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***Landsman V, Landsman D, Li CS, and Bang H. Overdispersion models for correlated multinomial data: applications to blinding assessment. *Statistics in Medicine*. 2019; [Epub ahead of print]. <https://doi.org/10.1002/sim.8344>**

Abstract: Overdispersion models have been extensively studied for correlated normal and binomial data but much less so for correlated multinomial data. In this work, we describe a multinomial overdispersion model that leads to the specification of the first two moments of the outcome and allows the estimation of the global parameters using generalized estimating equations (GEE). We introduce a Global Blinding Index as a target parameter and illustrate the application of the GEE method to its estimation from (1) a clinical trial with clustering by practitioner and (2) a meta-analysis on psychiatric disorders. We examine the impact of a small number of clusters, high variability in cluster sizes, and the magnitude of the intraclass correlation on the performance of the GEE estimators of the Global Blinding Index using the data simulated from different models. We compare these estimators with the inverse-variance weighted estimators and a maximum-likelihood estimator, derived under the Dirichlet-multinomial model. Our results indicate that the performance of the GEE estimators was satisfactory even in situations with a small number of clusters, whereas the inverse-

variance weighted estimators performed poorly, especially for larger values of the intraclass correlation coefficient. Our findings and illustrations may be instrumental for practitioners who analyze clustered multinomial data from clinical trials and/or meta-analysis

***Mior S, Wong J, Sutton D, Beliveau PJH, Bussieres A, Hogg-Johnson S, et al. Understanding patient profiles and characteristics of current chiropractic practice: a cross-sectional Ontario Chiropractic Observation and Analysis Study (O-COAST). *BMJ Open*. 2019; 9(8):e029851.**

<https://doi.org/10.1136/bmjopen-2019-029851> [open access]

Abstract: OBJECTIVES: There is no current detailed profile of people seeking chiropractic care in Canada. We describe the profiles of chiropractors' practice and the reasons, nature of the care provided to their patients and extent of interprofessional collaborations in Ontario, Canada. DESIGN: Cross-sectional observational study. SETTING: Primary care setting in Ontario, Canada. PARTICIPANTS: We randomly recruited chiropractors from a list of registered chiropractors (n=3978) in active practice in 2015. Of the 135 randomly selected chiropractors, 120 were eligible, 43 participated and 42 completed the study. OUTCOME MEASURES: Each chiropractor recorded information for up to 100 consecutive patient encounters, documenting patient health profiles, reasons for encounter, diagnoses and care provided. Descriptive statistics summarised chiropractor, patient and encounter characteristics, with analyses accounting for clustering and design effects. RESULTS: Chiropractors provided data on 3523 chiropractor-patient encounters. More than 65% of participating chiropractors were male, mean age 44 years and had practised on average 15 years. The typical patient was female (59% of encounters), between 45 and 64 years (43%) and retired (21%) or employed in business and administration (13%). Most (39.4%) referrals were from other patients, with 6.8% from physicians. Approximately 68% of patients paid out of pocket or claimed extended health insurance for care. Most common diagnoses were back (49%, 95% CI 44 to 56) and neck (15%, 95% CI 13 to 18) problems, with few encounters related to maintenance/preventive care (0.86%, 95% CI 0.2 to 3.9) and non-musculoskeletal problems (1.3%, 95% CI 0.7 to 2.3). The most common treatments included spinal manipulation (72%), soft tissue therapy (70%) and mobilisation

(35%). **CONCLUSIONS:** This is the most comprehensive profile to date of chiropractic practice in Canada. People who present to Ontario chiropractors are mostly adults with a musculoskeletal condition. Our results can be used by stakeholders to make informed decisions about workforce development, education and healthcare policy related to chiropractic care

Arends I, Almansa J, Stansfeld SA, Amick BC, van der Klink JJJ, and Bultmann U. One-year trajectories of mental health and work outcomes post return to work in patients with common mental disorders. Journal of Affective Disorders. 2019; 257:263-270.

<https://doi.org/10.1016/j.jad.2019.07.018>

Abstract: **BACKGROUND:** We investigated one-year trajectories of symptom recovery, work functioning and the return to work percentage (RTW%) among patients with common mental disorders (CMDs). **METHODS:** Data were used from a cluster-randomised controlled trial evaluating a problem-solving intervention for CMD patients (N=158) who had returned to work. Information on anxiety and depressive symptoms, work functioning and RTW% was collected at baseline and 3, 6 and 12 months follow-up. Latent class growth analyses were used to identify trajectories for the four outcomes and investigate how these trajectories clustered in higher order latent classes. Additionally, we investigated the relation between patient characteristics and class membership. **RESULTS:** We identified four trajectories for all four outcomes and derived three higher order latent classes: slow recovery (42% [66/158]) (high anxiety and depressive symptoms, moderate to low work functioning and fast RTW); fast recovery (25% [40/158]) (low anxiety and depressive symptoms, high work functioning and fast RTW); and gradual recovery (33% [52/158]) (decreasing anxiety and depressive symptoms, increasing or low work functioning and fast RTW). Participants with a higher work engagement and readiness to stay at work were more likely to belong to the fast recovery class. **LIMITATIONS:** Due to the relatively small sample size, some trajectories consisted of few participants. Symptom severity was self-reported. **CONCLUSIONS:** Many CMD patients experience high levels of mental health symptoms and work functioning problems during the year post RTW. Creating realistic recovery expectations

(for both patients and their environments) could be important for successful and sustainable recovery and work participation

Baker NA, Feller H, and Freburger J. Does insurance coverage affect use of tests and treatments for working age individuals with carpal tunnel syndrome in the United States? Analysis of the national ambulatory medical care survey (2005-2014). Archives of Physical Medicine & Rehabilitation. 2019; 100(9):1592-1598.

<https://doi.org/10.1016/j.apmr.2019.03.014>

Abstract: OBJECTIVE: Carpal tunnel syndrome (CTS) is frequently seen as a work-related disorder. Few studies have examined the treatment of CTS by insurance coverage, and none have used a large, population-based dataset. This study examined the extent to which the use of CTS tests and treatments varied for those on workers' compensation insurance (WCI) vs private insurance and Medicaid, controlling for patient and provider characteristics. DESIGN: Analysis of 10 years of data (2005-2014) from the National Ambulatory Medical Care Survey. SETTING: United States office-based physician practices. PARTICIPANTS: Adults 18-64 years who had a physician visit for CTS (N=23,236,449). INTERVENTIONS: Not applicable. MAIN OUTCOME MEASURES: We examined use of 2 diagnostic tests, imaging and electromyography, and 7 treatments: casting, splinting, occupational therapy (OT), physical therapy (PT), carpal tunnel release surgery, steroid injections, and nonsteroidal anti-inflammatory drug (NSAID). RESULTS: Individuals who sought care for CTS were more likely to be covered by private insurance (56.9%) than WCI (9.8%) or Medicaid (6.5%). The most commonly prescribed treatment for all types of insurance coverage was splints, followed by NSAID prescription, and OT or PT therapies. Steroid injections (1.2%) and CTS surgery (4.5%) were used significantly less than other treatment types. Patients on WCI were less likely to receive diagnostic tests, and more likely to receive OT or PT than those on other types of insurance coverage. CONCLUSION: Patients with CTS who seek ambulatory care are most likely to be covered by private insurance. Insurance coverage appears to play a role in treatment and diagnostic choices for CTS

Bouffard J, Durand MJ, and Coutu MF. Adaptation of a guide to equip employers to manage the gradual return to work of individuals with a musculoskeletal disorder. Journal of Occupational Rehabilitation. 2019; 29(3):625-635.

<https://doi.org/10.1007/s10926-019-09827-4>

Abstract: Purpose The gradual return to work (GRTW) of injured workers poses numerous challenges for workplaces. The aim of this study was to provide employers with an adapted tool to support them in managing GRTWs following a musculoskeletal disorder (MSD), by adapting the Guide for estimation of margin of manoeuvre (Durand et al. in 7th international scientific conference on prevention of work-related musculoskeletal disorders, 2010) and then evaluating the acceptability of the adapted version. Methods A mixed methods design was used. Content experts were surveyed about the content and form of a first version of the adapted tool. Proposed modifications were then discussed in a group meeting until consensus was reached on the changes to be made. The acceptability of the new version was determined by conducting semi-structured interviews of potential users. A thematic analysis of the verbatim transcript was performed. Results Nine experts reached a consensus on 20 modifications, which yielded a tool comprising an instruction guide and a planning worksheet. The eight companies consulted found the tool acceptable, useful, and pertinent, but also identified a few changes to be made. Conclusion The use of original methods made it possible to adapt the content of the tool while taking evidence-based data and user needs into account, all of which contributed to its acceptance. The tool will support employers and standardize management of GRTWs following MSD-related sick leaves. Possible avenues for future research emerged from this study: evaluate the acceptability of new formats and a transdiagnostic version of the tool, and consult workers

Chen Y, Zhang M, Qiu W, Sun X, Wang X, Dong Y, et al. Prevalence and determinants of noise-induced hearing loss among workers in the automotive industry in China: a pilot study. Journal of Occupational Health. 2019; 61(5):387-397.

<https://doi.org/10.1002/1348-9585.12066> [open access]

Abstract: OBJECTIVE: Data on noise-induced hearing loss (NIHL) in the automotive industry are rare. This pilot study aimed to investigate the prevalence and determinants of NIHL among workers in the

automotive industry in China. **METHODS:** A cross-sectional survey was conducted with 6557 participants from the automotive industry. The questionnaire survey was administered, and individual noise exposure level (LAeq.8h) and hearing loss level were measured. **RESULTS:** Of participants, 96.43% were male; the median age was 27.0 years and 28.82% had NIHL defined as adjusted high-frequency noise-induced hearing loss (AHFNIHL). Concerning individual noise levels (LAeq.8h), 62.53% exceeded 85 dB(A), which were mainly concentrated in various jobs, including metal cutting, surface treatment, stamping, welding, grinding, assembly, plastic molding, and forging. Each typical noise source generated its own unique temporal waveform shape with the type of non-Gaussian noise. Of workers, 53.15% regularly used hearing protector devices (HPD), and the proportion of regular HPD use increased with LAeq.8h . The trend test showed that the prevalence of AHFNIHL in male workers significantly increased with an increase in LAeq.8h at <94 dB(A) and cumulative noise exposure (CNE) in each age group ($P < 0.05$ or $P < 0.01$). A logistic regression analysis showed that CNE and HPD usage frequency were important factors contributing to AHFNIHL. **CONCLUSIONS:** CNE and HPD usage frequency were the determinants for NIHL. Much more human surveys are needed to understand the prevalence and determinants of NIHL in the automotive industry in China

Drain JR and Reilly TJ. Physical employment standards, physical training and musculoskeletal injury in physically demanding occupations. *Work*. 2019; 63(4):495-508.

<https://doi.org/10.3233/WOR-192963>

Abstract: **BACKGROUND:** Physically demanding occupations such as the military, firefighting and law enforcement have adopted physical employment standards (PES). The intent of PES is to match the physical capacity of personnel with the physical demands of job tasks. Inadequate physical capacity can affect occupational task performance as well musculoskeletal injury (MSKI) risk. **OBJECTIVE:** To present contemporary evidence on the relationship(s) between PES, physical training, physical capacity and MSKI in physically demanding occupations, and provide recommendations regarding physical training for improved occupational performance and reduced MSKI risk. **METHODS:** This narrative review draws on evidence from

104 published sources. RESULTS: Physical training is central to the development and maintenance of occupationally-relevant physical capacity, as well as mitigating MSKI risk associated with job performance. In addition, given the prevalence of manual handling tasks, strength training needs to be emphasised in physical training regimen. CONCLUSIONS: PES development can inform both physical training and injury prevention strategies in physically demanding occupations. Furthermore, a physical performance continuum is essential to through-career maintenance of occupational performance and health, and the preservation of organisational capability. Finally, organisations should consider the potential to implement PES as maximal performance tests to better understand the relationship between occupational task performance and MSKI risk

Gold PB, Crane KT, Fabian ES, and Morris TR. Strategies for recruiting participants into randomized controlled trials: a cross-program profile of the PROMISE demonstration program. Journal of Vocational Rehabilitation. 2019; 51(2):243-252. <https://doi.org/10.3233/JVR-191042>

Iwakiri K, Takahashi M, Sotoyama M, Liu X, and Koda S. Priority approaches of occupational safety and health activities for preventing low back pain among caregivers. Journal of Occupational Health. 2019; 61(5):339-348. <https://doi.org/10.1002/1348-9585.12055> [open access]

Abstract: OBJECTIVES: The incidence of occupational low back pain (LBP) is high among caregivers. The use of care equipment and training about care methods could prevent LBP among caregivers. However, in care facilities in Japan, these measures are not adequately employed. Moreover, the care facilities have faced issues regarding poor staffing in recent years. The present study investigated the relationship between LBP and occupational safety and health activities (OSHAs) for preventing LBP among caregivers and aimed to validate the priority approaches of OSHA. METHODS: This cross-sectional study was conducted in care facilities for the elderly in Japan. Questionnaires for administrators and caregivers were distributed to 1,000 facilities and 5,000 caregivers, respectively. Questionnaires completed by 612 facilities and 2,712 caregivers were

analyzed. RESULTS: No direct association was observed between severe LBP and OSHA, but indirect association was done. A significant relationship was noted between severe LBP and the care methods. Direct factors causing severe LBP were lifting a resident using human power and taking an unsuitable posture. These care methods were associated with the following OSHAs: promoting the use of care equipment, training about care methods, and consultation regarding the use of care equipment and employing an appropriate care method with the person in charge. CONCLUSIONS: These OSHAs decreased lifting a resident using human power and taking an unsuitable posture, which are the primary risk factors of LBP. Therefore, these OSHAs should be implemented as priority approaches to prevent LBP among caregivers in care facilities for the elderly

Kalakoti P, Volkmar AJ, Bedard NA, Eisenberg JM, Hendrickson NR, and Pugely AJ. Preoperative chronic opioid therapy negatively impacts long-term outcomes following cervical fusion surgery. Spine. 2019; 44(18):1279-1286.

<https://doi.org/10.1097/BRS.0000000000003064>

Abstract: STUDY DESIGN: Retrospective, observational.

OBJECTIVE: The aim of this study was to define the impact of preoperative chronic opioid therapy (COT) on outcomes following cervical spine fusions. SUMMARY OF BACKGROUND DATA: Opioid therapy is a commonly practiced method to control acute postoperative pain. However, concerns exist relating to use of prescription opioids, including inherent risk of abuse, tolerance, and inferior outcomes following major surgery. METHODS: A commercial dataset was queried from 2007 to 2015 for patients undergoing primary cervical spine arthrodesis [ICD-9 codes 81.01-81.03]. Primary outcome measures were 1-year and 2-year reoperation rates, emergency department (ED) visits, adverse events, and prolonged postoperative opioid use. Secondary outcomes included short-term outcomes including 90-day complications (cardiac, renal, neurologic, infectious, etc.). COT was defined as a history of opioid prescription filling within 3 months before surgery and was the primary exposure variable of interest. Generalized linear models investigated the association of preoperative COT on primary/secondary endpoints following risk-adjustment. RESULTS:

Overall, 20,730 patients (51.3% female; 85.9% >50 years) underwent primary cervical spine arthrodesis. Of these, 10,539 (n = 50.8%) met criteria for COT. Postoperatively, 75.3% and 29.8% remained on opioids at 3 months and 1 year. Multivariable models identified an association between COT and an increased risk of 90-day ED visit [odds ratio (OR): 1.25; P < 0.001] and wound complications (OR: 1.24; P = 0.036). At 1 year, COT was strongly associated with reoperations (OR: 1.17; P = 0.043), ED visits (OR: 1.31; P < 0.001), and adverse events including wound complications (OR: 1.32; P < 0.001), infections (OR: 1.34; P = 0.042), constipation (OR: 1.11; P = 0.032), neurological complications (OR: 1.44; P = 0.01), acute renal failure (OR: 1.24; P = 0.004), and venous thromboembolism (OR: 1.20; P = 0.008). At 2 years, COT remained a significant risk factor for additional long-term negative outcomes such as reoperations, including adjacent segment disc disease (OR: 1.21; P = 0.005), ED visits (OR: 1.32; P < 0.001), and other adverse events. Preoperative COT was associated with prolonged postoperative narcotic use at 3 months (OR: 1.30; P < 0.001), 1 year (OR: 5.17; P < 0.001), and at 2 years (OR: 5.75; P < 0.001) after cervical arthrodesis.

CONCLUSION: Preoperative COT is a modifiable risk factor that is strongly associated with prolonged postoperative opioid use. In addition, COT was associated with inferior short-term and long-term outcomes after cervical spine fusion. **LEVEL OF EVIDENCE:** 3

Mueller L, Wolfe WR, Neylan TC, McCaslin SE, Yehuda R, Flory JD, et al. Positive impact of IPS supported employment on PTSD-related occupational-psychosocial functional outcomes: results from a VA randomized-controlled trial. *Psychiatric Rehabilitation Journal*. 2019; 42(3):246-256.

<https://doi.org/10.1037/prj0000345>

Abstract: **OBJECTIVE:** Posttraumatic stress disorder (PTSD) has significant negative effects on occupational, interpersonal, and social functioning. Supported employment is highly effective in helping people with a diagnosis of PTSD obtain and maintain competitive employment. However, less is known about the impact of supported employment on functioning in work or school, social, and interpersonal areas as specifically related to the symptoms of PTSD. **METHOD:** The Veterans Individual Placement and Support Toward Advancing Recovery study was a prospective, multisite, randomized,

controlled trial that compared Individual Placement and Support (IPS) supported employment with a stepwise vocational rehabilitation involving transitional work (TW) assignments with unemployed veterans with PTSD diagnoses (n = 541) at 12 Veterans Administration (VA) medical centers. This analysis focuses on the PTSD-related functional outcomes over the 18-month follow-up period. RESULTS: Compared with those randomized to TW, the PTSD Related Functioning Inventory (PRFI) total score significantly improved for participants randomized to IPS (LSMeans difference = -3.92, 95% CI [-7.49, -.36]; p = .03) over 18 months. When the Work/School subscale of the PRFI was removed from the analysis, the IPS group continued to show significant improvements compared with the TW group on the PRFI relationship and lifestyle domains (LSMeans difference = -2.37, 95% CI [-4.74, .00]; p = .05), suggesting a positive impact of IPS beyond work/school functioning. CONCLUSION: Compared with the usual-care VA vocational services for veterans with PTSD, IPS supported employment is associated with greater improvement in overall PTSD-related functioning, including occupational, interpersonal, and lifestyle domains. In addition to superior employment outcomes, IPS has a positive impact on occupational-psychosocial functioning outcomes. (PsycINFO Database Record (c) 2019 APA, all rights reserved)

O'Sullivan K, O'Keeffe M, Forster BB, Qamar SR, van der Westhuizen A, and O'Sullivan PB. Managing low back pain in active adolescents. Best Practice & Research, Clinical Rheumatology. 2019; 33(1):102-121.

<https://doi.org/10.1016/j.berh.2019.02.005>

Abstract: Adolescent low back pain has received limited research attention despite its potentially considerable impact on quality of life. The role of diagnostic triage to identify serious or specific pathology and/or order relevant investigations is considered. An overview of contemporary pain mechanisms is provided, with specific reference to the wide range of risk factors for persistent low back pain. Education and exercise framed within a biopsychosocial framework are the cornerstones of treatment. There is a lack of data on more comprehensive personalized treatment approaches among adolescents. One such approach - Cognitive Functional Therapy - which has shown promise in adults and active adolescents with low

back pain, is described and illustrated using a case study. The most promising avenues, in practice and research, may be those that view adolescent low back pain as less of a local structural spinal issue and more of an indication of the general health of the adolescent

Stackhouse M and Turner N. How do organizational practices relate to perceived system safety effectiveness? Perceptions of safety climate and co-worker commitment to safety as workplace safety signals. Journal of Safety Research. 2019; 70:59-69.

<https://doi.org/10.1016/j.jsr.2019.04.002>

Sundstrup E, Hansen AM, Mortensen EL, Poulsen OM, Clausen T, Rugulies R, et al. Physical capability in midlife and risk of disability pension and long-term sickness absence: prospective cohort study with register follow-up. Scandinavian Journal of Work, Environment & Health. 2019; [Epub ahead of print].

<https://doi.org/10.5271/sjweh.3842> [open access]

Abstract: Objective The aim of this study was to determine the association of physical capability with health-related labor market outcomes among older workers. Methods The prospective risk of disability pension and long-term sickness absence (LTSA) of ≥ 6 weeks was estimated from physical capability on 5076 older workers (age 49-63 years) from the Copenhagen Aging and Midlife Biobank (CAMB). Physical capability was objectively measured through nine different tests (jump performance, postural balance, chair-rise, explosive muscle strength, maximal strength of the hand, back and abdominal muscles, lung capacity, and aerobic fitness) and linked to a high-quality register on social transfer payments among all Danish residents. Cox-regression analyses estimated the association of physical capability with risk of disability pension and LTSA. Results For all measures, low physical capability [≥ 1 standard deviation (SD) below the mean for each gender] was associated with increased risk of disability pension and/or LTSA, whereas high physical capability (≥ 1 SD above the mean for each gender) was not. A capability-response association was observed between the number of tests with low capability and disability pension and LTSA ($P < 0.0001$) - with the risk-estimate for disability pension being 8.52 (95% confidence interval 3.98-18.25) when low capability was present in

>/=5 physical tests. Population attributable risks analyses indicate that 42% of the disability pension cases were attributable to low physical capability whereas this was the case for 12% of the LTSA cases. Conclusions Using objective measures of predictors and outcomes, our study shows that low physical capability in midlife was associated with increased risk of disability pension and LTSA. The results indicate that increasing physical capability to an average level among older workers with low capability could potentially contribute to preventing >40% of premature exits from the labor market

Topor A, Stefansson CG, Denhov A, Bulow P, and Andersson G. Recovery and economy; salary and allowances: a 10-year follow-up of income for persons diagnosed with first-time psychosis. Social Psychiatry and Psychiatric Epidemiology. 2019; 54(8):919-926.

<https://doi.org/10.1007/s00127-019-01655-4>

Abstract: PURPOSE: Persons with severe mental health problems (SMHP) point out financial strain as one of their main problems. De-institutionalisation in welfare countries has aimed at normalisation of their living conditions. The aim of the study was to follow the changes in income and source of income during a 10-year period for persons with a first-time psychosis diagnosis (FTPD). METHODS: Data were gathered from different registers. Data from persons with FTPD were compared to data on the general population. Two groups with different recovery paths were also compared: one group without contact with the mental health services during the last five consecutive years of the 10-year follow-up, and the other with contact with both 24/7 and community-based services during the same period. RESULTS: SMHP led to poverty, even if the financial effects of SMHP were attenuated by welfare interventions. Even a recovery path associated with work did not resolve the inequalities generated by SMHP. CONCLUSIONS: Attention should be paid to the risks of confusing the effects of poverty with symptoms of SMHP and thus pathologizing poverty and its impact on human beings. Adequate interventions should consider to improve the financial situation of persons with SMHP

White C, Green RA, Ferguson S, Anderson SL, Howe C, Sun J, et al. The influence of social support and social integration factors

on return to work outcomes for individuals with work-related injuries: a systematic review. Journal of Occupational Rehabilitation. 2019; 29(3):636-659.

<https://doi.org/10.1007/s10926-018-09826-x> [open access]

Abstract: Purpose In occupational rehabilitation, the biopsychosocial model endorses the role of social factors in worker recovery. We conducted a systematic review to explore three questions examining the role of social support for the return-to-work (RTW) of individuals with work-related injury: (1) What are the worker-identified social barriers and facilitators in RTW; (2) What is the relationship between social factors and RTW; and (3) What is the effectiveness of social interventions for RTW. Methods Systematic searches of six databases were conducted for each research question. These identified 11 studies meeting inclusion criteria for Research Question 1, and 12 studies for Research Question 2. No studies were identified that met inclusion criteria for Research Question 3. A narrative synthesis approach was used to analyse the included studies. Results Research Question 1 identified five themes in social barriers and facilitators to RTW, including contact/communication, person-centred approaches, mutual trust, reaction to injury, and social relationships. Research Question 2 identified moderate support for reaction to injury and social integration/functioning as predictors of RTW and weak evidence for co-worker support. Four studies reported significant associations between social factors and RTW, six reported mixed findings with at least one significant social predictor, and two found no significant relationships. However, conclusions were limited by the inconsistency in measurement of social factors. Conclusions Our findings indicate that social support and integration may influence RTW following work-related injury, and highlights the need for further systematic examination of social factors in the field of occupational rehabilitation

Yoshikawa E and Kogi K. Outcomes for facilitators of workplace environment improvement applying a participatory approach. Journal of Occupational Health. 2019; 61(5):415-425.

<https://doi.org/10.1002/1348-9585.12065> [open access]

Abstract: OBJECTIVES: The purpose of this study was to determine changes in awareness, behavior, and relationships among facilitators who were involved in facilitating the conduct of the participatory

workplace improvement program and to examine the facilitators' outcomes as a result of their active involvement in the program. The outcome components were also examined in relationship to their associations with various factors. **METHODS:** An anonymous self-administered questionnaire survey was conducted for 83 facilitators. Exploratory factor analysis was applied to determine the facilitators' outcomes. The relationship between those elements which influenced the outcomes was taken into account by means of hierarchical multiple regression analysis. **RESULTS:** The outcomes for facilitators consisted of four sub-concepts: "knowing practical ways and strategies to ensure full participation," "building confidence and self-development," "improving safety and health-risk sensitivity," and "gaining better-than-expected results based on developing relationships with workers." According to the results of hierarchical multiple regression analysis, facilitators' outcomes were significantly associated with the realization of creativity, sense of solution for safety and health issues, and facilitators' involvement. **CONCLUSIONS:** It is suggested that the role of a facilitator dynamically changes through a participatory workplace improvement program as a key person in the workplace. Supporting acting facilitators' initiatives in the process of workplace improvement programs, as well as promoting the active involvement of workers and managers were considered useful for effective implementation of workplace improvement programs

*IWH authored publications.