]), which equates to a 57% attributable risk under the exposed. In two studies where

exposed subjects were either not injured or injury status was unknown, there was no increased risk of future NP. CONCLUSIONS: There was a consistent positive association among studies that have examined the association between MVC-related neck injury and future NP. These findings are of potential interest to clinicians, insurers, patients, governmental agencies, and the courts

**Anusiewicz CV, Shirey MR, and Patrician PA. Workplace Bullying and Newly Licensed Registered Nurses: An Evolutionary Concept Analysis. Workplace Health & Safety. 2019; 67(5):250-261.**

<http://doi.org/10.1177/2165079919827046>

Abstract: Workplace bullying (WPB) among nurses, especially newly licensed registered nurses (NLRNs), negatively affects nurse, patient, and organizational outcomes. Despite empirical evidence addressing the prevalence and impact of WPB, the behavior continues to persist within nursing work environments. Increased conceptual clarity of WPB is needed for interventions to be developed, executed, and evaluated. The purposes of this concept analysis, in which we used Rodgers' evolutionary method, were to obtain a clearer understanding of WPB, to differentiate the concept from other forms of workplace violence, and to describe a definition of WPB consistently used in the literature. Three attributes specific to WPB included negative behaviors directed toward an individual who perceives themselves to be a target, a time frame of experiencing these negative behaviors (e.g., daily or weekly) for a prolonged period (e.g., several weeks), and the inclusion of a power gradient or hierarchy between the bully and target. Antecedents identified for WPB included a scarcity of resources and poor leadership and management. Consequences associated with WPB included adverse nurse, patient, and health care organizational outcomes. WPB was conceptually defined as any negative behavior, exhibited by a nurse of either perceived or actual power, that was repeatedly (i.e., daily or weekly) and persistently directed toward NLRNs who have difficulty defending themselves against the behavior. Implications for researchers, health care organizations, nurse leaders, and nurses are included

**Aronsson V, Toivanen S, Leineweber C, and Nyberg A. Can a poor psychosocial work environment and insufficient organizational resources explain the higher risk of ill-health and sickness absence in human service occupations? Evidence from a Swedish national cohort. Scandinavian Journal of Public Health. 2019; 47(3):310-317.**

<http://doi.org/10.1177/1403494818812638>

Abstract: AIM: The aim of this study was to investigate differences in burnout, self-rated health (SRH) and sickness absence between human service occupations (HSOs) and other occupations, and whether they can be attributed to differences in psychosocial work environment and organizational resources. METHODS: Data were derived from the Swedish Longitudinal Occupational Survey of Health, an approximately representative sample of the Swedish working population ( n = 4408). Employment in HSOs, psychosocial work

environment and organizational resources in 2012 predicted relative risks of sickness absence, burnout and suboptimal SRH in 2014 using modified Poisson regressions. The psychosocial work factors' and organizational resource variables' relative importance were estimated by adding them to the models one by one, and with population attributable fractions (PAFs). RESULTS: Employment in HSOs was associated with a higher risk of sickness absence and the risk was explained by psychosocial and organizational factors, particularly high emotional demands, low work-time control and exposure to workplace violence. Employment in HSOs was not associated with burnout after sociodemographic factors were adjusted for, and furthermore not with SRH. A lower risk of suboptimal SRH was found in HSOs than in other occupations with equivalent psychosocial work environment and organizational resources. PAFs indicated that psychosocial work environment and organizational resource improvements could lead to morbidity reductions for all outcomes; emotional demands were more important in HSOs. CONCLUSIONS: HSOs had higher risks of sickness absence and burnout than other occupations. The most important work factors to address were high emotional demands, low work-time control, and exposure to workplace violence

**Bradley C, Brennan J, and Wagner B. Workplace injury rates and firm-level turnover in Montana's oil and gas industry. American Journal of Industrial Medicine. 2019; [epub ahead of print].**

<http://doi.org/10.1002/ajim.22983>

Abstract: BACKGROUND: Do workers follow their self-interest by minimizing injury risk in their employment decision? If so, employers could use injury reduction as a recruitment and retention strategy. This study explores whether injury incidence is associated with turnover in Montana's Oil and Gas industry. METHODS: A panel data set of Unemployment Insurance and Workers' Compensation administrative records from 2010 to 2015 was used to model the relationship between turnover and injury claim rates at the firm level. RESULTS: Total turnover and injury rates were found to be positively related while injury rates and separation rates had no such association. Quarters in which the employer experienced a severe injury had a 3.3 percentage point increase in separation rates. DISCUSSION: The findings suggest that injured workers contribute to increased turnover, but coworker turnover does not increase with increased injury rates in the firm. Secondary findings suggest a relationship between recent hires and increased injury rates, although further investigation is required

**Douglas T and Van den Borre L. Asbestos neglect: why asbestos exposure deserves greater policy attention. Health Policy. 2019; 123(5):516-519.**

<http://doi.org/10.1016/j.healthpol.2019.02.001>

Abstract: While many public health threats are now widely appreciated by the public, the risks from asbestos exposure remain poorly understood, even in high-risk groups. This article makes the case that asbestos exposure is an important,

ongoing global health threat, and argues for greater policy efforts to raise awareness of this threat. It also proposes the extension of asbestos bans to developing countries and increased public subsidies for asbestos testing and abatement

**Felknor SA, Schulte PA, Schnorr TM, Pana-Cryan R, and Howard J. Burden, need and impact: an evidence-based method to identify worker safety and health research priorities. *Annals of Work Exposures and Health*. 2019; 63(4):375-385.**

<http://doi.org/10.1093/annweh/wxz011>

Abstract: The importance of research and recommendations to address workforce safety and health derives from the continuing toll from worker fatalities, injuries, and illnesses. Estimates of the societal cost of work-related fatalities, injuries, and illnesses range up to \$2.2 trillion in the USA from 2007 to 2015, which may be an underestimate of total societal costs. The ongoing changes in the nature of work, the workforce, and the workplace in the USA challenge old paradigms of worker safety and health research and require new decision criteria that are more solution oriented than observational and that result in interventions that can be readily applied to new occupational hazards and exposures. As public funding for science research programs becomes more constrained, and the demand for increased accountability of government spending grows, the need to demonstrate the impact or return on taxpayers' investment becomes a necessity for research agencies. The National Institute for Occupational Safety and Health has developed an evidence-based method that uses the criteria of 'burden', 'need', and 'impact' to identify research priorities and aid in the evaluation of the taxpayers' investment in research. This approach, named the BNI method, may be useful to other public and private sector research agencies or entities that need a systematic way to set research priorities and allocate increasingly scarce resources for research while ensuring the maximal return on investment

**Gemes K, Frumento P, Almondo G, Bottai M, Holm J, Alexanderson K, et al. A prediction model for duration of sickness absence due to stress-related disorders. *Journal of Affective Disorders*. 2019; 250:9-15.**

<http://doi.org/10.1016/j.jad.2019.01.045>

Abstract: BACKGROUND: Stress-related disorders are leading causes of long-term sickness absence (SA) and there is a great need for decision support tools to identify patients with a high risk for long-term SA due to them. AIMS: To develop a clinically implementable prediction model for the duration of SA due to stress-related disorders. METHODS: All new SA spells with F43 diagnosis code lasting >14 days and initiated between 2010-01-01 and 2012-06-30 were identified through data from the Social Insurance Agency. Information on baseline predictors was linked on individual level from other nationwide registers. Piecewise-constant hazard regression was used to predict the duration of the SA. Split-sample validation was used to develop and validate the model, and c-

statistics and calibration plots to evaluate it. RESULTS: Overall 83,443 SA spells, belonging to 77,173 individuals were identified. The median SA duration was 55 days (10% were >365 days). Age, sex, geographical region, employment status, educational level, extent of SA at start and SA days, outpatient healthcare visits, and multi-morbidity in the preceding 365 days were selected to the final model. The model was well calibrated. The overall c-statistics was 0.54 (95% confidence intervals: 0.53-0.54) and 0.70 (95% confidence intervals: 0.69-0.71) for predicting SA spells >365 days. LIMITATIONS: The heterogeneity of the F43-diagnosis and the exclusive use of register-based predictors limited our possibility to increase the discriminatory accuracy of the prediction. CONCLUSION: The final model could be implementable in clinical settings to predict duration of SA due to stress-related disorders and could satisfyingly discriminate long-term SA

**Hammerich A, Whitman J, Mintken P, Denninger T, Akuthota V, Sawyer EE, et al. Effectiveness of physical therapy combined with epidural steroid injection for individuals with lumbar spinal stenosis: a randomized parallel-group trial. Archives of Physical Medicine and Rehabilitation. 2019; 100(5):797-810.**

<http://doi.org/10.1016/j.apmr.2018.12.035>

Abstract: OBJECTIVE: To examine the effectiveness of epidural steroid injection (ESI) and back education with and without physical therapy (PT) in individuals with lumbar spinal stenosis (LSS). DESIGN: Randomized clinical trial. SETTING: Orthopedic spine clinics. PARTICIPANTS: A total of 390 individuals were screened with 60 eligible and randomly selected to receive ESI and education with or without PT (N=54). INTERVENTIONS: A total of 54 individuals received 1-3 injections and education in a 10-week intervention period, with 31 receiving injections and education only (ESI) and 23 additionally receiving 8-10 sessions of multimodal PT (ESI+PT). MAIN OUTCOME MEASURES: Disability, pain, quality of life, and global rating of change were collected at 10 weeks, 6 months, and 1 year and analyzed using linear mixed model analysis. RESULTS: No significant difference was found between ESI and ESI+PT in the Oswestry Disability Index at any time point, although the sample had significant improvements at 10 weeks ( $P<.001$ ; 95% confidence interval [CI], -18.01 to -5.51) and 1 year ( $P=.01$ ; 95% CI, -14.57 to -2.03) above minimal clinically important difference. Significant differences in the RAND 36-Item Short Form Health Survey 1.0 were found for ESI+PT at 10 weeks with higher emotional role function ( $P=.03$ ; 95% CI, -49.05 to -8.01), emotional well-being ( $P=.02$ ; 95% CI, -19.52 to -2.99), and general health perception ( $P=.05$ ; 95% CI, -17.20 to -.78). CONCLUSIONS: Epidural steroid injection plus PT was not superior to ESI alone for reducing disability in individuals with LSS. Significant benefit was found for the addition of PT related to quality of life factors of emotional function, emotional well-being, and perception of general health

**Ishimoto Y, Cooper C, Ntani G, Yamada H, Hashizume H, Nagata K, et al. Factory and construction work is associated with an increased risk of**



**severe lumbar spinal stenosis on MRI: A case control analysis within the wakayama spine study. American Journal of Industrial Medicine. 2019; 62(5):430-438.**

<http://doi.org/10.1002/ajim.22957>

Abstract: BACKGROUND: To explore the association of MRI-diagnosed severe lumbar spinal stenosis with occupation. METHODS: Occupational data were collected by questionnaire and all participants underwent spine MRI scans using the same protocol. Central lumbar spinal stenosis (LSS) was graded qualitatively. Those with severe LSS (>two-thirds narrowing) were compared with the controls with lesser degrees of stenosis or no stenosis. RESULTS: Data were available for 722 subjects, mean age 70.1 years. 239 (33%) cases with severe LSS were identified. Factory/construction workers had an almost four-fold increased risk of severe LSS after adjustment for age, sex, smoking, and walking speed amongst those aged <75 years (OR 3.97, 95%CI 1.46-10.85). Severe LSS was also associated with squatting  $\geq 1$  h/day (OR 1.76, 95%CI 1.01-3.07) but this association became non-significant after adjustment. CONCLUSION: Further research is needed but this study adds more evidence that occupational factors are associated with an increased risk and/or severity of degenerative disease of the lumbar spine

**Keifer M, Sammen J, Hoare L, and Harrington M. At work in the woods: occupational hazards of harvesting non-timber forest products in the Pacific Northwest. Journal of Agromedicine. 2019; 24(2):125-128.**

<http://doi.org/10.1080/1059924X.2019.1578140>

Abstract: Harvesting timber for lumber produces is among the most dangerous occupations in the United States. While not exhaustive, the literature on these dangers is substantial. However, several other smaller harvesting forest based industries put workers at risk in unique ways. Relatively little research has been published on these activities, but preliminary exploratory research, summarized here, suggests that besides the risks inherent in being in the forest, workers face some unique workplace risks, the frequency and consequences of which are augmented by the social determinants that characterize the workforce. This paper provides a brief overview of the workplace safety risks to forest green and mushroom harvesters and cedar block cutters in the Northwest. We also point out the social characteristics of these workforces that potentially aggravate these risks and the health impacts therefrom

**Moeini B, Ezati E, Barati M, Rezapur-Shahkolai F, Mohammad Gholi MN, and Afshari M. Skin cancer preventive behaviors in Iranian farmers: applying protection motivation theory. Workplace Health & Safety. 2019; 67(5):231-240.**

<http://doi.org/10.1177/2165079918796850>

Abstract: Farmers are among the most common work groups at risk of skin cancer. The protection motivation theory has been widely accepted as a framework for predicting health related behaviors. This study was conducted to

determine the role of factors preventing skin cancer among farmers in Eslamabad-e Gharb district, Iran, using the protection motivation theory. In this descriptive study, 280 farmers living in this district were studied from May to June 2017. Using cluster random sampling methods, health houses where farmers received health care were selected. Each farmer within the selected health house was then enrolled into the study using simple random sampling. Data were collected by interview using an author-developed questionnaire. The questionnaire ascertained demographic information and constructs of the protection motivation theory. Almost half of the farmers had a history of sunburn (56.4%). With regard to prevention, a small proportion reported using sunscreen (8.6%), hats (3.2%), gloves 3.9%, sunglasses 4.6%, and protective clothing 15.4%. The results of regression analyses showed that with one unit of increase in the scores of self-efficacy to adopt prevention behavior and perceived protection motivation resulted in an increase in the mean score of the "protective" behavior by 0.26 and 0.20, respectively. Working conditions among farmers place them at great risk and skin cancer prevention is essential. Intervention and prevention programs should fully identify the determinants of skin cancer prevention in farmers; in addition, the identified effective factors must be taken into account when designing and implementing appropriate interventions

**Ojala S and Pyoria P. Precarious work and the risk of receiving a disability pension. *Scandinavian Journal of Public Health*. 2019; 47(3):293-300.**

<http://doi.org/10.1177/1403494818804106>

Abstract: AIMS: Precarious employment is an emerging determinant of occupational health, but its association with work-related disability remains little understood. We operationalised precarious work as a multidimensional construct and examined how the accumulation of precarious job features predicts the incidence of receiving a disability pension (DP). METHODS: The study comprised 13,228 employees aged 20-54 who had been interviewed for the Finnish Quality of Work Life Surveys in 1984, 1990, 1997, or 2003. We measured precarious work with five variables that reflect both subjective and objective job insecurity: the threat of dismissal/unemployment; poor employability; low earnings; previous unemployment; and temporary contract. An eight-year follow-up was merged with the pooled cross-sectional data, and Cox proportional hazard ratios (HR) for receiving a DP were compared between the insecurity measures, controlling for sociodemographic covariates, job characteristics and health at the baseline with a step-wise procedure. RESULTS: Precarious employees had an elevated risk of receiving a DP (all covariates adjusted for). The risk of receiving a DP was associated with subjective job insecurity, with the strongest indicator being poor employability. The association between the threat of unemployment and receiving a DP was weak before controlling for health. Among objective insecurity measures, low earnings and earlier unemployment were weakly connected to receiving a DP before controlling for sociodemographic covariates, job characteristics and health. CONCLUSIONS: We recommend the evaluation of several precarious job features in future

studies. The risk of receiving a DP could potentially be offset by improving individuals' employability

**Tang N, Hu H, Xu F, and Zhu F. Personalized safety instruction system for construction site based on internet technology. *Safety Science*. 2019; 116(161-169).**

<http://doi.org/10.1016/j.ssci.2019.03.001>

Abstract: Safety instruction, as a critical part of safety management, plays an important role on construction sites. Unified safety training and irregular inspection are the main safety instructions methods. Considering the complex construction site and low management density, safety instructions received by workers are usually not timely and precise. To improve this situation, this paper established a real-time personalized safety instruction method which considers the different characteristics of workers and complex construction environment. A user-oriented PSIM system is developed in this paper based on GPS and cloud computing. This system could facilitate the collection of the main hazards, safety instructions to these hazards, and project information using questionnaire investigation and paper document. The collected information is classified by 5W1H method and transferred to particular workers according to their different characters, including locations, duties and working time. A case study is presented, which highlight its method for recording data, processing data, and sending personalized safety instruction, in a high-speed railway project. The results demonstrate that important construction information related to both safety and activity in field operations can be automatically processed and visualized in real-time, thus offering benefits to reducing hazards, improving safety awareness of workers, and creating a safer environment for workers effectively at a reasonable cost. Copyright © 2019 Elsevier Ltd

**Tondre S and Deshmukh T. Guidelines to sewing machine workstation design for improving working posture of sewing operator. *International Journal of Industrial Ergonomics*. 2019; 71(37-46).**

<http://doi.org/10.1016/j.ergon.2019.02.002>

Abstract: Sewing machine operators suffer from musculoskeletal problems imposed due to constrained restricted body postures. This study was conducted to investigate the effects of three design parameters (fore/aft sewing distance, sewing desk inclination and sewing desk height) of sewing workstation on postural variables and subjective experience and to develop guidelines for sewing workstation design. At a prototype of adjustable sewing workstation, ten professional sewing machine operators performed sewing task in nine different workstation arrangements. Sewing machine operators working posture and perceptions were recorded. It was shown that trunk, neck and arm postures were influenced by fore/aft sewing distance, sewing desk inclination and sewing desk height. The determinant factor for sewing machine operators' perception on the trunk and neck found to be fore/aft sewing distance, sewing desk inclination. The sewing desk height influences the arm posture significantly. Based on the results,



the following guidelines were developed: (1) Fore/aft sewing distance should be adjusted to 140 mm towards the sewing operator; (2) a 10degree sewing desk inclination towards sewing should be used at sewing workstations. (3) Sewing desk height should be adjusted between 762 mm and 787 mm from the ground. Copyright © 2019 Elsevier B.V

**Varianou-Mikellidou C, Boustras G, Dimopoulos C, Wybo J-L, Guldenmund FW, Nicolaidou O, et al. Occupational health and safety management in the context of an ageing workforce. Safety Science. 2019; 116(231-244.**

<http://doi.org/10.1016/j.ssci.2019.03.009>

Abstract: During the last decades, humanity experiences an increasing demographic change. The relative percentage of older people is growing, while fewer young employees are entering the labour force. This phenomenon is directly connected with ageing of the workforce. Older workers constitute a special group with characteristics that require special attention from the Occupational Health and Safety (OHS) point of view. The aim of this paper is to address what changes occur in ageing workers as a result of physical and psychological processes and the possible impacts of these at work in relation to OHS and the concept of sustainable work and workplaces. In addition, this paper discusses factors affecting work ability and worker's performance in relation to the ageing phenomenon. Finally, based on the literature, the paper proposes measures to minimize age-related risks and increase awareness. These measures should be designed and adopted at the early stages of working life and continue until retirement. By reducing risk factors of employees, the rate of occupational accidents and occupational diseases may be decreased, thus saving costs for employers, health system and insurance costs, while simultaneously facilitating a healthier retirement for the working-age population. Copyright © 2019 Elsevier Ltd

\*IWH authored publication.