

**IWH Research Alert**  
**November 27, 2020**

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**\*Biswas A, Gilbert-Ouimet M, Mustard CA, Glazier RH, and Smith PM. Combined associations of work and leisure time physical activity on incident diabetes risk. *American Journal of Preventive Medicine*. 2020; [epub ahead of print].**

<https://doi.org/10.1016/j.amepre.2020.09.017>

**Abstract:** Introduction This study examines the separate and combined relationships between occupational physical activity (characterized by nonaerobic activities such as heavy lifting and prolonged standing) and leisure time physical activity on future diabetes incidence. Methods Data from Ontario respondents aged 35-74 years from the 2003 Canadian Community Health Survey (N=40,507) were prospectively linked to the Ontario Diabetes Database for diabetes cases until 2017, with statistical analysis performed in 2019. Leisure time physical activity was self-reported and occupational physical activity estimated from occupation titles. The analytical sample consisted of 7,026 employed people without previous diabetes diagnoses, with 846 diabetes cases recorded. Cox proportional hazard models were constructed to evaluate relationships over a median follow-up time of 13.7 years. Results No relationships were observed between occupational physical activity



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and diabetes. High leisure time physical activity was associated with lower diabetes risk for low occupational physical activity and stationary jobs (hazard ratio=0.63, 95% CI=0.47, 0.85). No association was found for high leisure time physical activity on diabetes risk for high occupational physical activity (hazard ratio=1.07, 95% CI=0.73, 1.56) or low occupational physical activity with movement (hazard ratio=0.92, 95% CI=0.55, 1.55). Conclusions This study suggests that physical activity recommendations exclusively recommending increased physical activity may only be effective for the sedentary part of the working population in reducing diabetes risk. Findings await confirmation in comparable prospective studies in other populations

**\*Carnide N, Lee H, Frone MR, Furlan AD, and Smith PM. Patterns and correlates of workplace and non-workplace cannabis use among Canadian workers before the legalization of non-medical cannabis. Drug and Alcohol Dependence. 2020; 108386.**

<https://doi.org/10.1016/j.drugalcdep.2020.108386>

Abstract: BACKGROUND: Little information exists about cannabis use and its correlates among workers, particularly use before or at work, which may impact occupational safety. This study explores overall and workplace cannabis use patterns before legalization among Canadian workers and estimates the associations of personal and work-related characteristics with workplace and non-workplace cannabis use. METHODS: Cross-sectional data were collected from 1651 Canadian workers in June 2018. The primary outcome was past-year cannabis use pattern: use, including before/at work (past-year workplace use); use, but not before/at work (past-year non-workplace use); no past-year use (non-past-year use). The associations of personal (sociodemographic, health) and work-related factors with workplace and non-workplace cannabis use were estimated using multinomial logistic regression. RESULTS: A quarter of respondents reporting past-year cannabis use used cannabis before and/or at work. Respondents reporting workplace use were more likely to report more frequent cannabis use, use for medical or mixed purposes, and high THC cannabis use than workers reporting non-workplace use. Several personal factors were positively associated with workplace and non-workplace use (e.g., younger age, lower education). A safety-sensitive job, drug testing, supervisor



role, less job visibility, lower perceived ability of supervisors to identify use/impairment, and less restrictive workplace smoking policies were positively associated with workplace use only. CONCLUSIONS: A non-trivial proportion of workers reported workplace use, but the nature of this use is complex. Work-related factors addressing the likelihood of detection and being in a safety-sensitive job were associated with workplace use. Worker education on lower risk use appears warranted

**\*Van Eerd D, Moser C, and Saunders R. A research impact model for work and health. American Journal of Industrial Medicine. 2020; [epub ahead of print].**

<https://doi.org/10.1002/ajim.23201>

Abstract: Research organizations, governments and funding agencies are increasingly interested in the impact of research beyond academia. While a growing literature describes research impacts in healthcare and health services, little has focused on occupational health and safety research. This article describes a research impact model that has been in use for over a decade. The model was developed to track and describe the impact of research conducted by a mid-sized institute that focuses on work and health. Model development was informed by existing models, with the goal of contextualizing the institute's case studies describing three types of research impact: evidence of the diffusion of research; evidence of research informing decision-making; and evidence of societal impact. A logic model describes research actions and outcomes, as well as key audiences and knowledge transfer approaches. A unique element is its indication of the level of difficulty in determining types of impact. The model compares well with current research impact models developed or used in healthcare and health services research, and it has been useful in guiding a mid-sized research organization's process for tracking and describing the impact of its research. It may be useful to other small and mid-sized research organizations that focus on workplace health and safety

**\*Jetha A, Gignac MAM, Ibrahim S, and Martin Ginis KA. Disability and sex/gender intersections in unmet workplace support needs: findings from a large Canadian survey of workers. American Journal of Industrial Medicine. 2020; [epub ahead of**



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print].

<https://doi.org/10.1002/ajim.23203>

Abstract: Introduction: Individual attributes including disability and sex/gender have the potential to intersect and determine the likelihood of unmet workplace support needs. Our study compares unmet workplace support needs between workers with and without a disability, and according to disability type and sex/gender differences. Methods: Workers with (n = 901) and without (n = 895) a disability were surveyed to examine their need and use of workplace supports including job accommodations, work modifications and health benefits. A multivariable logistic model was conducted to examine the relationship between disability status, disability type and sex/gender and unmet workplace support needs. The model included interaction terms between sex/gender × physical disability, sex/gender × nonphysical disability, and sex/gender × physical and nonphysical disability. Results: Among participants with a disability, 24% had a physical disability, 20% had a nonphysical disability (e.g., cognitive, mental/emotional or sensory disability) and 56% had both physical and nonphysical disability. Over half of the respondents were women (56%). Results from the multivariable model showed that nondisabled women were more likely to report unmet workplace support needs when compared to nondisabled men (odds ratio [OR] = 1.54, 95% confidence interval [CI], 1.13-2.10). Findings also showed an intersection between the number and type of disability and sex/gender; women with both a physical and nonphysical disability had the greatest likelihood of reporting unmet workplace support needs when compared to nondisabled men (OR = 2.73; 95% CI, 1.83-4.08). Conclusions: Being a woman and having one or more disabilities can determine unmet workplace support needs. Strategies to address workplace support needs should consider the intersection between disability and sex/gender differences.

**De Carvalho D, Greene R, Swab M, and Godwin M. Does objectively measured prolonged standing for desk work result in lower ratings of perceived low back pain than sitting? A systematic review and meta-analysis. Work. 2020; 67(2):431-440. <https://doi.org/10.3233/WOR-203292>**

Abstract: BACKGROUND: Prolonged sitting has been shown to induce transient low back pain (LBP). Height adjustable office desks



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now present the opportunity to replace sitting with standing in the workplace. Since standing has also been associated with LBP, this may not be an advisable alternative. **OBJECTIVE:** To determine if objectively measured prolonged exposures to desk work while standing, compared to sitting, results in lower perceived LBP in healthy adults. **METHODS:** A systematic search of several databases was conducted. Two independent reviewers screened titles/abstracts and conducted a quality assessment. The results of three studies were pooled using an inverse variance random-effects meta-analysis. Heterogeneity was tested using the Chi-squared test and I<sup>2</sup> statistic. **RESULTS:** Objectively measured prolonged standing postures during desk work did not induce significantly less perceived LBP compared to seated postures (standardized mean difference 0.60, 95% CI -0.68 to 1.87, p=0.36.) There was significant heterogeneity, I<sup>2</sup>=90%). **CONCLUSIONS:** It appears that replacing seated desk work postures with standing for prolonged periods of time would not be recommended. Larger studies, including a wider age range and health history, conducted in the field with objective measures is recommended to obtain more generalizable data on which to base ergonomic standards for work postures

**Fauser D, Schmitt N, Golla A, Zimmer JM, Mau W, and Bethge M. Employability and intention to apply for rehabilitation in people with back pain: a cross-sectional cohort study. Journal of Rehabilitation Medicine. 2020; [epub ahead of print].**

<https://doi.org/10.2340/16501977-2767>

**Abstract:** **OBJECTIVES:** To analyse the association between self-reported prognosis of employability and health-related measures, and to clarify which determinants influence the intention to apply for medical rehabilitation. **DESIGN:** Cross-sectional study of a random sample of German employees. **PARTICIPANTS:** A total of 6,654 participants (58% female) aged 45-59 years with back pain during the last 3 months. **RESULTS:** Out of a total of 6,654 persons, 4,838 had a positive self-reported prognosis of employability. Persons with positive and negative prognoses clearly differ with regard to health-related measures. Of 1,816 persons who reported a negative prognosis, 26% stated an intention to apply for rehabilitation. Intention was determined mainly by perceived social support from family and friends (odds ratio (OR) 1.87; 95% confidence interval



(95% CI) 1.66-2.10), as well as physicians and therapists (OR 1.64; 95% CI 1.41-1.90). **CONCLUSION:** A negative self-reported prognosis of employability is associated with self-reported health restrictions that may determine the need for rehabilitation interventions. A considerable proportion of persons with self-reported health restrictions do not plan to use medical rehabilitation. Perceived social support is an important facilitator of intention to apply for rehabilitation. However, this study needs to be replicated in other populations combining self-reported and administrative data

**Garde AH, Begtrup L, Bjorvatn B, Bonde JP, Hansen J, Hansen AM, et al. How to schedule night shift work in order to reduce health and safety risks. Scandinavian Journal of Work, Environment & Health. 2020; 46(6):557-569.**

<https://doi.org/10.5271/sjweh.3920>

**Abstract:** Objectives This discussion paper aims to provide scientifically based recommendations on night shift schedules, including consecutive shifts, shift intervals and duration of shifts, which may reduce health and safety risks. Short-term physiological effects in terms of circadian disruption, inadequate sleep duration and quality, and fatigue were considered as possible links between night shift work and selected health and safety risks, namely, cancer, cardio-metabolic disease, injuries, and pregnancy-related outcomes. Method In early 2020, 15 experienced shift work researchers participated in a workshop where they identified relevant scientific literature within their main research area. Results Knowledge gaps and possible recommendations were discussed based on the current evidence. The consensus was that schedules which reduce circadian disruption may reduce cancer risk, particularly for breast cancer, and schedules that optimize sleep and reduce fatigue may reduce the occurrence of injuries. This is generally achieved with fewer consecutive night shifts, sufficient shift intervals, and shorter night shift duration. Conclusions Based on the limited, existing literature, we recommend that in order to reduce the risk of injuries and possibly breast cancer, night shift schedules have: (i)  $\leq 3$  consecutive night shifts; (ii) shift intervals of  $\geq 11$  hours; and (iii)  $\leq 9$  hours shift duration. In special cases - eg, oil rigs and other isolated workplaces with better possibilities to adapt to daytime sleep - additional or other



recommendations may apply. Finally, to reduce risk of miscarriage, pregnant women should not work more than one night shift in a week.

**Herber GC, Schipper M, Koopmanschap M, Proper K, van der Lucht F, Boshuizen H, et al. Health expenditure of employees versus self-employed individuals; a 5 year study. Health Economics. 2020; 29(12):1606-1619.**

<https://doi.org/10.1002/hec.4149>

Abstract: It is unclear to what extent self-employed choose to become self-employed. This study aimed to compare the health care expenditures-as a proxy for health-of self-employed individuals in the year before they started their business, to that of employees.

Differences by sex, age, and industry were studied. In total, 5,741,457 individuals aged 25-65 years who were listed in the tax data between 2010 and 2015 with data on their health insurance claims were included. Self-employed and employees were stratified according to sex, age, household position, personal income, region, and industry for each of the years covered. Weighted linear regression was used to compare health care expenditures in the preceding (year x-1) between self-employed and employees (in year x). Compared with employees, expenditures for hospital care, pharmaceutical care and mental health care were lower among self-employed in the year before they started their business. Differences were most pronounced for men, individuals  $\geq 40$  years and those working in the industry and energy sector, construction, financial institutions, and government and care. We conclude that healthy individuals are overrepresented among the self-employed, which is more pronounced in certain subgroups. Further qualitative research is needed to investigate the reasons why these subgroups are more likely to choose to become self-employed

**Januario LB, Stevens ML, Mathiassen SE, Holtermann A, Karstad K, and Hallman DM. Combined effects of physical behavior compositions and psychosocial resources on perceived exertion among eldercare workers. Annals of Work Exposures and Health. 2020; 64(9):923-935.**

<https://doi.org/10.1093/annweh/wxaa079>

Abstract: OBJECTIVES: High perceived physical exertion is common in eldercare workers and a strong predictor for impaired health.



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However, little is known on how physical behaviors at work associate with physical exertion in this group. The aim of this study was to determine the extent to which the composition of physical behaviors at work is associated with perceived physical exertion in nursing home eldercare workers, and the extent to which these associations are modified by psychosocial resources. **METHODS:** Our population consisted of 399 female eldercare workers from 126 wards in 20 different nursing homes. We evaluated time spent in physical behaviors at work [sitting, standing still, light activities (LAs), and moderate to vigorous activities (MVAs)] using triaxial accelerometers worn, on average, for three working days. We accounted for inherent codependency between the behaviors using compositional data analysis. We used multilevel linear mixed regression models to determine associations between the behaviors and perceived exertion, measured on a numeric rating scale (0-10), and included interactions between each behavior and psychosocial resources (influence at work, social support, and quality of leadership) to determine a possible moderating effect of resources. Regression results were illustrated using isotemporal substitution. **RESULTS:** Sitting was negatively ( $\beta$ : -0.64;  $P < 0.01$ ) while MVA was positively ( $\beta$ : 0.95;  $P = 0.02$ ) associated with perceived exertion. According to isotemporal substitution, replacing 30 min of MVA by sitting would, for an average worker, be associated with a decrease in physical exertion by -0.14 on the 0-10 scale. Job resources marginally moderated the association between LA and exertion. Thus, among workers with low influence and low social support, we found a positive association between LA and exertion, while that was not found for workers with medium or high influence and support (interactions for influence and support:  $P = 0.08$  and  $P = 0.10$ ). **CONCLUSIONS:** Our findings suggest that reallocating time from MVA to sitting can mitigate perceived physical exertion in eldercare workers. More time in LA increased physical exertion only for workers with low psychosocial resources, supporting a positive effect of a better psychosocial work environment in elderly care

**Mahdavi N, Dianat I, Heidarimoghadam R, Khotanlou H, and Faradmal J. A review of work environment risk factors influencing muscle fatigue. International Journal of Industrial**



**Ergonomics. 2020; 80:103028.**

<https://doi.org/10.1016/j.ergon.2020.103028>

**McClure ES, Vasudevan P, Bailey Z, Patel S, and Robinson WR. Racial capitalism within public health: how occupational settings drive COVID-19 disparities. American Journal of Epidemiology. 2020; 189(11):1244-1253.**

<https://doi.org/10.1093/aje/kwaa126> [open access]

Abstract: Epidemiology of the US coronavirus disease 2019 (COVID-19) outbreak focuses on individuals' biology and behaviors, despite centrality of occupational environments in the viral spread. This demonstrates collusion between epidemiology and racial capitalism because it obscures structural influences, absolving industries of responsibility for worker safety. In an empirical example, we analyzed economic implications of race-based metrics widely used in occupational epidemiology. In the United States, White adults have better average lung function and worse hearing than Black adults. Impaired lung function and impaired hearing are both criteria for workers' compensation claims, which are ultimately paid by industry. Compensation for respiratory injury is determined using a race-specific algorithm. For hearing, there is no race adjustment. Selective use of race-specific algorithms for workers' compensation reduces industries' liability for worker health, illustrating racial capitalism operating within public health. Widespread and unexamined belief in inherent physiological inferiority of Black Americans perpetuates systems that limit industry payouts for workplace injuries. We see a parallel in the epidemiology of COVID-19 disparities. We tell stories of industries implicated in the outbreak and review how they exemplify racial capitalism. We call on public health professionals to critically evaluate who is served and neglected by data analysis and to center structural determinants of health in etiological evaluation

**Ortlieb R and Winterheller J. Behind migrant and non-migrant worktime inequality in Europe: institutional and cultural factors explaining differences. British Journal of Industrial Relations. 2020; 58(4):785-815.**

<https://doi.org/10.1111/bjir.12521> [open access]

Abstract: Abstract Migrants often work longer hours than their non-migrant counterparts. In this article, we examine reasons behind this



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inequality, arguing that institutional working time configurations at the country level have impact on worktime inequality. Our cross-country comparative study uses data from the European Labour Force Survey. We focus on France, Sweden, Austria and the UK as archetypal examples of working time configurations and breadwinner models in Europe. Our findings indicate that institutional and cultural factors play a role in working hour differences between migrants and non-migrants. We conclude that more centralized worktime regulation and bargaining foster equality, and we suggest several avenues for future research

**Pindek S, Lucianetti L, Kessler SR, and Spector PE. Employee to leader crossover of workload and physical strain. *International Journal of Stress Management*. 2020; 27(4):326-334.**

<https://doi.org/10.1037/str0000211>

**Sadeghi S, Soltanmohammadlou N, and Rahnamayiezekavat P. A systematic review of scholarly works addressing crane safety requirements. *Safety Science*. 2021; 133:105002.**

<https://doi.org/10.1016/j.ssci.2020.105002>

**Santiago KM, Louzado-Feliciano P, Baum J, Bakali U, and Caban-Martinez AJ. Self-reported and objectively measured occupational exposures, health, and safety concerns among fishermen: a cross-sectional Fishing Industry Safety and Health (FISH) pilot study. *American Journal of Industrial Medicine*. 2020; [epub ahead of print].**

<https://doi.org/10.1002/ajim.23198>

Abstract: Background: Fishing industry workers are exposed to hazardous working conditions, engage in strenuous labor, and work long hours in variable weather conditions. Despite these known employment challenges, little is known of their perceived occupational health and safety concerns. In this pilot study, we: (1) describe fishermen's perceptions on worker- and organizational-level characteristics that impact occupational health and safety; and (2) estimate environmental exposure to polycyclic aromatic hydrocarbons (PAHs) encountered during fishing activities. Methods: We collected both qualitative and quantitative data from Mississippi and Florida fishermen. Using an ethnographic approach, the study team



conducted 1-h key informant interviews, administered a one-page demographic survey, and collected objective measurements to PAHs using silicone-based passive sampling wristbands. Results: Study participants (n = 17) had a mean age of 50.9 years (SD = 11.7), 88.2% were male, 94.1% white, 100.0% non-Hispanic/Latino, and 52.9% were married. Approximately, 87.5% reported fishing as their primary job, with a mean of 26.4 years in the industry (SD = 15.3). Four broad themes describing the culture of the fishing industry, common workplace exposures that impact fishermen's safety and health, and facilitators and barriers to safety while working in the fishing industry were documented. Deckhands had the lowest mean exposure to PAHs (8.3 ppb), followed by crew members (11.0 ppb), captains (82.64 ppb), and net makers (208.1 ppb). Conclusions: Gulf coast fishermen expressed specific occupational health and safety concerns and were exposed to carcinogenic PAHs during regular work. Opportunities exist and strategies are needed for health protection and health promotion interventions among Gulf fishermen.

**da Silva JMN, Gontijo LA, Bornia AC, da Silva LB, Leite WK, de Araujo Vieira EM, et al. Construction of an osteomuscular discomfort scale for the upper region of the body of footwear industry workers. International Journal of Industrial Ergonomics. 2020; 80:103048.**

<https://doi.org/10.1016/j.ergon.2020.103048>

**Trogolo MA, Morera LP, Castellano E, Sponton C, and Medrano LA. Work engagement and burnout: real, redundant, or both? A further examination using a bifactor modelling approach. European Journal of Work and Organizational Psychology. 2020; 29(6):922-937.**

<https://doi.org/10.1080/1359432X.2020.1801642>

**\*IWH authored publications.**



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