

IWH Research Alert
October 25, 2019

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***Hylkema TH, Stevens M, Selzer F, Amick BA, Katz JN, and Brouwer S. Activity impairment and work productivity loss after total knee arthroplasty: a prospective study. *Journal of Arthroplasty*. 2019; 34(11):2637-2645.**

<https://doi.org/10.1016/j.arth.2019.06.015>

Abstract: BACKGROUND: Total knee arthroplasty (TKA) is increasingly performed among working-aged individuals, highlighting the importance of work-related outcomes. Therefore, the aim is to examine the extent of both activity impairment outside work and work productivity (absenteeism, presenteeism, at-work productivity loss) at 6 and 24 months post-TKA surgery. Additionally, associated risk factors with these outcomes were evaluated. METHODS: This analysis included 183 patients <70 years undergoing TKA who completed questionnaires pre-operatively and during follow-up. Outcomes were derived from the Work Productivity and Activity Impairment questionnaire and included activity impairment, absenteeism (sick leave), presenteeism (reduced work performance), and at-work productivity loss (overall work productivity loss). All outcomes were scaled 0%-100%, with higher percentages indicating higher impairments. Covariates included age, gender, education, pain catastrophizing, pain, function, psychological distress, and knee-related and health-related quality of life. Linear and logistic regression

was used to assess associations between covariates and Work Productivity and Activity Impairment scores at follow-up. RESULTS: At 6 months, the mean activity impairment was 22.8% (standard deviation [SD] 23.5) dropping to 17.1% (23.1) by 24 months. Among workers, presenteeism was 18.4% (24.6) and at-work productivity loss was 20.8% (26.1). Both dropped significantly by 24 months to 14.2% (22.4) and 12.9% (20.9), respectively. Absenteeism levels were low at both time points. Pain catastrophizing was associated with all outcomes. CONCLUSION: This study showed that activity impairment and work productivity loss are common following TKA, decreased significantly over time, but still existed 2 years post-operatively. Those reporting high levels of pain catastrophizing may benefit from targeted rehabilitation guidance to reduce and possibly prevent activity impairment and work productivity loss

Allison RW, Hon CKH, and Xia B. Construction accidents in Australia: evaluating the true costs. Safety Science. 2019; 120:886-896.

<https://doi.org/10.1016/j.ssci.2019.07.037>

Badu E, O'Brien AP, and Mitchell R. An integrative review on methodological considerations in mental health research: design, sampling, data collection procedure and quality assurance. Archives of Public Health. 2019; 77:37.

<https://doi.org/10.1186/s13690-019-0363-z> [open access]

Abstract: Background: Several typologies and guidelines are available to address the methodological and practical considerations required in mental health research. However, few studies have actually attempted to systematically identify and synthesise these considerations. This paper provides an integrative review that identifies and synthesises the available research evidence on mental health research methodological considerations. Methods: A search of the published literature was conducted using EMBASE, Medline, PsycINFO, CINAHL, Web of Science, and Scopus. The search was limited to papers published in English for the timeframe 2000-2018. Using pre-defined inclusion and exclusion criteria, three reviewers independently screened the retrieved papers. A data extraction form was used to extract data from the included papers. Results: Of 27 papers meeting the inclusion criteria, 13 focused on qualitative

research, 8 mixed methods and 6 papers focused on quantitative methodology. A total of 14 papers targeted global mental health research, with 2 papers each describing studies in Germany, Sweden and China. The review identified several methodological considerations relating to study design, methods, data collection, and quality assurance. Methodological issues regarding the study design included assembling team members, familiarisation and sharing information on the topic, and seeking the contribution of team members. Methodological considerations to facilitate data collection involved adequate preparation prior to fieldwork, appropriateness and adequacy of the sampling and data collection approach, selection of consumers, the social or cultural context, practical and organisational skills; and ethical and sensitivity issues. Conclusion: The evidence confirms that studies on methodological considerations in conducting mental health research largely focus on qualitative studies in a transcultural setting, as well as recommendations derived from multi-site surveys. Mental health research should adequately consider the methodological issues around study design, sampling, data collection procedures and quality assurance in order to maintain the quality of data collection

Buscemi V, Chang WJ, Liston MB, McAuley JH, and Schabrun SM. The role of perceived stress and life stressors in the development of chronic musculoskeletal pain disorders: a systematic review. Journal of Pain. 2019; 20(10):1127-1139. <https://doi.org/10.1016/j.jpain.2019.02.008>

Abstract: The etiologic role of work-related psychological stress in the development of musculoskeletal pain disorders (MDs) has been systematically investigated. Less clear, however, is the role of perceived stress and life stressors. This review aimed to assess the evidence for an etiologic role of perceived stress and life stressors in the development of chronic MDs. Database searches were conducted to identify prospective longitudinal studies that assessed perceived stress and life stressors in individuals without, or in the first 6 weeks of, musculoskeletal pain. The primary outcome was the development of a chronic MD. Methodologic quality was investigated using an adapted version of the Quality Assessment Tool for Observational Cohort studies and Cross-Sectional studies, and the strength of evidence using the Grading of Recommendations Assessment,

Development and Evaluation approach. Seven studies were included representing data from 6 independent cohorts. There was some evidence to support the etiologic role of perceived stress and life stressors in the development of arthritis (low quality) and chronic spinal pain (low quality). The limited number of studies, the poor quality of the evidence, and the heterogeneity of stress measures used across studies suggest that further high quality prospective studies are required to clarify the role of perceived stress and life stressors in the development of chronic MDs. PROSPERO: CRD42017059949 PERSPECTIVE: This review summarizes and critically appraises the evidence for the etiologic role of perceived stress and life stressors in the development of chronic MDs. The limited number of studies, the low quality of the evidence, and the heterogeneity across studies suggest that further research is needed on perceived stress and life stressors in MDs

Coomer K and Houdmont J. Contribution of work ability and core self-evaluations to worker health. Occupational Medicine. 2019; 69(5):366-371.

<https://doi.org/10.1093/occmed/kqz081>

Abstract: BACKGROUND: Work ability (WA) concerns the capacity to manage job demands in relation to physical and psychological resources. Core self-evaluations (CSE) refer to a composite personality construct comprising self-esteem, locus of control, self-efficacy and emotional stability traits. Studies have shown the independent contribution of WA and CSE to work outcomes, yet none has explored their additive contribution, when applied together, to identify workers at risk of impaired health and performance-related outcomes. AIMS: The aim was to explore the contribution of WA and CSE to explaining variance in psychological distress and work engagement in a sample of UK manufacturing sector workers. METHODS: A self-report questionnaire containing validated measures of WA, CSE, psychological distress and work engagement was administered to employees in four UK manufacturing organizations. Bivariate correlations were calculated to identify patterns of relationships between the variables and hierarchical linear regression analyses performed to examine the incremental contribution of WA and CSE to the target variables. RESULTS: Analyses were conducted on data contributed by 311 workers (21%

response rate). WA accounted for around one-quarter of the variance in psychological distress and around one-fifth of the variance in work engagement. The addition of CSE explained a further 10% (psychological distress) and 7% (work engagement) of the variance. CONCLUSIONS: These exploratory findings suggest that WA and CSE might be useful in the identification of workers at risk of poor psychological well-being and work effectiveness in UK manufacturing. Longitudinal sector-representative studies are required to establish the constructs' predictive power

Dopart PJ, Locke SJ, Cocco P, Bassig BA, Josse PR, Stewart PA, et al. Estimation of source-specific occupational benzene exposure in a population-based case-control study of non-Hodgkin lymphoma. *Annals of Work Exposures and Health*. 2019; 63(8):842-855.

<https://doi.org/10.1093/annweh/wxz063>

Abstract: OBJECTIVES: Occupational exposures in population-based case-control studies are increasingly being assessed using decision rules that link participants' responses to occupational questionnaires to exposure estimates. We used a hierarchical process that incorporated decision rules and job-by-job expert review to assign occupational benzene exposure estimates in a US population-based case-control study of non-Hodgkin lymphoma. METHODS: We conducted a literature review to identify scenarios in which occupational benzene exposure has occurred, which we grouped into 12 categories of benzene exposure sources. For each source category, we then developed decision rules for assessing probability (ordinal scale based on the likelihood of exposure > 0.02 ppm), frequency (proportion of work time exposed), and intensity of exposure (in ppm). The rules used the participants' occupational history responses and, for a subset of jobs, responses to job- and industry-specific modules. For probability and frequency, we used a hierarchical assignment procedure that prioritized subject-specific module information when available. Next, we derived job-group medians from the module responses to assign estimates to jobs with only occupational history responses. Last, we used job-by-job expert review to assign estimates when job-group medians were not available or when the decision rules identified possible heterogeneous or rare exposure scenarios. For intensity, we

developed separate estimates for each benzene source category that were based on published measurement data whenever possible. Frequency and intensity annual source-specific estimates were assigned only for those jobs assigned $\geq 75\%$ probability of exposure. Annual source-specific concentrations (intensity x frequency) were summed to obtain a total annual benzene concentration for each job. RESULTS: Of the 8827 jobs reported by participants, 8% required expert review for one or more source categories. Overall, 287 (3.3%) jobs were assigned $\geq 75\%$ probability of exposure from any benzene source category. The source categories most commonly assigned $\geq 75\%$ probability of exposure were gasoline and degreasing. The median total annual benzene concentration among jobs assigned $\geq 75\%$ probability was 0.11 ppm (interquartile range: 0.06-0.55). The highest source-specific median annual concentrations were observed for ink and printing (2.3 and 1.2 ppm, respectively). CONCLUSIONS: The applied framework captures some subject-specific variability in work tasks, provides transparency to the exposure decision process, and facilitates future sensitivity analyses. The developed decision rules can be used as a starting point by other researchers to assess occupational benzene exposure in future population-based studies

Dumas O, Varraso R, Boggs KM, Quinot C, Zock JP, Henneberger PK, et al. Association of occupational exposure to disinfectants with incidence of chronic obstructive pulmonary disease among US female nurses. JAMA Network Open. 2019; 2(10):e1913563.

<https://doi.org/10.1001/jamanetworkopen.2019.13563> [open access]

Abstract: Importance: Exposure to disinfectants in health care workers has been associated with respiratory health outcomes, including asthma. Despite the biological plausibility of an association between disinfectants (irritant chemicals) and risk of chronic obstructive pulmonary disease (COPD), available data are sparse. Objective: To investigate the association between exposure to disinfectants and COPD incidence in a large cohort of US female nurses. Design, Setting, and Participants: The Nurses' Health Study II is a US prospective cohort study of 116429 female registered nurses from 14 US states who were enrolled in 1989 and followed up

through questionnaires every 2 years since. The present study included women who were still in a nursing job and had no history of COPD in 2009, and used data from the 2009 through 2015 questionnaires. Clean and complete data used for this analysis were available in July 2018, and analyses were conducted from September 2018 through August 2019. Exposures: Occupational exposure to disinfectants, evaluated by questionnaire and a job-task-exposure matrix (JTEM). Main Outcomes and Measures: Incident physician-diagnosed COPD evaluated by questionnaire. Results: Among the 73 262 women included in the analyses, mean (SD) age at baseline was 54.7 (4.6) years and 70 311 (96.0%) were white, 1235 (1.7%) black, and 1716 (2.3%) other; and 1345 (1.8%) Hispanic, and 71 917 (98.2%) non-Hispanic. Based on 368145 person-years of follow-up, 582 nurses reported incident physician-diagnosed COPD. Weekly use of disinfectants to clean surfaces only (16 786 [22.9%] of participants exposed) and to clean medical instruments (13 899 [19.0%] exposed) was associated with COPD incidence, with adjusted hazard ratios of 1.38 (95% CI, 1.13-1.68) for cleaning surfaces only and 1.31 (95% CI, 1.07-1.61) for cleaning medical instruments after adjustment for age, smoking (pack-years), race, ethnicity, and body mass index. High-level exposure, evaluated by the JTEM, to several specific disinfectants (ie, glutaraldehyde, bleach, hydrogen peroxide, alcohol, and quaternary ammonium compounds) was significantly associated with COPD incidence, with adjusted hazard ratios ranging from 1.25 (95% CI, 1.04-1.51) to 1.36 (95% CI, 1.13-1.64). Associations were not modified by smoking or asthma status (P for interaction > .15). Conclusions and Relevance: These longitudinal results suggest that regular use of chemical disinfectants among nurses may be a risk factor for developing COPD. If future studies confirm these results, exposure-reduction strategies that are compatible with infection control in health care settings should be developed

Lund T, Flachs EM, Sorensen JA, Ebbehøj NE, Bonde JP, and Agner T. A job-exposure matrix addressing hand exposure to wet work. *International Archives of Occupational & Environmental Health*. 2019; 92(7):959-966.

<https://doi.org/10.1007/s00420-019-01435-2>

Abstract: PURPOSE: The aim of this study was to create a job-

exposure matrix (JEM) for wet work. A JEM is a tool used to assess exposure to potential health hazards in occupational epidemiological studies. It can be used when counselling concerning job change/job choice, as a medico-legal tool when recognizing diseases as occupational and when planning interventions regarding prevention of, in this case, occupational hand eczema. METHODS: The study population was based on results from national surveys on working environment performed by the National Research Centre for the Working Environment in Denmark in 2000, 2005, and 2010 (National Research Centre for the Working Environment). We assessed responses on questions regarding wet hands, glove wear and total wet work. For the JEM a cutoff of 2 h total wet work/day was chosen as the exposure measurement. The proportion of responses of 2 h total wet work/day in each profession is illustrated as a number between 0 and 1 equal to 0-100% of the responses. RESULTS: Total wet work was most frequent among cleaners (domestic, office, and hotel cleaning), butchers and fishmongers, cooks, beauticians (hairdressers, barbers, related work) and health care workers (home-based personal workers, dentists, dental assistants). Regarding differences between sexes we found that indifferent of age and profession, women had 78% higher odds of having wet work. CONCLUSION: We found that wet work as an exposure varies among professions depending on whether wet hands or glove wear is assessed. A JEM is a useful tool to assess the extent of the exposure, wet work, independent of prior perceptions of classical wet work professions

Maeng D, Cornell AE, and Nasra GS. Utilization of an employee behavioral health program and its effects on outcomes for depression and anxiety disorders. Journal of Occupational & Environmental Medicine. 2019; 61(10):812-817.

<https://doi.org/10.1097/JOM.0000000000001678>

Abstract: OBJECTIVE: To examine the impact of an employer-sponsored behavioral health program on depression and anxiety by assessing dose effect of psychotherapy. METHODS: A retrospective data analysis of patients with baseline scores more than or equal to 10 on the Patient Health Questionnaire (PHQ9) or the Generalized Anxiety Disorder 7-item scale (GAD7). Survival analyses were conducted to assess whether those with a higher number of therapy

sessions per episode (dose) achieved faster response (score reduction by 50% or below 10). RESULTS: Patients with medium (8 to 12 visits) or high (more than 12 visits) dose achieved faster response than those with low dose (less than eight visits; hazard ratios more than 1.5, $P < 0.05$). No significant difference was found between the medium and high dose. CONCLUSION: Higher dose of psychotherapy is correlated with improved behavioral health outcomes, although there appears to be no incremental benefit beyond a certain level

Neis B and Lippel K. Occupational health and safety and the mobile workforce: insights from a Canadian research program. *New Solutions*. 2019; 29(3):297-316.

<https://doi.org/10.1177/1048291119876681>

Other Articles in the Special Issue

Cedillo L, Lippel K, and Nakache D. Factors influencing the health and safety of temporary foreign workers in skilled and low-skilled occupations in Canada. *New Solutions*. 2019; 29(3):422-458.

<https://doi.org/10.1177/1048291119867757>

Gesualdi-Fecteau D, Nakache D, and Matte Guilmain L. Travel time as work time? Nature and scope of Canadian labor law's protections for mobile workers. *New Solutions*. 2019; 29(3):349-370.

<https://doi.org/10.1177/1048291119867750>

Hill NS, Dorow S, Barnetson B, Martinez JF, and Matsunaga-Turnbull J. Occupational health and safety for migrant domestic workers in Canada: dimensions of (im)mobility. *New Solutions*. 2019; 29(3):397-421.

<https://doi.org/10.1177/1048291119867740>

Howse D. "You can't solve precarity with precarity." The new Alberta workers program: an interview with Jared Matsunaga-Turnbull, executive director of the Alberta Workers' Health Centre. *New Solutions*. 2019; 29(3):459-

477.

<https://doi.org/10.1177/1048291119869165>

Lippel K and Walters D. Regulating health and safety and workers' compensation in Canada for the mobile workforce: now you see them, now you don't. *New Solutions*. 2019; 29(3):317-348.

<https://doi.org/10.1177/1048291119868805>

Shan D and Lippel K. Occupational health and safety challenges from employment-related geographical mobility among Canadian seafarers on the Great Lakes and St. Lawrence Seaway. *New Solutions*. 2019; 29(3):371-396.

<https://doi.org/10.1177/1048291119870762>

Oneal G, Graves JM, Diede T, Postma J, Barbosa-Leiker C, and Butterfield P. Balance, health, and workplace safety: experiences of new nurses in the context of total worker health. *Workplace Health & Safety*. 2019; 67(10):520-528.

<https://doi.org/10.1177/2165079919833701>

Abstract: Transitioning into independent professional practice may be a difficult and trying process for newly licensed nurses, who may be at risk for burnout and quitting their jobs. Issues related to new nurses' well-being at work may also impact their personal lives. Using thematic analysis within the framework of Total Worker Health, this study examined factors related to the overall work, safety, and health of newly licensed nurses that should be addressed in work environments to promote well-being and prevent burnout and attrition. The main component of Total Worker Health is to find and understand the relevant issues that lead to safety and health risks in the workplace and affect workers' well-being at work and home. The overarching concept of Balance between Work and Life included three main themes: Health, Work Environment, and Learning to Be (a nurse). These themes with their subthemes described the difficulties participants had in balancing the complex interactions of work conditions and social life changes during the transition from student to professional nurse. Participants identified new physical health problems, mental health challenges, physical violence, lack of support structures at work, and alterations in family and friend

relationships. However, they also developed protective factors from new connections with coworkers. These findings showed that new nurses are vulnerable to many factors at home and work that affect well-being and may lead to burnout and attrition. Implications include interventions at work that focus on health promotion, group support, and safety risk prevention through occupational nurse management

Pfortner TK, Pfaff H, and Hower KI. Trends in the association of different forms of precarious employment and self-rated health in Germany. An analysis with the German Socio-Economic Panel between 1995 and 2015. Journal of Epidemiology & Community Health. 2019; 73(11):1002-1011.

<https://doi.org/10.1136/jech-2018-211933>

Abstract: BACKGROUND: Precarious employment has increased in Germany by means of labour market flexibilisation throughout the 1990s and 2000s. In this study, trends in the association of self-rated health (SRH) with different dimensions of precarious employment by gender in Germany between 1995 and 2015 were assessed considering different periods of labour market reforms and the Great Recession. METHODS: Analyses were conducted using the German Socio-Economic Panel from 1995 to 2015. All employed individuals aged 18-67 years and living in private households were considered for analysis to examine the risks of poor SRH by low wage, working poverty, non-standard working time arrangements and perceived job insecurity by gender. Predicted probabilities, adjusted risk ratio (ARR), adjusted risk difference (ARD) and trends were examined using pooled interval logistic regression with individual-clustered standard errors. RESULTS: Relative and absolute differences in SRH rose significantly over time by perceived job insecurity for men, but not for women. Working poverty appeared to be significantly associated with SRH in the Great Recession and the post-Recession period for both gender. Non-standard working time arrangements were not significantly associated with SRH for both gender, and low wage appeared to be significantly associated with SRH only for men in the post-Recession period. CONCLUSIONS: The results highlighted the relevance of labour market reforms of deregulation and flexibilisation in Germany to differences in SRH by specific forms of precarious employment and gender differences in the impact of labour market reforms on precarious employment and health

Pilbeam C, Denyer D, Doherty N, and Davidson R. Designing safer working interventions through a literature review using a mechanisms-based approach. Safety Science. 2019; 120:352-361.

<https://doi.org/10.1016/j.ssci.2019.07.017>

van de Voort I, De Rijk A, Hensing G, and Bertilsson M. Determinants of managerial preventive actions in relation to common mental disorders at work: a cross-sectional study among Swedish managers. Journal of Occupational & Environmental Medicine. 2019; 61(10):854-862.

<https://doi.org/10.1097/JOM.0000000000001629>

Abstract: OBJECTIVE: Manager characteristics (personal, work-, and competence-related) were investigated as determinants of managerial preventive actions (MPAs) in relation to common mental disorders (CMDs) among employees. METHODS: A web survey (n = 2921) among Swedish managers measured diverse managerial characteristics and two types of MPAs: reviewing assignments and work situation (MPA-review); talking about CMDs at the work place (MPA-talk). RESULTS: MPA-review was reported by 50% and MPA-talk by 57% of managers. Characteristics that related to more MPAs were female gender, workplace offering lectures on CMDs, workplace offering stress counseling, being responsible for the work environment, management training on CMDs, and more than 10 years of managerial experience (MPA-talk only). CONCLUSION: Managers who are female, have had training on CMDs, and work for organizations paying attention to CMD prevention initiate MPAs more often

Wang Y, McKee M, Torbica A, and Stuckler D. Systematic literature review on the spread of health-related misinformation on social media. Social Science & Medicine. 2019; 240:112552.

<https://doi.org/10.1016/j.socscimed.2019.112552> [open access]

Abstract: Contemporary commentators describe the current period as "an era of fake news" in which misinformation, generated intentionally or unintentionally, spreads rapidly. Although affecting all areas of life, it poses particular problems in the health arena, where it can delay or prevent effective care, in some cases threatening the lives of individuals. While examples of the rapid spread of misinformation

date back to the earliest days of scientific medicine, the internet, by allowing instantaneous communication and powerful amplification has brought about a quantum change. In democracies where ideas compete in the marketplace for attention, accurate scientific information, which may be difficult to comprehend and even dull, is easily crowded out by sensationalized news. In order to uncover the current evidence and better understand the mechanism of misinformation spread, we report a systematic review of the nature and potential drivers of health-related misinformation. We searched PubMed, Cochrane, Web of Science, Scopus and Google databases to identify relevant methodological and empirical articles published between 2012 and 2018. A total of 57 articles were included for full-text analysis. Overall, we observe an increasing trend in published articles on health-related misinformation and the role of social media in its propagation. The most extensively studied topics involving misinformation relate to vaccination, Ebola and Zika Virus, although others, such as nutrition, cancer, fluoridation of water and smoking also featured. Studies adopted theoretical frameworks from psychology and network science, while co-citation analysis revealed potential for greater collaboration across fields. Most studies employed content analysis, social network analysis or experiments, drawing on disparate disciplinary paradigms. Future research should examine susceptibility of different sociodemographic groups to misinformation and understand the role of belief systems on the intention to spread misinformation. Further interdisciplinary research is also warranted to identify effective and tailored interventions to counter the spread of health-related misinformation online

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