

IWH Research Alert
November 9, 2018

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***Abma F, Bjorner JB, Amick BC, III, and Bultmann U. Two valid and reliable Work Role Functioning Questionnaire short-versions were developed: WRFQ 5 and WRFQ 10. Journal of Clinical Epidemiology. 2019; 105:101-111.**

<https://doi.org/10.1016/j.jclinepi.2018.09.005>

Abstract: OBJECTIVE: The study aims to develop and validate short versions of the Work Role Functioning Questionnaire v2.0 (WRFQ) that retain the measurement properties of the full-length 27-item questionnaire. STUDY DESIGN AND SETTING: Six cross-sectional Dutch samples (N=2433) were used, containing data on gender, self-rated health, job type and WRFQ scores. Indicators from classical test theory and item response theory methods were used along with evaluation of translatability and conceptual considerations to identify short version candidate items. To ensure content validity, the item selection was made within the five-factor structure established for the WRFQ - leading to a 5-item and a 10-item short version. Bland Altman analyses of agreement and interclass correlations with the full WRFQ were used to establish the best scoring procedure. Discriminant validity was evaluated for the short versions and compared with the full-length 27-item version. RESULTS: Both short versions showed acceptable agreement with the full-length 27-item version using simple scoring procedures. Both also showed comparable or stronger validity than the full WRFQ in known groups comparisons. CONCLUSION: Both short versions can be used to measure Work Role Functioning in working samples with mixed clinical conditions and job types.

***Vaillancourt S, Beaton D, and Maybee A. Engaging patients to develop a patient-reported outcome measure for the emergency department. CMAJ.**

2018; 190(Suppl):S50-S52.
<https://doi.org/10.1503/cmaj.180353>

Awang H and Mansor N. Predicting employment status of injured workers following a case management intervention. *Safety and Health at Work*. 2018; 9(3):347-351.

<https://doi.org/10.1016/j.shaw.2017.11.001> [open access]

Abstract: Background: The success of an injury intervention program can be measured by the proportion of successful return to work (RTW). This study examined factors of successful return to employment among workers suffering from work-related injuries. Methods: Data were obtained from the Social Security Organization, Malaysia database consisting of 10,049 RTW program participants in 2010-2014. The dependent variable was the RTW outcome which consisted of RTW with same employer, RTW with new employer or unsuccessful return. Multinomial logistic regression was performed to test the likelihood of successful return with same employer and new employer against unsuccessful return. Results: Overall, 65.3% of injured workers were successfully returned to employment, 52.8% to the same employer and 12.5% to new employer. Employer interest; motivation; age 30-49 years; intervention less than 9 months; occupational disease; injuries in the lower limbs, upper limbs, and general injuries; and working in the manufacturing, services, and electrical/electronics were associated with returning to work with the same employer against unsuccessful return. Male, employer interest, motivation, age 49 years or younger, intervention less than 6 months, occupational disease, injuries in the upper limbs and services sector of employment were associated with returning to new employer against unsuccessful return. Conclusion: There is a need to strengthen employer commitment for early and intensified intervention that will lead to improvement in the RTW outcome

Bae SW, Yun S, Lee YS, Yoon JH, Roh J, and Won JU. Income changes due to disability ratings and participation in economic activities caused by industrial accidents: a population-based study of data from the fourth panel study of workers' compensation insurance (PSWCI). *International Journal of Environmental Research and Public Health*. 2018; 15(11):E2478.

<https://doi.org/10.3390/ijerph15112478> [open access]

Abstract: Industrial accidents cost a huge amount of money, but they also have negative consequences in many respects. We analyzed the data of the first to fourth panel study of workers' compensation insurance (PSWCI). Repeated measures ANOVA was used to compare the annual income before and after the industrial accident, and a general linear model was used to identify changes in income due to disability ratings and participation in economic activities. The wages before the industrial accident and the annual income varied among the disabilities ratings. In addition, for affected workers, the average income during four years post-accident was lower than the average income before the accident. Regression analysis to see changes in income after the industrial accident

showed that the group with a disability rating of 11(-)14 and no injuries had a suffered a greater income decrease than those with a disability rating of 1(-)3, and the unemployment group saw a greater decrease in income than the employment group. Workers who were affected by industrial accidents received lower incomes than before the accident, and even considering different disability ratings, there was a greater decrease in income among the unemployed group than in the working group

Berglund E, Anderzen I, Andersen A, Carlsson L, Gustavsson C, Wallman Tet al. Multidisciplinary intervention and acceptance and commitment therapy for return-to-work and increased employability among patients with mental illness and/or chronic pain: a randomized controlled trial. International Journal of Environmental Research and Public Health. 2018; 15(11):E2424.

<https://doi.org/10.3390/ijerph15112424> [open access]

Abstract: BACKGROUND: People on long-term sick leave often have a long-lasting process back to work, where the individuals may be in multiple and recurrent states; i.e., receiving different social security benefits or working, and over time they may shift between these states. The purpose of this study was to evaluate the effects of two vocational rehabilitation programs, compared to a control, on return-to-work (RTW) or increased employability in patients on long-term sick leave due to mental illness and/or chronic pain. METHODS: In this randomized controlled study, 427 women and men were allocated to either (1) multidisciplinary team management, i.e., multidisciplinary assessments and individual rehabilitation management, (2) acceptance and commitment therapy (ACT), or (3) control. A positive outcome was defined as RTW or increased employability. The outcome was considered negative if the (part-time) wage was reduced or ceased, or if there was an indication of decreased employability. The outcome was measured one year after entry in the project and analyzed using binary and multinomial logistic regressions. RESULTS: Participants in the multidisciplinary team group reported having RTW odds ratio (OR) 3.31 (95% CI 1.39(-)7.87) compared to the control group in adjusted models. Participants in the ACT group reported having increased employability OR 3.22 (95% CI 1.13(-)9.15) compared to the control group in adjusted models. CONCLUSIONS: This study of vocational rehabilitation in mainly female patients on long-term sick leave due to mental illness and/or chronic pain suggests that multidisciplinary team assessments and individually adapted rehabilitation interventions increased RTW and employability. Solely receiving the ACT intervention also increased employability

Braglia M, Di Donato L, Gabbrielli R, and Marrazzini L. The house of safety: a novel method for risk assessment including human misbehaviour. Safety Science. 2018; 110(Part A):249-264.

<https://doi.org/10.1016/j.ssci.2018.08.015>

Brakenridge CL, Healy GN, Winkler EAH, and Fjeldsoe BS. What do workers do to reduce their sitting time? The relationships of strategy use and workplace support with desk-based workers' behavior changes in a workplace-delivered sitting-reduction and activity-promoting intervention. Journal of Occupational and Environmental Medicine. 2018; 60(11):1026-1033.

<https://doi.org/10.1097/JOM.0000000000001419>

Abstract: OBJECTIVE: To explore workers' sitting-reduction and activity-promoting strategy use following an intervention targeting these changes, and whether strategy use and perceived workplace support impacted on 3-month sitting and activity outcomes. METHODS: This secondary analysis in desk-based workers (n = 83) utilized data collected on questionnaire-derived strategy use and workplace support, and activPAL3-derived sitting (total; prolonged, ≥ 30 minutes) and activity (standing; stepping) at work. RESULTS: Fourteen strategies were commonly used during the intervention. Increased usage of some strategies were significantly ($P < 0.05$) associated with beneficial changes in prolonged sitting or stepping only. Workplace support was significantly beneficially associated with changes in sitting, prolonged sitting, and stepping; these associations were largely independent of strategy use changes. CONCLUSIONS: Strategies were highly used, with increased use associated with some behavioral improvements. Workplace support appears essential for improving sitting and activity in the workplace

Gransjoen AM, Wiig S, Lysdahl KB, and Hofmann BM. Development and conduction of an active re-implementation of the Norwegian musculoskeletal guidelines. BMC Research Notes. 2018; 11(1):785.

<https://doi.org/10.1186/s13104-018-3894-4> [open access]

Abstract: OBJECTIVE: Significant geographical variations in the use of diagnostic imaging have been demonstrated in Norway and elsewhere. Non-traumatic musculoskeletal conditions is one area where this has been demonstrated. A national musculoskeletal guideline was implemented in response by online publishing and postal dissemination in Norway in 2014 by national policy makers. The objective of our study was to develop and conduct an intervention as an active re-implementation of this guideline in one Norwegian county to investigate and facilitate guideline adherence. The development and implementation process is reported here, to facilitate understanding of the future evaluation results of this study. RESULTS: The consolidated framework for implementation research guided the intervention development and implementation. The implementation development was also based on earlier reported success factors in combination with interviews with general practitioners and radiologists regarding facilitators and barriers to guideline adherence. A combined implementation strategy was developed, including educational meetings, shortening of the guideline and easier access. All the aspects of the implementation strategy were adapted towards general practitioners, radiological personnel and the Norwegian Labor and Welfare Administration. Sixteen

educational meetings were held, and six educational videos were made for those unable to attend, or where meetings could not be held

Kim D. Does paid vacation leave protect against depression among working Americans? A national longitudinal fixed effects analysis. *Scandinavian Journal of Work, Environment & Health*. 2018; [Epub ahead of print].

<https://doi.org/10.5271/sjweh.3751>

Abstract: Objectives The United States is the only advanced economy globally that does not guarantee its workers paid vacation leave. Although empirical studies have linked paid vacation leave to happiness and stress, no study has investigated the association between paid vacation leave and depression. Using a nationally-representative longitudinal sample of 3380 working men and women aged 45-52 years from the National Longitudinal Survey of Youth 1979, this study explored whether paid vacation leave may protect against depression. Methods Multivariate linear and logistic regression models were employed to estimate the impacts of the number of annual paid vacation days of leave measured at age 40 on depression measured using the 7-item Center for Epidemiologic Studies Depression Scale (CES-D) short form (CES-D-SF) scale at age 50. Models were adjusted for demographic and socioeconomic factors, physical health, weekly hours, and individual fixed effects. Results For every ten additional days of paid vacation leave, the odds of depression in women was 29% lower [odds ratio (OR) 0.71, 95% confidence interval (CI) 0.55-0.92, P=0.01]; there was no association in men. Linear regression models showed no association in either men or women. For every 10 days of paid leave, the odds of depression were 36% lower in White women and 38% lower in women with ≥ 2 children. Conclusions This study provides the first evidence on the linkage between paid vacation leave and depression, and supports a protective effect in White women with ≥ 2 children. Should this association be truly causal, and assuming a uniform effect across all ages in working adult women, the results from this study would suggest that a hypothetical increase in the average number of days of paid vacation leave of 10 days could avoid an estimated 568 442 cases of depression in women each year and lead to a cost savings of US\$2.94 billion annually. Policies that mandate paid vacation leave may have marked positive impacts on the population health and economic burden of depression among working women in the USA

Laurent J, Chmiel N, and Hansez I. Jobs and safety: a social exchange perspective in explaining safety citizenship behaviors and safety violations. *Safety Science*. 2018; 110(Part A):291-299.

<https://doi.org/10.1016/j.ssci.2018.08.027>

Lee WJ, Choi SH, Shin JE, Oh CY, Ha NH, Lee USet al. Effects of an online imagery-based treatment program in patients with workplace-related posttraumatic stress disorder: a pilot study. *Psychiatry Investigation*. 2018; [Epub ahead of print].

<https://doi.org/10.30773/pi.2018.09.28> [open access]

Abstract: **OBJECTIVE:** We developed easily accessible imagery-based treatment program for patients with post-traumatic stress disorder (PTSD) related to workplace accidents and investigated the effects of the program on various PTSD related symptoms. **METHODS:** The program was based on an online platform and consisted of eight 15-min sessions that included script-guided imagery and supportive music. Thirty-five patients with workplace-related PTSD participated in this program 4 days per week for 4 weeks. Its effects were examined using self-report questionnaires before and after the take-home online treatment sessions. **RESULTS:** After completing the 4-week treatment program, patients showed significant improvements in depressed mood ($t=3.642$, $p=0.001$) based on the Patient Health Questionnaire-9 (PHQ-9), anxiety ($t=3.198$, $p=0.003$) based on the Generalized Anxiety Disorder seven-item (GAD-7) scale, and PTSD symptoms ($t=5.363$, $p<0.001$) based on the Posttraumatic Stress Disorder Check List (PCL). In particular, patients with adverse childhood experiences exhibited a greater degree of relief related to anxiety and PTSD symptoms than those without adverse childhood experiences. **CONCLUSION:** The present results demonstrated that the relatively short online imagery-based treatment program developed for this study had beneficial effects for patients with workplace-related PTSD

Maden M, McMahon N, Booth A, Dickson R, Paisley S, and Gabbay M. Toward a theory-led metaframework for considering socioeconomic health inequalities within systematic reviews. Journal of Clinical Epidemiology. 2018; 104:84-94.

<https://doi.org/10.1016/j.jclinepi.2018.08.008>

Abstract: **OBJECTIVES:** To develop a theory-led framework to inform reviewers' understanding of what, how, and why health care interventions may lead to differential effects across socioeconomic groups. **STUDY DESIGN AND SETTING:** A metaframework approach combined two theoretical perspectives (socioeconomic health inequalities and complex interventions) into a single framework to inform socioeconomic health inequality considerations in systematic reviews. **RESULTS:** Four theories relating to complexity within systematic reviews and 16 health inequalities intervention theories informed the development of a metaframework. Factors relating to the type of intervention, implementation, context, participant response, and mechanisms associated with differential effects across socioeconomic groups were identified. The metaframework can inform; reviewer discussions around how socioeconomic status (SES) can moderate intervention effectiveness during question formulation, approaches to data extraction and help identify a priori analysis considerations. **CONCLUSION:** The metaframework offers a transparent, practical, theory-led approach to inform a program theory for what, how, and why interventions work for different SES groups in systematic reviews. It can enhance existing guidance on conducting systematic reviews that consider health inequalities, increase awareness of how SES can moderate intervention

effectiveness, and encourage a greater engagement with theory throughout the review process

Mulla DM, Wiebenga EG, Chopp-Hurley JN, Kaip L, Jarvis RS, Stephens A., et al. The effects of lower extremity strengthening delivered in the workplace on physical function and work-related outcomes among desk-based workers: a randomized controlled trial. *Journal of Occupational and Environmental Medicine*. 2018; 60(11):1005-1014.

<https://doi.org/10.1097/JOM.0000000000001408>

Abstract: OBJECTIVE: The aim of this study was to assess the effectiveness of a workplace leg-strengthening program on self-reported function, physical capacity, and work-related outcomes among desk-based workers. METHODS: Forty-three desk-based workers were randomized to a 12-week exercise program or no exercise control. The primary outcome was change in self-reported physical function on the Lower Extremity Functional Scale (LEFS) from baseline to follow-up. Secondary outcomes were physical capacity (mobility, strength), self-reported outcomes (pain, depressive symptoms), and work-related outcomes (resilience, work ability). RESULTS: The exercise group showed greater improvements in LEFS and mobility. No significant between-group differences existed in knee strength or remaining self-reported and work-related outcomes. CONCLUSION: Workplace implemented leg-strengthening exercises are effective at improving self-reported and physical health outcomes of desk-based workers. Moving forward, occupational exercise interventions may be essential to enhance worker longevity among the aging, sedentary workforce

Pham B, Bagheri E, Rios P, Pourmasoumi A, Robson RC, Hwee Jet al. Improving the conduct of systematic reviews: a process mining perspective. *Journal of Clinical Epidemiology*. 2018; 103:101-111.

<https://doi.org/10.1016/j.jclinepi.2018.06.011>

Abstract: OBJECTIVES: To illustrate the use of process mining concepts, techniques, and tools to improve the systematic review process. STUDY DESIGN AND SETTING: We simulated review activities and step-specific methods in the process for systematic reviews conducted by one research team over 1 year to generate an event log of activities, with start/end dates, reviewer assignment by expertise, and person-hours worked. Process mining techniques were applied to the event log to "discover" process models, which allowed visual display, animation, or replay of the simulated review activities. Summary statistics were calculated for person-time and timelines. We also analyzed the social networks of team interactions. RESULTS: The 12 simulated reviews included an average of 3,831 titles/abstracts (range: 1,565-6,368) and 20 studies (6-42). The average review completion time was 463 days (range: 289-629) (881 person-hours [range: 243-1,752]). The average person-hours per activity were study selection 26%, data collection 24%, report preparation 23%, and meta-analysis 17%. Social network analyses showed the organizational interaction of team members, including how they worked together to complete review tasks

and to hand over tasks upon completion. CONCLUSION: Event log and process mining can be valuable tools for research teams interested in improving and modernizing the systematic review process

Pianta MJ, Makrai E, Verspoor KM, Cohn TA, and Downie LE. Crowdsourcing critical appraisal of research evidence (CrowdCARE) was found to be a valid approach to assessing clinical research quality. Journal of Clinical Epidemiology. 2018; 104:8-14.

<https://doi.org/10.1016/j.jclinepi.2018.07.015>

Abstract: OBJECTIVES: We developed a free, online tool (CrowdCARE: crowdcare.unimelb.edu.au) to crowdsource research critical appraisal. The aim was to examine the validity of this approach for assessing the methodological quality of systematic reviews. STUDY DESIGN AND SETTING: In this prospective, cross-sectional study, a sample of systematic reviews (N = 71), of heterogeneous quality, was critically appraised using the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) tool, in CrowdCARE, by five trained novice and two expert raters. After performing independent appraisals, experts resolved any disagreements by consensus (to produce an "expert consensus" rating, as the gold-standard approach). RESULTS: The expert consensus rating was within +/-1 (on an 11-point scale) of the individual expert ratings for 82% of studies and was within +/-1 of the mean novice rating for 79% of studies. There was a strong correlation ($r(2) = 0.89$, $P < 0.0001$) and very good concordance ($\kappa = 0.67$, 95% CI: 0.61-0.73) between the expert consensus rating and mean novice rating. CONCLUSION: Crowdsourcing can be used to assess the quality of systematic reviews. Novices can be trained to appraise systematic reviews and, on average, achieve a high degree of accuracy relative to experts. These proof-of-concept data demonstrate the merit of crowdsourcing, compared with current gold standards of appraisal, and the potential capacity for this approach to transform evidence-based practice worldwide by sharing the appraisal load

Sawhney G, Sinclair RR, Cox AR, Munc AH, and Sliter MT. One climate or many: examining the structural distinctiveness of safety, health, and stress prevention climate measures. Journal of Occupational and Environmental Medicine. 2018; 60(11):1015-1025.

<https://doi.org/10.1097/JOM.0000000000001413>

Abstract: OBJECTIVE: This study explores the structural distinctiveness of safety, health, and stress prevention climate scales and examines whether these measures predict safety, physical health, and mental health outcomes over time. METHODS: We obtained samples of university students, Amazon Mechanical Turk workers, and firefighters to assess the dimensionality of the three climate foci, and provide content, construct, and criterion validity of the three measures. RESULTS: Findings from our study suggest that the constructs of safety, health, and stress prevention climate are psychometrically distinct, as well as demonstrate content, construct, and criterion validity evidence. CONCLUSION:

This study provides preliminary evidence for integrating the constructs of safety, health, and stress prevention climate in the Total Worker Health framework for predicting safety-, health-, and stress-related outcomes

Shirali G, Shekari M, and Angali KA. Assessing reliability and validity of an instrument for measuring resilience safety culture in sociotechnical systems. Safety and Health at Work. 2018; 9(3):296-307.

<https://doi.org/10.1016/j.shaw.2017.07.010> [open access]

Abstract: Background: Safety culture, acting as the oil necessary in an efficient safety management system, has its own weaknesses in the current conceptualization and utilization in practice. As a new approach, resilience safety culture (RSC) has been proposed to reduce these weaknesses and improve safety culture; however, it requires a valid and reliable instrument to be measured. This study aimed at evaluating the reliability and validity of such an instrument in measuring the RSC in sociotechnical systems. **Methods:** The researchers designed an instrument based on resilience engineering principles and safety culture as the first instrument to measure the RSC. The RSC instrument was distributed among 354 staff members from 12 units of an anonymous petrochemical plant through hand delivery. Content validity, confirmatory, and exploratory factor analysis were used to examine the construct validity, and Cronbach alpha and test-retest were employed to examine the reliability of the instrument. **Results:** The results of the content validity index and content validity ratio were calculated as 0.97 and 0.83, respectively. The explanatory factor analysis showed 14 factors with 68.29% total variance and 0.88 Kaiser-Meyer-Olkin index. The results were also confirmed with confirmatory factor analysis (relative Chi-square = 2453.49, Root Mean Square Error of Approximation = 0.04). The reliability of the RSC instrument, as measured by internal consistency, was found to be satisfactory (Cronbach alpha = 0.94). The results of test-retest reliability was $r = 0.85$, $p < 0.001$. **Conclusion:** The results of the study suggest that the measure shows acceptable validity and reliability

Tamers SL, Goetzel R, Kelly KM, Luckhaupt S, Nigam J, Pronk NP et al. Research methodologies for Total Worker Health: proceedings from a workshop. Journal of Occupational and Environmental Medicine. 2018; 60(11):968-978.

<https://doi.org/10.1097/JOM.0000000000001404>

Abstract: **OBJECTIVE:** There is growing interest in the NIOSH Total Worker Health program, specifically in the process of designing and implementing safer, health-promoting work and workplaces. A Total Worker Health (TWH) Research Methodology Workshop was convened to discuss research methods and future needs. **METHODS:** Twenty-six experts in occupational safety and health and related fields reviewed and discussed current methodological and measurement issues and those showing promise. **RESULTS:** TWH intervention studies face the same challenges as other workplace intervention studies and some unique

ones. Examples are provided of different approaches and their applications to TWH intervention studies, and desired developments in the TWH literature. CONCLUSIONS: This report discusses and outlines principles important to building the TWH intervention research base. Rigorous, valid methodologic, and measurement approaches are needed for TWH intervention as well as for basic/etiologic, translational, and surveillance research

Yu Z, Lin HC, Smith TD, and Lohrmann DK. Association between workplace harassment and occupational injury among adult workers in the United States. Safety Science. 2018; 110(Part A):372-379.
<https://doi.org/10.1016/j.ssci.2018.04.029>

***IWH authored publications.**