Emerging Evidence Alert
August 2020

This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics. It provides a review of recent journal articles and relevant content related to Comcare's five research themes: Fostering Work Participation; Building Employer Capability; Adapting to the Future of Work; Guiding and Supporting Mental Health and Wellbeing; and Enabling Healthy and Safe Workplaces. Collated articles were published in July 2020 only.

Contents

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Creating mentally healthy workplaces in uncertain times

Research into the factors that help manage and support workplace mental health is nothing new. Insights and findings from around the world have helped shape workplace policies and preventative workplace interventions that are now at the forefront of navigating a COVID-safe transition for Australian workers and workplaces.

A systematic review and meta-analysis on the association between work-related psychosocial risk factors and stress-related mental disorders provides up-to-date insights into this important topic. The study identifies that the following workplace factors reduce the incidence of stress disorders for workers, which, in turn, may improve mentally healthy workplaces:

- effort-reward balance
- procedural and relational justice
- achievable job demands
- co-worker and supervisor support
- adequate emotional demands
- greater decision authority.

The research draws on data from over 73,000 workers from Belgium, Denmark, England, Finland, Japan, the Netherlands and Sweden.

Latest COVID-19 research: resilience and optimism

A new study from China on transitioning back to work during COVID-19 showed that worker resilience and optimism were two main protective factors for mental health and for workplace engagement. As such, building resilience and fostering optimism in the workplace may help create a more mentally healthy workplace and maintaining positive work attitudes in the face of adversity.

For more guidance about supporting others and responding to uncertainty during COVID-19 visit the Comcare website. For industry specific COVID-19 information visit the Safe Work Australia website.

Description of evidence levels definitions used in this review

1. **Level of Evidence** – Certain study designs are scientifically stronger at answering a question. The scoring hierarchy we provided is presented below.

Level of Evidence	Description
Level 1	Evidence from a systematic review or meta-analysis of relevant studies.
Level 2	Evidence from a randomised controlled trial
Level 3	Evidence from a controlled intervention trial without randomisation (i.e. quasi-experimental).
Level 4	Evidence from a case-control or cohort study.
Level 5	Evidence from a single case study, a case series, or qualitative study.
Level 6	Evidence from opinion pieces, reports of expert committees and/or from literature reviews (scoping or narrative).

2. **Relevance** – Research carried out in Australia or similar countries is most relevant to Australian readers.

Level	Description
A	Study conducted in Australia or the study has been conducted outside Australia but confounders unlikely to affect relevance
B	Study conducted outside Australia and confounders likely to affect generalisability

Fostering Work Participation

Return to Work

Socio-economic disparities and returning to work following an injury
Background: Traumatic injury is one of the main reasons for temporary and permanent occupational disability. The objective of this study was to define the role of socio-economic position on post-injury occupational absenteeism. **Methods:** This was a nationwide retrospective cohort study, based on linking The Israeli National Trauma Registry (INTR) and the National Insurance Institute (NII) databases. The study population included 44,740 injured workers (residents of Israel, aged 21-67, hospitalized between 2008 and 2013 and employed prior to injury as salaried workers). Logistic-regression models tested the probability of not returning to work (RTW). **Results:** The majority of the study population (61%) RTW within 1 month following the injury event. Income prior to injury was significantly associated with longer out of work stay, explaining 9% variance. A significant interaction (p value < 0.0001) was found between age and income on out of work stay more than 1 month, 1 year and 2 years. Logistic regression models of out of work stay were conducted separately for all age groups. Lower income was associated with greater chance for out of work stay for more than 1 month; and the gap between the lowest and highest income quartiles was greater among older workers (age 55+), where there was an elevenfold increase in probability of not RTW among casualties from the lowest vs. highest income quartile. In comparison to other population groups, Arabs were at greater odds of longer out of work stay following an injury. Among injured persons recognized by the NII as having occupational injuries, the odds for not RTW within a month, a year and 2 years were respectively 3.9, 2.5 and 2.2 times significantly greater in comparison to employees injured outside the workplace. **Conclusions:** This study identified population groups with a high probability of not RTW following an injury requiring hospitalization. Intervention programs for injured employees should promote early rehabilitation and aim to shorten out of work stay. These programs should be ethnically adapted and focus on underprivileged and disadvantaged populations.
Savitsky et al. 2020.

Predicting return to work after long-term sickness absence with subjective health complaints: a prospective cohort study
Background: Long-term sickness absence results in increased risks of permanent disability and a compromised quality of life. Return to work is an important factor in reducing these risks. Little is known about return to work factors for long-term sick-listed workers with subjective health complaints. The aim of this study was to evaluate prognostic factors for partial or full return to a paid job for at least 28 days for long-term sick-listed workers with subjective health complaints, and to compare these factors with those of workers with other disorders. **Methods:** Data from a prospective cohort study of 213 participants with subjective health complaints and 1.037 reference participants were used. The participants answered a questionnaire after 84 weeks of sickness absence. Return to work was measured after one and two years. Univariable logistic regression analyses were performed (P ≤ 0.157) for variables per domain with return to work (i.e. demographic, socio-economic and work-related, health-related, and self-perceived ability). Subsequently, multivariable logistic regression analyses with backward selection (P ≤ 0.157) were performed. Remaining factors were combined in a multivariable and final model (P ≤ 0.05). **Results:** Both for workers with subjective health complaints and for the reference group, non-health-related factors remained statistically significant in the final model. This included receiving a partial or complete work disability benefit (partial: OR 0.62, 95% CI 0.26-1.47 and OR 0.69, 95% CI 0.43-1.12; complete: OR 0.24, 95% CI 0.10-0.58 and OR 0.12, 95% CI 0.07-0.20) and having a positive self-perceived possibility for return to work (OR 1.06, 95% CI 1.01-1.11 and OR 1.08, 95% CI 1.05-1.11). **Conclusions:** Non-health-related factors seem to be more important than health-related factors in predicting return to work after long-term

sickness absence. Receiving a work disability benefit and having negative expectations for return to work seem to complicate return to work most for workers with subjective health complaints. With respect to return to work predictors, workers with subjective health complaints do not differ from the reference group.

Presenteeism and Absenteeism

From long-term sickness absence to disability retirement: diagnostic and occupational class differences within the working-age Finnish population

Background: It is well documented that sickness absence is strongly associated with disability retirement. A long-term sickness absence (LTSA) in particular increases the risk of disability retirement, but little is known about the variation of this risk across diagnostic causes. Further, as occupational classes differ in their diagnostic profiles, it is likely that the role of diagnosis in the pathway from LTSA to disability retirement varies between occupational classes. We examined how LTSA of different diagnostic causes predicts all-cause disability retirement and disability retirement due to the same diagnostic group or due to some other diagnostic group than that which caused the LTSA spell in different occupational classes. **Methods:** Cox proportional hazards models were used to analyse a 70% random sample of all employed Finns aged 25-62 Finns in 2006 (N = 1,458,288). Disability retirement was followed from 2007 to 2014. The risk of disability retirement was compared between occupational classes with at least one LTSA spell due to musculoskeletal diseases, mental disorders, respiratory diseases, or circulatory diseases and those who had no LTSA spells due to these diagnostic groups during 2005. **Results:** Those who had LTSA due to musculoskeletal diseases or mental disorders transferred more often to disability retirement due to same diagnostic group, whereas those who had LTSA due to respiratory or circulatory diseases transferred more often to disability retirement due to some other diagnostic group. The largest occupational class differences in all-cause disability retirement were found among those with LTSA due to mental disorders. For men, the hazard ratios (HR) varied from HR 5.70 (95% confidence interval (CI) 5.00-6.52) in upper non-manual employees to 2.70 (95% CI 2.50-2.92) in manual workers. For women, the corresponding HRs were 3.74 (95% CI 3.37-4.14) in upper non-manual employees and 2.32 (95% 2.17-2.50) in manual workers. **Conclusions:** The association between LTSA and disability retirement varies between diagnostic groups, and the strength of this association further depends on the person's occupational class and gender.

Psychosocial determinants predicting long-term sickness absence: a register-based cohort study

Background: This study assessed the psychosocial determinants as explanatory variables for the length of the work disability period. The aim was to estimate the predictive value of a selected set of psychosocial determinants from the Quickscan questionnaire for the length of the sick leave period. A comparison was also made with the most common biomedical determinant: diagnosis. **Methods:** In a cohort study of 4 981 insured Belgian patients, the length of the sick leave was calculated using Kaplan-Meier. Predictive psychosocial determinants were selected using backward conditional selection in Cox regression and using concordance index values (C-index) we compared the predictive value of the biomedical to the psychosocial model in a sample subset. **Results:** Fourteen psychosocial determinants were significantly (p<0.10) related to the length of the sick leave: health perception of the patient, physical workload, social support

management, social support colleagues, work-health interference, psychological distress, fear of colleagues' expectations, stressful life-events, autonomy, learning and development opportunities, job satisfaction, workload, work expectations and expectation to return to work. The C-index of this biopsychosocial model including gender, age and labour status was 0.80 (CI: 0.78; 0.81) (n=4 981). In the subset of 2 868 respondents with diagnostic information, the C-index for the same model was .73 (CI: 0.71; 0.76) compared with 0.63 (CI: 0.61; 0.65) for the biomedical model. **Conclusions:** A set of 14 psychosocial determinants showed good predictive capacity (C-index: 0.80). Also, in a subset of the sample, the selected determinants performed better compared with diagnostic information to predict long-term sick leave (>6 months).

Goorts et al. 2020.
Journal of Epidemiological and Community Health.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Disability; epidemiology; health services; public health.
Evidence Level: 4A
Link: https://jech.bmj.com/content/early/2020/07/13/jech-2020-214181.long

Sickness absence among privately employed white-collar workers: A total population study in Sweden
Background: Knowledge about sickness absence (SA) and disability pension (DP) among privately employed white-collar workers is very limited. **Aims:** This study aimed to explore SA and DP among privately employed white-collar women and men using different measures of SA to investigate differences by branch of industry, and to analyse the association between sociodemographic factors and SA. **Methods:** This was a population-based study of all 1,283,516 (47% women) privately employed white-collar workers in Sweden in 2012, using register data linked at the individual level. Several different measures of SA and DP were used. Logistic regression was used to investigate associations of sociodemographic factors with SA. **Results:** More women than men had SA (10.9% women vs. 4.5% men) and DP (1.8% women vs. 0.6% men). While women had a higher risk of SA than men and had more SA days per employed person, they did not have more SA days per person with SA than men. The risk of SA was higher for women (odds ratio (OR)=2.54 (95% confidence interval (CI) 2.51-2.58)), older individuals (OR age 18-24 years=0.58 (95% CI 0.56-0.60); age 55-64 years OR=1.43 (95% CI 1.40-1.46) compared to age 45-54 years), living in medium-sized towns (OR=1.05 (95% CI 1.03-1.06)) or small towns/rural areas (OR=1.13 (95% CI 1.11-1.15)), with shorter education than college/university (OR compulsory only=1.64 (95% CI 1.59-1.69); OR high school=1.38 (95% CI 1.36-1.40)), born outside the EU25 (OR=1.23 (95% CI 1.20-1.27)) and singles with children at home (OR=1.33 (95% CI 1.30-1.36)). **Conclusions:** SA and DP among privately employed white-collar workers were lower than in the general population. SA prevalence, length and risk varied by branch of industry, sex and other sociodemographic factors, however, depending on the SA measure used.

Farrants et al. 2020.
Scandinavian Journal of Public Health.
User License: Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/)
Keywords: Sick leave; disability pension; private sector; sickness absence; white-collar workers.
Evidence Level: 4B
Link: https://europepmc.org/article/med/32650706

Building Employer Capability

Job Design

Comparison of job quality indices affecting work-life balance in South Korea according to employee gender
Maintaining a healthy work-life balance is important for both males and females. Nevertheless, gender segregation still exists in labor markets in South Korea. Therefore, this study aimed to investigate differences in occupational characteristics, job quality indices, and work-life balance between male and female employees. This study was a secondary analysis of the data collected through the fifth Korean Working Conditions Survey in South Korea. Generalized ordinal logistic regression analysis was carried out

to investigate the associations between job quality indices and work-life balance of employees by gender. The job quality indices were different according to gender. Male employees were mainly affected by working time quality and work intensity, while female employees were affected by both these factors and by the physical environment. Therefore, strategies differentiated by gender are necessary to improve work-life balance. In particular, more careful attention should be paid to female workers' physical environment.

Choi et al. 2020.
International Journal of Environmental Research and Public Health, vol. 17, no. 13.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Employee; gender; job quality; work–life balance.
Evidence Level: 5B
Link: https://www.mdpi.com/1660-4601/17/13/4819

Practical judgment of workload based on physical activity, work conditions, and worker's age in construction site

It is important for construction companies to sustain a productive workforce without sacrificing its health and safety. This study aims to develop a practical judgement method to estimate the workload risk of individual construction workers. Based on studies, we developed a workload model comprising a hygrothermal environment, behavioral information, and the physical characteristics of workers. The construction workers' heart rate and physical activity were measured using the data collected from a wearable device equipped with a biosensor and an acceleration sensor. This study is the first report to use worker physical activity, age, and the wet bulb globe temperature (WBGT) to determine a worker's physical workload. The accuracy of this health risk judgment result was 89.2%, indicating that it is possible to easily judge the health risk of workers even in an environment where it is difficult to measure the subject in advance. The proposed model and its findings can aid in monitoring the health impacts of working conditions during construction activities, and thereby contribute toward determining workers' health damage. However, the sampled construction workers are 12 workers, further studies in other working conditions are required to accumulate more evidence and assure the accuracy of the models.

Hashiguchi et al. 2020.
Sensors (Basel), vol. 20, no. 13.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Construction hazards; heart rate reserve; wet bulb globe temperature; worker safety; workload estimation.
Evidence Level: 5B
Link: https://www.mdpi.com/1424-8220/20/13/3786

Shift Work

A high-protein meal during a night shift does not improve postprandial metabolic response the following breakfast: A randomized crossover study with night workers

The aim of this study was to compare the acute effect of a high-protein/moderate carbohydrate (HP-MCHO) versus low-protein/high-carbohydrate (LP-HCHO) meal served at night on the postprandial metabolic response of male night workers the following breakfast. A randomized crossover study was performed with 14 male night workers (40.9 ± 8.9 years old; 29.1 ± 5.3 kg/m2). Participants underwent two different isocaloric dietary conditions at 1:00 h of the night shift: HP-MCHO (45 en% carbohydrate, 35 en% protein and 20 en% fat) and LP-HCHO (65 en% carbohydrate, 15 en% protein and 20 en% fat). Postprandial capillary glucose levels were determined immediately before the intake of the test meal and 30, 60, 90 and 120 min after the end of the meal. At the end of the work shift (6:30 h), participants received a standard breakfast and postprandial levels of glucose, insulin and triglycerides were determined immediately before and then every 30 min for 2 h (30, 60, 90 and 120 min). Higher values of capillary glucose were found after the LP-HCHO condition compared to the HP-MCHO condition (area under the curve (AUC) = 119.46 ± 1.49 mg/dL × min and 102.95 ± 1.28 mg/dL × min, respectively; p < 0.001). For the metabolic response to standard breakfast as the following meal, no significant differences in glucose, insulin, triglyceride, and HOMA-IR levels were found between interventions. A night meal with a higher percentage of protein and a

lower percentage of carbohydrate led to minor postprandial glucose levels during the night shift but exerted no effect on the metabolic response of the following meal.

A longitudinal study on the association between quick returns and occupational accidents
Objective: This study aimed to investigate how change in the number of quick returns [(QR) <11 hours between consecutive shifts] longitudinally is associated with risk of occupational accidents among nurses. **Methods:** Two-year follow-up data from 1692 nurses participating in the Survey of Shiftwork, Sleep and Health among Norwegian nurses (SUSSH) (mean age 40.2, standard deviation 8.3 years, 91% female) were used. Negative binomial regression analyses were conducted to investigate the association between changes in the number of QR after two years and occupational accidents, controlling for demographics, work factors, and occupational accidents at baseline. **Results:** An increase from having no or a moderate number of QR (1-34 per year) from baseline to the two-year follow-up assessment was associated with an increased risk of occupational accidents, compared to experiencing no change in the number of QR. Those with a moderate number of QR at baseline who experienced an increase after two years had an increased risk of causing harm to patients/others [incident rate ratio (IRR) 8.49, 95% confidence interval (CI) 2.79-25.87] and equipment at work (IRR 2.89, 95% CI 1.13-7.42). Those who had many QR (>34 per year) at baseline but experienced a reduction after two years had a reduced risk of causing harm to themselves (IRR 0.35, 95% CI 0.16-0.73) and patients/others (IRR 0.27, 95% CI 0.12-0.59). **Conclusion:** A fairly consistent pattern was demonstrated in which changes in the number of QR over the two-year follow-up period was associated with a corresponding change in the risk of occupational accidents.

Cognitive behavioural therapy interventions for insomnia among shift workers: RCT in an occupational health setting
Introduction: The aim of the study was to compare the effectiveness of cognitive behavioural therapy interventions for insomnia (CBT-I) to that of a sleep hygiene intervention in a randomized controlled design among shift workers. We also studied whether the features of shift work disorder (SWD) affected the results. **Methods:** A total of 83 shift workers with insomnia disorder were partially randomized into a group-based CBT-I, self-help CBT-I, or sleep hygiene control intervention. The outcomes were assessed before and after the interventions and at 6-month follow-up using questionnaires, a sleep diary, and actigraphy. **Results:** Perceived severity of insomnia, sleep-related dysfunctional beliefs, burnout symptoms, restedness, recovery after a shift, and actigraphy-based total sleep time improved after the interventions, but we found no significant differences between the interventions. Mood symptoms improved only among the group-based CBT-I intervention participants. Non-SWD participants had more mental diseases and symptoms, used more sleep-promoting medication, and had pronounced insomnia severity and more dysfunctional beliefs than those with SWD. After the interventions, non-SWD participants showed more prominent improvements than those with SWD. **Conclusions:** Our results showed no significant differences between the sleep improvements of the shift workers in the CBT-I interventions and of those in the sleep hygiene control intervention. Alleviation of mood symptoms seemed to be the main added value of the group-based CBT-I intervention compared to the control intervention. The clinical condition of the non-SWD participants was more severe and these participants benefitted more from the interventions than the SWD participants did.

Adapting to the Future of Work

Technology

The influence of proprioceptive training with the use of virtual reality on postural stability of workers working at height
The aim of the study was to assess the impact of proprioceptive training with the use of virtual reality (VR) on the level of postural stability of high-altitude workers. Twenty-one men working at height were randomly assigned to the experimental group (EG) with training (n = 10) and control group (CG) without training (n = 11). Path length of the displacement of the center of pressure (COP) signal and its components in the anteroposterior and medial-lateral directions were measured with use of an AccuGaitTM force plate before and after intervention (6 weeks, 2 sessions × 30 min a week). Tests were performed at two different platform heights, with or without eyes open and with or without a dual task. Two-way ANOVA revealed statistically significant interaction effects for low-high threat, eyes open-eyes closed, and single task-dual task. Post-training values of average COP length were significantly lower in the EG than before training for all analyzed parameters. Based on these results, it can be concluded that the use of proprioceptive training with use of VR can support, or even replace, traditional methods of balance training.

Work Environment

Does reduced employment protection increase the employment disadvantage of workers with low education and poorer health?
Background: Declines in employment protection may have disproportionate effects on employment opportunities of workers with low education and poorer health. This study investigates the impact of changes in employment protection levels on employment rates according to education and health in 23 European countries. **Methods:** Data were taken from the 4-year rotating panel European Union Statistics on Income and Living Conditions study. Employed participants aged 29-59 years (n = 334 999) were followed for 1 year over an 11-year period, from 2003 up to 2014. A logistic regression model with country and period fixed effects was used to estimate the association between changes in the Organisation for Economic Co-operation and Development (OECD) employment protection index and labour market outcomes, incorporating interaction terms with education and health. **Results:** 15 of the 23 countries saw their level of employment protection decline between 2003 and 2014. Reduced employment protection of temporary workers increased odds of early retirement (OR 6.29, 95% CI 3.17 to 12.48) and unemployment (OR 1.37, 95% CI 1.07 to 1.76). Reduced employment protection of permanent workers increased odds of early retirement more among workers in poor health (OR 4.46, 95% CI 2.26 to 8.78) than among workers in good health (OR 2.58, 95% CI 1.30 to 5.10). The impact of reduced employment protection of temporary workers on unemployment was stronger among lower-educated workers (OR 1.47, 95% CI 1.13 to 1.90) than among higher-educated workers (OR 1.21, 95% CI 0.95 to 1.54). **Conclusion:** Reduced employment protection increased the odds of early exit from paid employment, especially among workers with lower

education and poorer health. Employment protection laws may help reduce the employment disadvantage of workers with low education and poorer health.

Schuring et al. 2020.
Journal of Epidemiological and Community Health.

Guiding and Supporting Mental Health and Wellbeing

Mental Health

Work-related post-traumatic stress disorder: report of five cases

Post-traumatic stress disorder (PTSD) may arise after events involving a risk to physical integrity or to life, one's own or that of others. It is characterized by intrusive symptoms, avoidance behaviors, and hyper-excitability. Outside certain categories (e.g., military and police), the syndrome is rarely described in the occupational setting. We report here five unusual cases of work-related PTSD, diagnosed with an interdisciplinary protocol (occupational health visit, psychiatric interview, psychological counselling and testing): (1) a 51 yr-old woman who had undergone three armed robbery attempts while working in a peripheral post office; (2) a 53 yr-old maintenance workman who had suffered serious burns on the job; (3) a 33 yr-old beauty center receptionist after sexual harassment and stalking by her male employer; (4) a 57 yr-old male psychiatrist assaulted by a psychotic outpatient; (5) a 40 yr-old woman, sales manager in a shoe store, after physical aggression by a thief. All patients required psychiatric help and pharmacological treatment, with difficulty of varying degrees in resuming work. We conclude that PTSD can develop even in professional categories generally considered to be at low risk. In such cases, a correct interdisciplinary diagnostic approach is fundamental for addressing therapy and for medico-legal actions.

Candura et al. 2020.
Industrial Health.

The effect of occupational stress on depression and insomnia: a cross-sectional study among employees in a Ghanaian telecommunication company

Background: Depression and insomnia are major psychiatric conditions predicted by occupational stress. However, the influence of occupational stress on these two conditions is under-explored in telecommunication companies, especially in Africa. This research was conducted to assess occupational stress in a Ghanaian telecommunication company and its effect on depression and insomnia. **Methods:** An analytical cross-sectional study was conducted among employees at a telecommunication company in Accra. Structured self-administered questionnaires were used in collecting data from 235 respondents using simple random sampling. The Chi-square test of independence and Wilcoxon Rank-Sum test were employed to assess the significance of associations with subsequent sensitivity analysis using Multiple logistic, Poisson and Probit regression models. Occupational stress was matched on four variables: age of the workers, marital status, responsibility for dependents and work experience, to improve on the estimation of its impact on symptomatic depression and insomnia using the coarsened exact matching procedure. **Results:** More males (52.8%) than females participated in this study. The age range for study participants was 20-49 years with a mean of 30.8 ± 6.9 years. The prevalence of excessive occupational stress reported by the employees was 32.8% (95% CI = 26.7-38.8). More than half of respondents (51%) reported depressive symptoms in the past week and only a few (6%) reported being diagnosed with

insomnia in the past year. Age, responsibility for dependents and work experience were the only background characteristics that were significantly associated with excessive occupational stress. After controlling for background characteristics, the estimated risk of reporting symptoms of depression among employees who reported excessive stress from work was only 5% higher [ARR; 95% CI = 1.05 (0.94-1.17)] whereas it was 2.58 times the risk of reporting insomnia [ARR; 95% CI = 2.58(0.83-8.00)] compared to those who did not report excessive stress from their jobs. The relative risk reduced to 2.46[ARR; 95% CI = 2.46(0.77-7.87)] and 1.03[ARR; 95% CI = 1.03(0.91-1.17)] for insomnia and depression respectively after employing Poisson regression with CEM. **Conclusion:** The study found a higher risk of insomnia among employees who reported excessive occupational stress compared to those who did not. However, this study did not find a statistically significant relationship between depression and occupational stress.
Kploanyi et al. 2020.

Associations of occupational stress with job burn-out, depression and hypertension in coal miners of Xinjiang, China: a cross-sectional study
Objective: Strategies and measures for fighting occupational stress in China are inadequate. This study aimed to determine the level of occupational stress in coal miners and to assess the associations between occupational stress and job burn-out, depression and hypertension. The results could provide clues for preventive measures and strategies to improve the psychological well-being of this population. **Design:** Cross-sectional study. **Setting:** Xinjiang Coal Administration Bureau. **Participants:** Four coal mines were selected randomly (computer-generated random number-based selection process) from the 21 coal mines of Xinjiang, and all miners with >1 year of employment were screened for participation. **Primary and secondary outcome measures:** A general demographic questionnaire, the Self-rating Depression Scale, the Effort-Reward Imbalance (ERI) model and the Maslach Burn-out Inventory. **Results:** A total of 1400 questionnaires were collected, including 1334 (95.3%) valid questionnaires. This survey indicated that 1107 (83.0%) participants with an ERI score >1 (high occupational stress) and 227 (12.8%) had ERI ≤1. Severe depression was found in 21.7% of the participants. Job burn-out was positively correlated with occupational stress, which was, in turn, associated with depression. Multivariable linear regression analysis showed that depression (β=0.006, p=0.012), sex (β=0.358, p<0.001) and occupational stress (β=0.702, p<0.001) were independently associated with job burn-out. Working years (β=-0.086, p=0.015) and job burn-out (β=0.022, p<0.001) were directly associated with depression. **Conclusion:** This study highlights that occupational stress may affect job burn-out, depression symptoms and hypertension. A higher degree of occupational stress was associated with poorer mental status and hypertension.
Yong et al. 2020.

Work-related psychosocial risk factors for stress-related mental disorders: an updated systematic review and meta-analysis
Objective: The objective was to conduct an update of a previously published review and meta-analysis on the association between work-related psychosocial risk factors and stress-related mental disorders (SRD). **Design:** Systematic review and meta-analysis. **Data sources:** Medline, Embase and PsycINFO were searched for articles published between 2008 and 12 August 2019 and references of a systematic review performed for the period before 2008 were included. Primary prospective studies were included when outcome data were described in terms of SRD assessment or a dichotomous outcome, based on a validated questionnaire, and at least two levels of work-related exposure were reported (exposed vs less or non-exposed). We used GRADE to assess the evidence for the associations between risk factors and the onset of

SRD. **Results:** Seventeen studies met the inclusion criteria. In total, a population of 73 874 workers from Belgium, Denmark, England, Finland, Japan, the Netherlands and Sweden were included in the meta-analysis of 14 prospective cohort studies. This meta-analysis revealed moderate evidence for associations between SRD and effort reward imbalance (OR=1.9, 95% CI 1.70 to 2.15), high job demands (OR=1.6, 95% CI 1.41 to 1.72), organisational justice (ORs=1.6 to 1.7, CIs 1.44 to 1.86), social support (ORs=1.3 to 1.4, CIs 1.16 to 1.69), high emotional demands (OR=1.6, 95% CI 1.35 to 1.84) and decision authority (OR=1.3, CI 1.20 to 1.49). No significant or inconsistent associations were found for job insecurity, decision latitude, skill discretion and bullying. **Conclusion:** Moderate evidence was found that work-related psychosocial risk factors are associated with a higher risk of SRD. Effort-reward imbalance, low organisational justice and high job demands exhibited the largest increased risk of SRD, varying from 60% to 90%.

Prospective study on the association between adherence to healthy lifestyles and depressive symptoms among Japanese employees: The Furukawa Nutrition and Health Study

Background: While a growing body of research suggests a protective role of healthy lifestyle against depression, evidence from prospective studies is scarce. We constructed a healthy lifestyle index (HLI) and examined its prospective association with depressive symptoms in a Japanese working population.
Methods: Participants were 917 employees (19-68 years old) who were free from depressive symptoms at baseline in 2012-2013 and attended the 3-year follow-up survey. The HLI (range: 0-7 points) was constructed by assigning 1 point to each healthy lifestyle factor, namely, (1) normal body mass index (18.5-24.9 kg/m2), (2) non-smoking, (3) no or moderate alcohol intake (≤23 g ethanol/day), (4) adequate physical activity (≥7.5 metabolic equivalent-hours/week), (5) high vegetable intake (≥350 g/day), (6) high fruit intake (≥200 g/day), and (7) adequate sleep duration (6-8.9 hours/day), which was categorized into three groups (low: 0-2 points; middle: 3-4 points; and high: 5-7 points). Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale. **Results:** A total of 155 incident cases (17.0%) of depressive symptoms were identified at the follow-up survey. Compared with the low HLI group, multivariable-adjusted odds ratios of depressive symptoms were 0.74 (95% confidence interval, 0.48-1.15) and 0.55 (95% confidence interval, 0.31-0.99) for the middle and high HLI groups, respectively (P-trend = 0.041). **Conclusion:** The present study suggests the importance of adherence to multiple healthy lifestyle factors in prevention of depressive symptoms.

Effect of work-related events on depressive symptoms in Japanese employees: a web-based longitudinal study

While a number of work-related events have been proposed as risk factors for depression, a majority of studies have focused only on a few events in a single study. Therefore, we conducted a web-based longitudinal study to comprehensively investigate the impact of various work-related events on depressive symptoms. Ten thousand Japanese workers representing the Japanese working population were recruited online and questioned on their experiences of 36 work-related events in the past year. Their depressive symptoms were also assessed based on the Center for Epidemiologic Studies Depression Scale. Two years later, 3,098 participants responded to a follow-up study. By excluding 1,030 participants who were classified as being depressed in the baseline survey, data of 2,068 participants were analyzed. Odds ratios (OR) were calculated using multivariate logistic regression to assess the effect of work-related events on depressive symptoms. Eighteen events were found to be risk factors and were sorted into four types as

follows: experience of an accident or disaster (OR: 4.78-7.67), excessive responsibility (OR: 3.01-3.62), drastic change in workstyle or workload (OR: 2.38-3.08), and interpersonal conflict (OR: 2.41-11.16). The current results, including magnitude relationship of ORs, should be utilized for promoting psychosocially healthy work environment.

Nishimura et al. 2020.
Industry Health.
User License: Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)   (https://creativecommons.org/licenses/by-nc-nd/4.0/)
Keywords: Depression; industrial accident compensation insurance; longitudinal study; mental health; work-related events.
Evidence Level: 4B
Link: https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub_2020-0058/_article

What could influence workers' decisions to disclose a mental illness at work?
Background: Stigma can be a barrier for workers experiencing a mental illness to access accommodations at work. However, work accommodations may be necessary to maintain a worker's ability to work. Therefore, it may be important to develop effective interventions to address workplace stigma. **Objective:** To determine (1) what proportion of workers would probably disclose their mental health issue to their manager, (2) what are the motivating factors for the decision of whether or not to disclose, and (3) what would potentially change the disclosure decision? **Methods:** A link to a Web-based questionnaire was sent to a nationally representative sample of 1671 Dutch adults over 18 years of age. The response rate was 74%. We focused on the 892 respondents who indicated they were either employed for pay or looking for employment, not in management positions, and never experienced a mental health issue. This group comprised 73% of the total sample. They were asked if they would disclose their mental health issue to their manager. For what reasons would they disclose/not disclose the issue? And, what could change their decision? **Results:** We found that almost 75% of workers would disclose to their managers. The perceived relationship with their managers and feelings of responsibility to their workplaces were important contributors to the decision. A large minority of workers would not tell, preferring to deal with their issues alone. In addition, a significant proportion of workers would choose not to disclose fearing negative consequences. **Conclusion:** Our results indicate that the majority of these Dutch workers would disclose a mental health issue to their managers. The relationship with the manager plays a central role. The advice from a trusted individual and the experiences of colleagues are also significant factors in the disclosure decision.

Dewa et al. 2020.
International Journal of Occupational and Environmental Medicine, vol. 11, no. 3.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Disclosure; mental disorders; mental health; occupational groups; social stigma; workplaces.
Evidence Level: 5A
Link: https://www.theijoem.com/ijoem/index.php/ijoem/article/view/1870

Bullying and Harassment

Multidimensional gender discrimination in workplace and depressive symptoms
Background: Discrimination is associated with depressive symptoms and other negative health effects, but little is known about the mental health risks of workplace gender discrimination. We aimed to investigate the association of workplace gender discrimination and depressive symptoms among employed women in South Korea. **Methods:** The 6th wave (2016) survey datasets of the Korean Longitudinal Survey of Women and Family (KLoWF) were analyzed for 2,339 respondents who are identified as wage workers. Depressive symptoms were evaluated by the short-form (10-item) Center for Epidemiological Studies-Depression scale. Association of workplace gender discrimination and depressive symptoms was assessed using multivariate logistic regression, adjusted for potential confounding variables including age, income satisfaction, education level, marital status, and currently diagnosed disease. We then measured the age effect using age stratification multivariate logistic regression model. **Results:** Women who experienced gender

discrimination at workplace had higher odds of depressive symptoms regardless of the type of the discrimination including hiring, promotion, work assignments, paid wages, and firing. These associations were consistent in younger women below 40 years of age in regard to hiring, promotion, paid wages and firing, whereas inconsistent among older women above 40 years of age. **Limitations:** We did not investigate the effect of workplace gender discrimination on depressive symptoms in a longitudinal manner.
Conclusions: Workplace gender discrimination was found to be significantly associated with depressive symptoms after adjustment for socio-demographic factors. Further, women under 40 years of age were especially vulnerable to workplace gender discrimination.
Kim et al. 2020.
PLoS One, vol. 15, no. 7.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Gender; discrimination; work; depression; workplace; depressive symptoms.
Evidence Level: 4B
Link: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0234415

Employment and Unemployment

Testing a self-compassion intervention among job seekers: Self-compassion beneficially impacts affect through reduced self-criticism
Job search is associated with various obstacles and difficulties that can elicit negative emotions and undermine positive emotions. Having self-compassion may benefit job seekers' well-being by stimulating more balanced emotional responses to negative job search experiences. In an intervention study we examined whether state self-compassion can be increased among job seekers through writing exercises in which job seekers are instructed to reflect with self-compassion on their negative job search experiences. We further examined whether the self-compassion intervention benefited job seekers' affective responses, through reducing self-criticism. We designed a between-participants field experiment with two conditions (i.e., self-compassion vs. control) and three measurement times 1 week apart: a baseline questionnaire, the intervention with a second questionnaire, and a follow-up questionnaire (N = 180). Results show that the self-compassion writing exercise increased job seekers' state self-compassion, which in turn related to their affective responses to job search. Specifically, their negative deactivating affect (e.g., sadness) was lower and their positive deactivating affect (e.g., calmness) was higher immediately after the self-compassion writing exercise than after reflecting freely (i.e., the control condition). The effects on job seekers' affect were partially mediated by reduced self-criticism.
Kreemers et al. 2020.
Frontiers of Psychology.
User License: Creative Commons Attribution (CC BY 4.0**) (**https://creativecommons.org/licenses/by/4.0/**)**
Keywords: Intervention; job search; negative affect; positive affect; self-compassion; self-criticism.
Evidence Level: 5A
Link: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01371/full

Associations of social and psychological resources with different facets of chronic stress: A study with employed and unemployed adolescents
Adolescents navigate many psychosocial changes. A critical transition in adolescence is the one from school to work life. Both taking the first steps in work life and the failure to achieve this transition and being unemployed can engender elevated levels of stress during adolescence. Stress, especially when experienced chronically, is an important risk factor for mental health problems. Social and psychological resources may mitigate the experience of chronic stress. This study explored associations of social and family support, self-esteem, and self-efficacy with different dimensions of chronic stress in a sample of 1405 employed and unemployed adolescents (M(age) = 17.84, SD = 1.63, range: 14.05-26.12) in Switzerland. Unemployed adolescents showed higher stress levels overall. Higher levels of social and psychological resources were generally linked to lower stress levels. Social support and self-esteem predicted stress levels most consistently and strongly. On several stress dimensions, the association between higher self-esteem and lower stress levels was more pronounced in employed youth whereas the

association between higher social support and lower stress levels was stronger in unemployed youth. Our findings provide insights on the differential associations of social and psychological resources with various facets of chronic stress in the context of employment and unemployment during adolescence.

Chronic diseases and multimorbidity among unemployed and employed persons in the Netherlands: a register-based cross-sectional study

Objectives: The first objective of this study was to describe the age-specific prevalence of chronic diseases and multimorbidity among unemployed and employed persons. The second objective was to examine associations of employment status and sociodemographic characteristics with chronic diseases and multimorbidity. **Design:** Data linkage of cross-sectional nationwide registries on employment status, medication use and sociodemographic characteristics in 2016 was applied. **Setting:** Register-based data covering residents in the Netherlands. **Participants:** 5 074 227 persons aged 18-65 years were selected with information on employment status, medication use and sociodemographic characteristics. **Outcome measures:** Multiple logistic regression analysis and descriptive statistics were performed to examine associations of employment and sociodemographic characteristics with the prevalence of chronic diseases and multimorbidity. The age-specific prevalence of six common chronic diseases was described, and Venn diagrams were applied for multimorbidity among unemployed and employed persons. **Results:** Unemployed persons had a higher prevalence of psychological disorders (18.3% vs 5.4%), cardiovascular diseases (20.1% vs 8.9%), inflammatory diseases (24.5% vs 15.8%) and respiratory diseases (11.7% vs 6.5%) than employed persons. Unemployed persons were more likely to have one (OR 1.30 (1.29-1.31)), two (OR 1.74 (1.73-1.76)) and at least three chronic diseases (OR 2.59 (2.56-2.61)) than employed persons. Among unemployed persons, psychological disorders and inflammatory conditions increased with age but declined from middle age onwards, whereas a slight increase was observed among employed persons. Older persons, women, lower educated persons and migrants were more likely to have chronic diseases. **Conclusion:** Large differences exist in the prevalence of chronic diseases and multimorbidity among unemployed and employed persons. The age-specific prevalence follows a different pattern among employed and unemployed persons, with a relatively high prevalence of psychological disorders and inflammatory conditions among middle-aged unemployed persons. Policy measures should focus more on promoting employment among unemployed persons with chronic diseases.

Psychosocial Issues – Risk Factors

Canadian public safety personnel and occupational stressors: How PSP interpret stressors on duty
Canadian public safety personnel (e.g., correctional workers, firefighters) experience potential stressors as a function of their occupation. Occupational stressors can include organizational (e.g., job context) and operational (e.g., job content) elements. Operational stressors (e.g., exposures to potentially psychologically traumatic events) may be inevitable, but opportunities may exist to mitigate other occupational stressors for public safety personnel. Research exploring the diverse forms of stress among public safety personnel remains sparse. In our current qualitative study we provide insights into how public safety personnel interpret occupational stressors. We use a semi-grounded thematic approach to analyze what public safety personnel reported when asked to further comment on occupational stress or their

work experiences in two open-ended comment fields of an online survey. We provide a more comprehensive understanding of how public safety personnel experience occupational stress and the stressors that are unique to their occupations. Beyond known operational stressors, our respondents (n = 1238; n = 828) reported substantial difficulties with organizational (interpersonal work relationship dynamics; workload distribution, resources, and administrative obligations) and operational (vigilance, work location, interacting with the public) stressors. Some operational stressors are inevitable, but other occupational stressors can be mitigated to better support our public safety personnel.

Effort-reward imbalance at work and weight changes in a nationwide cohort of workers in Denmark
Objective: To investigate the relation between effort-reward imbalance (ERI) at work and subsequent weight changes. **Methods:** We included participants from a population-based cohort of workers in Denmark (mean age = 47 years, 54% women) with two (n = 9005) or three repeated measurements (n = 5710). We investigated the association between (a) ERI (i.e. the mismatch between high efforts spent and low rewards received at work) at baseline and weight changes after a 2-year follow-up (defined as ≥5% increase or decrease in body mass index (BMI) vs stable), and (b) onset and remission of ERI and subsequent changes in BMI. Using multinomial logistic regression we calculated risk ratios (RR) and 95% confidence intervals (CI), adjusted for sex, age, education, cohabitation, migration background, and follow-up time. **Results:** After 2 years, 15% had an increase and 13% a decrease in BMI. Exposure to ERI at baseline yielded RRs of 1.09 (95% CI: 0.95-1.25) and 1.04 (95% CI: 0.90-1.20) for the increase and decrease in BMI, respectively. There were no differences between sex and baseline BMI in stratified analyses. The onset of ERI yielded RRs of 1.04 (95% CI: 0.82-1.31) and 1.15 (95% CI: 0.84-1.57) for subsequent increase and decrease in BMI. The RRs for the remission of ERI and subsequent increase and decrease in BMI were 0.92 (95% CI: 0.71-1.20) and 0.78 (95% CI: 0.53-1.13), respectively. Of the ERI components, high rewards were associated with a lower risk of BMI increase. **Conclusion:** ERI was not a risk factor for weight changes. Future studies may investigate whether this result is generalizable to other occupational cohorts and settings.

Is narcissism associated with heavy work investment? The moderating role of workload in the relationship between narcissism, workaholism, and work engagement
This study aimed to investigate the association between narcissism and two forms of heavy work investment, namely, workaholism and work engagement. More specifically, it was hypothesized that narcissism is positively associated with both workaholism and work engagement, with workload moderating these relationships, which are expected to be stronger when the workload is high. Overall, 217 workers completed a self-report questionnaire, and the hypothesized relationships were tested using moderated multiple regression. Results partially supported our predictions. Narcissism was positively associated with workaholism and its dimensions of working excessively and working compulsively only in individuals facing a high workload. Furthermore, narcissism was positively associated with work engagement and its dimensions of vigor and dedication (but no absorption) in employees with average levels of workload. Finally, the workload exacerbated the relationship between narcissism and work engagement and its dimensions so that these associations were stronger when the workload was high.

Overall, our study suggested that in a work environment characterized by moderate levels of demand, individuals with strong narcissistic components might inherently feel energetic and dedicated (i.e., engaged) at work. Differently, in a demanding work environment, workers with high narcissism might experience higher work engagement, but they could also be at risk of workaholism.

Enabling Healthy and Safe Workplaces

Health and Wellbeing

Designing a participatory Total Worker Health(®) organizational intervention for commercial construction subcontractors to improve worker safety, health, and well-being: The "ARM for Subs" trial
Background: Evidence supports organizational interventions as being effective for improving worker safety, health and well-being; however, there is a paucity of evidence-based interventions for subcontracting companies in commercial construction. **Methods:** A theory-driven approach supplemented by formative research through key stakeholder interviews and focus groups and an iterative vetting process with stakeholders, resulted in the development of an intervention for subcontractors in the commercial construction industry. We piloted the intervention in one subcontracting commercial construction company. We used these findings to adapt and finalize the intervention design to be tested in a future large-scale trial. **Results:** There were several key findings from the formative research, including challenges faced by companies and assets that should be considered in the intervention design. This resulted in a communication infrastructure company-based, continual improvement, participatory intervention design, consisting of a needs assessment and report, committee-led prioritization, action planning and implementation, and worker communication/feedback cycle. The pilot contributed to the final intervention design with modifications made with respect to timing, implementation support, capacity building, adaptability and sustainability. **Conclusions:** The use of a theory-driven participatory approach to developing an integrated organizational intervention for commercial construction subcontracting companies was important and necessary. It allowed us to consider the empirical evidence and relevant theories and tailor these to meet the needs of our target population. This study gives pragmatic insight into the early development of a complex intervention, with practical experience of how we adapted our intervention at each stage. This intervention will be tested in a future randomized trial.

Work-life balance and self-reported health among working adults in Europe: a gender and welfare state regime comparative analysis
Background: The pressing demands of work over the years have had a significant constraint on the family and social life of working adults. Moreover, failure to achieve a 'balance' between these domains of life may have an adverse effect on their health. This study investigated the relationship between work-life conflict and self-reported health among working adults in contemporary welfare countries in Europe.
Methods: Data from the 6th European Working Conditions Survey 2015 on 32,275 working adults from 30 countries in Europe were analysed. Multivariate logistic regression models were used to examine the associations between work-life balance and self-reported health among men and women. We further used

a 2 stage multi-level logistic regression to assess variations in self-reported health among welfare state regimes by gender. **Results:** The results showed a strong association between work-life conflict and poor self-reported health among working adults in Europe (aOR = 2.07; 95% CI: 1.93-2.23). However, the magnitude of the effect differed slightly by gender (men: aOR = 1.97; 95% CI: 1.78-2.18 vs women: aOR = 2.23; 95% CI: 2.01-2.47). Furthermore, we found variations in the relationship between work-life conflict and poor self-reported health between welfare states regimes. The association was found to be weaker in the Nordic and Southern welfare states than the Liberal, Conservative, and Central Eastern European welfare states. Although the associations were more consistent among men than women in the Conservative welfare states regime, we found higher associations for women than men in the Southern, Nordic, Liberal, and Central Eastern European welfare states. **Conclusions:** This study provides evidence of some variations in the association between work-life conflict and poor self-reported health among men and women across welfare states regimes in Europe. The results demonstrate the need for governments, organizations and policymakers to provide conducive working conditions and social policies for working adults to deal with competing demands from work and family activities.

Work-relatedness of the presented health problem and sickness absence
Background: Perception by workers of their health problems as work-related is possibly associated with sickness absence (SA). The aim of this study was to study the relationship between perceived work-relatedness of health problems and SA among workers who visit their GP, taking the influence of other potential determinants into account and to study the influence of these determinants on SA. Design and setting prospective cohort study in 32 Dutch GP practices. **Methods:** A secondary analysis of RCT data among workers, aged 18-63 years, who visited their GP. We measured self-reported SA days in 12 months and high SA (>20 days in 12 months) and compared workers who perceived work-relatedness (WR+) with workers who did not (WR-). With multivariable linear and logistic regression models, we analyzed the influence of age, gender, experienced health, chronic illness, prior SA, number of GP consultations and perceived work ability. **Results:** We analyzed data of 209 workers, 31% perceived work-relatedness. Geometric mean of SA days was 1.6 (95% CI: 0.9-3.0) for WR+- workers and 1.2 (95% CI: 0.8-1.8) for WR-workers (P = 0.42). Incidence of high SA was 21.5 and 13.3%, respectively (odds ratio 1.79; 95% CI: 0.84-3.84). SA was positively associated with chronic illness, prior SA, low perceived work ability and age over 50. **Conclusions:** Perceived work-relatedness was not associated with SA. SA was associated with chronic illness, prior SA, low perceived work ability and age over 50.

Stress and well-being at work: a literature review
The study presents empirical evidence of the personal and contextual variables that protect against the negative effects of stress on workers' well-being and health. A systematic review of the literature of the last eleven years (2006 to 2016) was carried out in the Ebsco, LILACS, SciELO, Google Scholar, and PubMed databases, and in six Annual Reviews journals. Fifty national and international articles related to stress and well-being were analyzed. The results show that work-related factors, personal resources such as resilience, self-efficacy, emotional competencies, psychological detachment, work-life interface, and group-level factors have effects on well-being. The perceived social support of peers and managers, alongside

autonomy at work, attenuate the negative impact of stress on well-being. It ends with suggestions for future studies to test relationships between variables that have not yet been explored and to deepen the understanding of the relationships between stress and well-being at work.

Hirschle et al. 2020.

Ciencia Saude Coletiva, vol. 25, no. 7.

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Keywords: Stress; well-being; literature review; workers; health.

Evidence Level: 6A

Link: https://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232020000702721&lng=en&nrm=iso&tlng=en

Recovery from work: testing the effects of chronic internal and external workload on health and well-being

Background: The aim of this study was to examine the effects of reduced recovery opportunities on health, associated with chronic internal workload (i.e. during work) and external workload (ie, following work). **Methods:** Data from two consecutive surveys (2013 and 2016) from the Norwegian Living Conditions Survey on Work Environment were used. To assess a dose-response association between workload and health, self-reported ratings of internal workload (i.e. having too much to do and skipping lunch breaks during work) and external workload (i.e. using mobile technology for work-related issues during leisure time) over the two time periods were divided into tertile groups representing low, medium and high workload. Anxiety, depression, physiological and psychological fatigue and sleep were assessed as outcome symptoms. **Results:** Chronic medium levels of internal workload were associated with psychological fatigue (OR=2.84, 95% CI 1.75 to 4.62) and physical fatigue (OR=1.85, 95% CI 1.31 to 2.63), and high internal workload was associated with psychological fatigue (OR=7.24, 95% CI 4.59 to 11.40), physical fatigue (OR=4.23, 95% CI 3.06 to 5.83) and sleep problems (OR=1.81, 95% CI 1.07 to 3.05). Chronic external high workload was only associated with psychological fatigue (OR=1.67, 95% CI 1.26 to 2.22) and with physical fatigue problems (OR=1.47, 95% CI,1.09-1.98) when the data were adjusted for age, gender, education level, job autonomy and occupational status. **Conclusions:** This study emphasises that individuals who chronically experience high workload are at an increased risk for reporting psychological and physical fatigue, and sleep problems.

Cropley et al. 2020.

Journal of Epidemiological and Community Health.

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Keywords: Workplace; employment; epidemiology of chronic diseases; heart disease; methodology; mortality; psychological stress; work stress.

Evidence Level: 4B

Link: https://jech.bmj.com/content/early/2020/07/08/jech-2019-213367.long

Work Health and Safety

Topic modeling of social networking service data on occupational accidents: LDA analysis

Background: In most industrialized societies, there are regulations, inspections, insurance, and legal options to support workers who suffer from injury, disease, or death in relation to their work; in practice these resources are imperfect and or even being unavailable due to workplace or employer obstruction. Thus, limitations exist to identify unmet needs in occupational safety and health information. **Objective:** This study was aimed to explore hidden issues in occupational accidents from social network services (SNS) data using topic modeling. **Methods:** Using the results of a Google search for the phrase "occupational/industrial accident" and "occupational diseases," a total of 145 websites were selected. From among these websites, we collected 15,244 documents on occupational accidents-related queries between 2002 and 2018. To transform unstructured text into structure data, natural language processing of the Korean language was conducted. We performed the Latent Dirichlet allocation (LDA) as a topic model using Python library. A time-series linear regression analysis was also conducted to identify yearly trends for the given documents. **Results:** Results of LDA model showed 14 topics with three themes: "Workers'

compensation benefits" (Theme 1), "Illicit agreements with the employer" (Theme 2), and "Fatal and non-fatal injuries and vulnerable workers" (Theme 3). Theme 1 was the largest cluster (52.2%) of the collected documents and included keywords related to workers' compensation (i.e., company, occupational injury, insurance, accident, approval, and compensation) and keywords describing the specific compensation benefits such as medical expense benefits, temporary incapacity benefits, and disability benefits. In the yearly trend, Theme 1 gradually decreased, but other themes showed an overall increasing pattern. Certain queries (i.e., musculoskeletal system, critical care, and foreign workers) had no significant variation in the number of queries. **Conclusions:** We conducted LDA analysis with SNS data of occupational accidents-related queries and discovered that the primary concerns of workers posting on occupational injuries and diseases were workers' compensation benefits, fatal and non-fatal injuries and vulnerable workers, and illicit agreements with the employer. While traditional systems focus mainly on quantitative monitoring of occupational accidents, qualitative aspects formulated by topic modeling from unstructured SNS queries may be valuable for tackling inequality and improving occupational health and safety.

Epidemiological and clinical characteristics of fall-related injuries: a retrospective study

Background: Fall-related injuries are important public health problem worldwide. We aimed to describe the epidemiological and clinical characteristics of fall-related injuries in a level 1 trauma center. **Method:** A retrospective analysis of Qatar Trauma Registry data was conducted on patients admitted for fall-related injuries between 2010 and 2017. Comparative analyses of data by gender, age-groups and height of falls were performed to describe the epidemiological and clinical characteristics of patients, and in-hospital outcomes. **Results:** A total of 4040 patients with fall-related injuries were identified in the study duration which corresponds to the rate of 2.34 per 10,000 population. Although the rate of fall-related injuries decreased over the years, the average number of patients per year remained high accounting for 32% of the hospitalized patients with moderate to severe injuries. Most of the injuries affected the head (36%) followed by spines (29%) and chest (23%). Males were predominant (89%), more likely to fall at workplace, fall from a greater height and have polytrauma than females. The working age-group (20-59 years) constituted the majority of injured (73%) and were more likely to fall at workplace, and to fall from higher heights compared to the older adults who sustained more fall at home. Overall in-hospital mortality was 3%. Outcomes including longer hospital length of stay and mortality were generally correlated with the height of fall except for the fall at home. **Conclusion:** Fall-related injuries remain as significant burden even in a level 1 trauma center. Variations in the pattern of injuries by age, gender and height of fall provide important information for targeted preventive measures.

Comparison of the characteristics of work-related injuries between older workers and the workers of the conventional working-age in the Republic of Korea, 2010-2014

Objective: With population ageing, the number of older workers is increasing and the number of work-related injuries in older people is also increasing. Occupational patterns and work-related injury patterns vary with age. This study aimed to compare the incidence and characteristics of work-related injuries in older and younger workers in Korea. **Methods:** We conducted a retrospective review of the characteristics of workers hospitalised with work-related injuries from January 2010 to December 2014, using data from the National Hospital Discharge In-Depth Injury Survey in South Korea. The analysis was stratified by age into older (aged ≥65 years) and younger (aged 20-64 years) workers. **Results:** The hospitalisation rate in

older workers was double that of younger workers (2014 IRR: 2.06, 95% CI 1.53 to 2.76). Compared with workers of conventional working-age, a higher proportion of injured older workers were female (33.1% vs 13.6%, p<0.001), injured due to falls (40.8% vs 28.5%) and injured while working on a farm (46.5% vs 6.3%, p<0.001). In older workers, work-related injuries were seasonal and peaked during summer, but there was little seasonality in injuries among younger workers. **Conclusion:** Older workers are more vulnerable to work-related injuries and have a different profile of work-related injuries from younger workers. Age-related differences in the injury profile need to be considered when developing workplace injury prevention policies and programmes, and the specific vulnerabilities of older workers need to be addressed.

Lee et al. 2020.
Injury Prevention.

Association of job category and occupational activity with breast cancer incidence in Japanese female workers: the JACC study

Background: Breast cancer represented the leading cause of cancer deaths among women in Japan. Although physical activity has been reported protective against breast cancer, scientific evidence is limited on the risk of breast cancer according to job category or occupational activity in Japanese. Our objective was to examine the association of job category and occupational activity with breast cancer incidence in Japanese female workers using the data from the Japan Collaborative Cohort (JACC) Study. **Methods:** A prospective cohort study involving 19,041 women aged 40-79 years who have reported their occupational data and followed-up from 1988 to 2009. All variables were assessed by a self-administered questionnaire. Cancer incidence data were obtained from 24 areas of the JACC study through cancer population data registration, or review of hospital records. The Cox proportional hazard models were operated to calculate the hazard ratios (HRs) and corresponding 95% confidence intervals (CIs). **Results:** There were 138 incident cases of breast cancer during 13.3 years median follow-up period. Office workers compared with manual workers were at a higher risk of breast cancer after adjusting for reproductive health factors and physical activity indicators; the multivariable HR (95% CI) was 1.65 (1.07-2.55). Also, women who had mainly a sitting position during work compared with those moving during work had the higher risk: the multivariable HR (95%CI) of 1.45 (1.01-2.12). The excess risk of breast cancer was observed for office workers when time spent in walking was < 30 min/ day; HR (95% CI) was 1.11 (1.01-1.23), and for women mainly at a sitting position during work when time spent in walking was 30-59 min or < 30 min/day; HRs (95% CIs) were 1.87 (1.07-3.27) and 1.74 (1.07-2.83), respectively. **Conclusion:** The job category and occupational activity were associated with risk of breast cancer incidence. A high risk was observed in office workers and in women with a sitting position during work. These observed increased risks were evident in women with less daily walking activity.

Sari et al. 2020.
BMC Public Health, vol. 20, no. 1.

Chronic Health Issues

Symptoms of ocular surface disease in construction workers: comparative study with office workers
Background: To investigate and contrast the prevalence of dry eye symptoms in construction workers and office workers using the OSDI questionnaire. **Methods:** A cross-sectional, observational study was conducted using the OSDI questionnaire to evaluate dry eye symptoms and associated risk factors. Sampled

size calculation with a power of 80% and a 95% degree of confidence suggested the inclusion of 298 participants. **Results:** We studied 304 subjects (149 construction workers and 155 office workers). More than half (55%) of the participants presented dry eye symptoms (OSDI > 12). The average OSDI score was 21.30 ± 22.20 points, being lower in the group of construction workers (12.45 ± 17.50) than in-office workers (28.51 ± 22.99) (p < 0.001). Considering participants who had moderate and severe symptoms (23 to 100 points in OSDI), office workers presented dry eye symptoms 4.15 times more frequently than construction workers (OR 4.15, 95% CI 2.52, 6.85). Women presented statistical evidence of higher OSDI scores than men (32.47 ± 23.72 vs. 14.87 ± 18.48, respectively). **Conclusions:** construction workers have four times less risk of presenting dry eye symptoms than people working in the average office space. This highlights the pernicious effects on the ocular surface of the office environment, which poses a significant risk for the development or worsening of dry eye symptoms.

Hernandez-Llamaset al. 2020.
BMC Ophthalmology, vol. 20, no. 1.
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Keywords: Dry eye symptoms; OSDI; occupational risk, office, construction workers.
Evidence Level: 4A
Link: https://bmcophthalmol.biomedcentral.com/articles/10.1186/s12886-020-01548-0

Occupational distribution of metabolic syndrome prevalence and incidence differs by sex and is not explained by age and health behavior: results from 75 000 Dutch workers from 40 occupational groups
Introduction: This study examines the association between 40 occupational groups and prevalence and incidence of metabolic syndrome (MetS), separately for male and female workers, and whether age and health behaviors can explain the association. **Research design and methods:** Data from 74 857 Lifelines Cohort and Biobank Study participants were used to regress occupational group membership, coded by Statistics Netherlands, on the prevalence and incidence of MetS using logistic and Cox regression analyses. MetS diagnosis was based on physical examinations, blood analysis, and recorded medication use. Information on age, smoking status, physical activity, diet and alcohol consumption was acquired using questionnaires. **Results:** Baseline MetS prevalence was 17.5% for males and 10.6% for females. During a median 3.8 years of follow-up, MetS incidence was 7.8% for males and 13.2% for females. One occupational group was associated with an increased MetS risk in both sexes. Six additional occupational groups had an increased risk for MetS among men, four among women. Highest risks were found for male 'stationary plant and machine operators' (HR: 1.94; 95% CI 1.26 to 3.00) and female 'food preparation assistants' (HR: 1.80; 95% CI 1.01 to 3.22). **Conclusions:** Findings suggest that occupational group matters for men and women in MetS development, and that differences in MetS prevalence across occupations are not merely a reflection of selection of metabolically unhealthy workers into specific occupations. The striking sex differences in the occupational distribution of MetS indicate that preventive measures should, with some exceptions, target men and women separately.
Van Zon et al. 2020.
BMJ Open, vol. 8, no. 1.
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Keywords: Epidemiology; metabolic syndrome; occupational health; public health.
Evidence Level: 4B
Link: https://drc.bmj.com/content/8/1/e001436.long

Occupational Exposure

Biomonitoring for occupational exposure to Diisocyanates: A systematic review
Diisocyanates are a group of chemicals that are widely used in occupational settings. They are known to induce various health effects, including skin- and respiratory tract sensitization resulting in allergic dermatitis and asthma. Exposure to diisocyanates has been studied in the past decades by using different types of biomonitoring markers and matrices. The aim of this review as part of the HBM4EU project was to assess: (i) which biomarkers and matrices have been used for biomonitoring diisocyanates and what are their strengths and limitations; (ii) what are (current) biomonitoring levels of the major diisocyanates (and

metabolites) in workers; and (iii) to characterize potential research gaps. For this purpose we conducted a systematic literature search for the time period 2000-end 2018, thereby focussing on three types of diisocyanates which account for the vast majority of the total isocyanate market volume: hexamethylene diisocyanate (HDI), toluene diisocyanate (TDI), and 4,4'-methylenediphenyl diisocyanate (MDI). A total of 28 publications were identified which fulfilled the review inclusion criteria. The majority of these studies (93%) investigated the corresponding diamines in either urine or plasma, but adducts have also been investigated by several research groups. Studies on HDI were mostly in the motor vehicle repair industry [with urinary hexamethylene diamine result ranging from 0.03 to 146.5 µmol mol-1 creatinine]. For TDI, there is mostly data on foam production [results for urinary toluene diamine ranging from ~0.01 to 97 µmol mol-1 creatinine] whereas the available MDI data are mainly from the polyurethane industry (results for methylenediphenyl diamine range from 0.01 to 32.7 µmol mol-1 creatinine). About half of the studies published were prior to 2010 hence might not reflect current workplace exposure. There is large variability within and between studies and across sectors which could be potentially explained by several factors including worker or workplace variability, short half-lives of biomarkers, and differences in sampling strategies and analytical techniques. We identified several research gaps which could further be taken into account when studying diisocyanates biomonitoring levels: (i) the development of specific biomarkers is promising (e.g. to study oligomers of HDI which have been largely neglected to date) but needs more research before they can be widely applied, (ii) since analytical methods differ between studies a more uniform approach would make comparisons between studies easier, and (iii) dermal absorption seems a possible exposure route and needs to be further investigated. The use of MDI, TDI, and HDI has been recently proposed to be restricted in the European Union unless specific conditions for workers' training and risk management measures apply. This review has highlighted the need for a harmonized approach to establishing a baseline against which the success of the restriction can be evaluated.

Scholten et al. 2020.

Occupational exposure to noise and cold environment and the risk of death due to myocardial infarction and stroke

Purpose: The present study examined a possible association between occupational exposure to noise, working and living in cold conditions, and the risk of mortality in myocardial infarction and stroke.
Methods: The present cohort study consists of 194,501 workers in the Swedish construction industry that participated in health examinations between 1971 and 1993. Noise exposure was defined on a job-exposure matrix based on a survey of the working conditions carried out during the mid 1970s. All workers were categorised into three main regions of Sweden, differing in temperature: Reference (Götaland), colder (Svealand), and coldest (Norrland). Relative risks (RR) were analysed by negative binomial regression adjusting for age, BMI, and smoking habits. **Results:** Moderate and high noise exposure was associated with increased risk of myocardial infarction (RR 1.10-1.13 with 95% CI over unit) and stroke mortality (RR 1.15 to 1.19 with 95% CI over unit). There was an increased risk for myocardial infarction (RR 1.10, 95% CI 1.01-1.20), but not for stroke mortality (RR 1.09, 95% CI 0.94-1.25) associated with living and working in the coldest region. There was an interaction on the risk of myocardial infarction mortality between different regions and noise exposure (p = 0.016), but not for stroke mortality (p = 0.88). **Conclusions:** The study indicates an interaction between working at hazardous noise levels and living and working in cold conditions for increased mortality in myocardial infarction.

Pettersson et al. 2020.

A Case of Autoimmune Hepatitis after Occupational Exposure to N,N-Dimethylformamide

N,N-dimethylformamide (DMF), a widely used solvent in the chemical industry, is known to induce toxic hepatitis. However, there have been no reported cases of DMF-associated autoimmune hepatitis. A 31-year-old healthy man working at a glove factory since July 2015 had intermittently put his bare hands into a diluted DMF solution for his first 15 days at work. After 2 months, he felt nausea, fatigue, and hand cramping, and a jaundice followed. His laboratory findings showed positive autoantibodies and elevated immunoglobulin G (IgG), and his liver biopsy pathology was typical of autoimmune hepatitis (AIH). Prednisolone and azathioprine therapy began, and he recovered rapidly without adverse events. Though his liver chemistry was normalized, the IgG level remained persistently upper normal range. His 2nd liver biopsy performed in April 2019 showed mild portal activity, and he was well under a low dose immunosuppressive therapy up to April 2020. This case warns of the hazard of occupational exposure to DMF, and clinicians should be aware of DMF-related AIH for timely initiation of immunosuppressive therapy.

A scoping survey of attitudes towards occupational exposure limits and reach derived no effect levels for workers among chemical risk managers at Swedish workplaces

Objectives: Setting and implementing occupational exposure limits (OELs) is one of the measures taken to protect workers from adverse effects of hazardous chemicals. The EU Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) introduced an additional kind of exposure guidance values for workers; namely, the derived no effect level (DNEL) for workers' inhalation exposure (worker DNEL). About 500 substances have a Swedish OEL, while roughly 5000 substances have a worker DNEL derived by REACH registrants. This work aims to investigate how the Swedish OELs and worker DNELs are perceived at Swedish workplaces, and whether worker DNELs are considered a possible alternative to OELs when the latter are lacking. **Material and methods:** An online questionnaire was designed and sent to Swedish companies identified through the European Chemicals Agency's database of registered substances (N = 126) and the Swedish Chemicals Agency's registry of companies that import or manufacture notifiable chemical products (N = 227). The response rates were 52% and 38%, respectively. **Results:** The respondents stated that they were using the Swedish OELs and most of them considered these to be a suitable risk management tool. As about one-third of the respondents expressed that they had some experience in using substances without the Swedish OELs, there are certain data gaps that worker DNELs may fill. One-third of the respondents familiar with worker DNELs stated that they would consider using worker DNELs for substances without the Swedish OELs. However, nearly half of the respondents reported to be unfamiliar with worker DNELs. **Conclusions:** Poor familiarity with DNELs may pose an obstacle to properly recognizing DNELs' potential as well as the possible limitations of individual DNELs. There is a need for education about DNELs, as well as for tools facilitating the evaluation of DNELs and OELs from other sources in cases where the applicable Swedish OEL is lacking.

Planned organizational change to transform care to workers exposed to biological material

Objectives: to describe the evaluation of the service offered in cases of occupational accidents involving exposure to biological material, from the perspective of the exposed workers, before and after an intervention to obtain planned organizational change. **Methods:** descriptive study with a qualitative approach, carried out with workers exposed to biological material who received care at a reference service that was submitted to an intervention based on planned organizational change. Data were collected by using the critical incident technique and analyzed from the perspective of content analysis. **Results:** twenty exposed workers participated in the study and were split into two groups in the pre- and post-intervention phase. Categories regarding improvement in the guidance they received, reduction in the time they waited once they got to the facility, organization of the process, documentation qualification, and professionalism in carrying out the assistance emerged from the workers' accounts. **Conclusions:** the present study allowed the exposed workers to visualize the changes that happened in the care management in case of accidents involving biological material. Additionally, there was the recognition of the adopted methodological path, which allowed the active participation of the people involved.

Occupational benzene exposure and the risk of genetic damage: a systematic review and meta-analysis

Background: Benzene, an important component of organic solvents, is commonly used in industry. Meanwhile, benzene is a human carcinogen leading to leukemia. Although the links between benzene and various types of genetic damage indicators have been evaluated in several studies, but their results remain inconsistent. So we conducted a meta-analysis, and to explore the influence of low concentration benzene exposure on workers' genetic damage indicators using 3.25 mg/m3 as the boundary value, in order to provide a basis for improved prevention and control of the harm from benzene exposure to the occupational population. **Methods:** We conducted a search of five databases, including Pub Med, Web of Science, China National Knowledge Infrastructure (CNKI), Wan Fang Data and Chongqing VIP, to identify relevant articles up to December 25, 2018. Two researchers independently extracted and evaluated the data according to the inclusion and exclusion criteria of the literature. The imported articles were managed by Endnote X7, and the data were extracted and sorted by Excel 2013. We utilized Stata 12.0 software to perform the meta-analysis in the present study. **Results:** A total of 68 eligible articles were finally included for the synthetic analyses. The meta-analysis results showed that occupational benzene exposure led to significantly increased Micronucleus (MN) frequency, Sister chromatid exchange (SCE) frequency, Chromosome aberration (CA) frequency, Olive Tail moment (OTM), Tail moment (TM), Tail length (TL), and Tail DNA% (T DNA%) compared to the control group ($P < 0.05$), and the pooled effect value estimates were 1.36, 0.98, 0.76, 1.06, 0.96, 1.78, and 1.42, respectively. Subsequent analysis of the effect of low concentration benzene exposure on genetic damage found significantly increased MN frequency increased compared with the control group ($P < 0.05$). **Conclusions:** Occupational benzene exposure can affect multiple genetic damage indicators. Even at an exposure concentration lower than 3.25 mg/m3, benzene exposure has genotoxicity. These data provide an important scientific basis for the further revision of occupational disease prevention strategies. At the same time, increased attention should be focused on the health monitoring of the occupational population exposed to benzene, and health management should be strengthened to improve the health of the occupational population.

Occupational exposure to inorganic dust and risk of gout: a population-based study
Background: Risk factors operating independently of hyperuricemia could be of importance in determining why only a minority of people with hyperuricemia develop gout. Exposure to inorganic dust has been linked to other inflammatory diseases and could influence the development of gout. **Objectives:** To evaluate if occupational exposure to inorganic dust increases the risk of gout. **Methods:** Individuals aged 30-65 years with a first gout diagnosis in 2006-2012 in the population-based healthcare database of the Western Swedish Healthcare Region (VEGA) and population controls matched by age and sex were included. Data on occupation was collected from the Swedish occupational register. Exposure status was assigned by means of a job exposure matrix. Data on gout-related comorbidities was collected from VEGA. Alcohol use disorder and obesity were related both to gout and exposure to inorganic dust and were adjusted for in multivariate analyses. ORs were calculated using conditional logistic regression. **Results:** 5042 gout cases and 20 682 controls were included. Exposure to inorganic dust was associated with gout in both unadjusted (OR 1.12, 95% CI 1.04 to 1.20) and multivariate (OR 1.08, 95% CI 1.00 to 1.16) analyses of the whole population. In sex-stratified multivariate analyses, dust exposure was significantly associated with gout in women (adjusted OR 1.26, 95% CI 1.05 to 1.51), but not in men (adjusted OR 1.05, 95% CI 0.97 to 1.13). **Conclusions:** We describe for the first time an association between exposure to inorganic dust and gout. After adjusting for confounders, the findings were statistically significant for women but not for men.
Sigurdardottir et al. 2020.
RMD Open, vol. 6, no. 2.
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Keywords: Arthritis; epidemiology; gout.
Evidence Level: 4A
Link: https://rmdopen.bmj.com/content/6/2/e001178.long

Sedentary Practices

Using internet of things to reduce office workers' sedentary behavior: Intervention development applying the behavior change wheel and human-centered design approach
Background: Sedentary behavior (SB) is associated with various adverse health outcomes. The prevalence of prolonged sitting at work among office workers makes a case for SB interventions to target this setting and population. Everyday mundane objects with embedded microelectronics and ubiquitous computing represent a novel mode of delivering health behavior change interventions enabled by internet of things (IoTs). However, little is known about how to develop interventions involving IoT technologies. **Objective:** This paper reports the design and development of an IoT-enabled SB intervention targeting office workers. **Methods:** The process was guided by the behavior change wheel (BCW), a systematic framework for theory-informed and evidence-based development of behavior change interventions, complemented by the human-centered design (HCD) approach. Intervention design was shaped by findings from a diary-probed interview study (n=20), a stakeholder design workshop (n=8), and a series of theoretical mapping and collaborative technical design activities. **Results:** The resulting intervention named WorkMyWay targets a reduction in office workers' prolonged stationary behaviors at work and an increase in regular breaks by modifying behavioral determinants in 11 theoretical domains with 17 behavior change techniques. The delivery technology consists of a wearable activity tracker, a light-emitting diode reminder device attached to a vessel (ie, water bottle or cup), and a companion Android app connected to both devices over Bluetooth. The delivery plan consists of a 2-week baseline assessment, a 30-min face-to-face action planning session, and 6-week self-directed use of the delivery technology. **Conclusions:** This is the first study to demonstrate that it is possible to develop a complex IoT-enabled intervention by applying a combination of the BCW and HCD approaches. The next step is to assess the feasibility of WorkMyWay prior to testing intervention efficacy in a full-scale trial. The intervention mapping table that links individual intervention components with hypothesized mechanisms of action can serve as the basis for testing and clarifying theory-based mechanisms of action in future studies on WorkMyWay.
Huang et al. 2020.
JMIR Mhealth Uhealth, vol. 8, no. 7.

Physical Activity

The occupational sitting and physical activity questionnaire (OSPAQ): a validation study with accelerometer-assessed measures

Background: The Occupational Sitting and Physical Activity Questionnaire (OSPAQ) was developed as an easy-to-use instrument for self-reported assessment of percentage sitting, standing, walking, and performing heavy labour in a workplace setting. This study aimed to evaluate the concurrent validity of all dimensions of the OSPAQ compared to accelerometer-assessed measures of occupational physical activities in a mixed sample of sedentary and physically active professions. **Methods:** Data from the Flemish Employees' Physical Activity (FEPA) study were used, including employees from the service and production sector. All participants filled in a questionnaire, underwent clinical measurements, and wore two Axivity AX3 accelerometers for at least 2 consecutive working days. Intraclass (ICC) and Spearman rho correlations (r) were analyzed to assess concurrent validity. **Results:** The sample included 401 workers (16% sedentary profession) with a mean age of 39.2 (± 11) years. Concurrent validity was good and moderate for assessing percentage of sitting (ICC = 0.84; r = 0.53), and standing (ICC = 0.64; r = 0.53), respectively. The concurrent validity for walking was weak to moderate (ICC = 0.50; r = 0.49), and weak for performing heavy labour (ICC = 0.28; r = 0.35). Stronger validity scores were found in sedentary professions for occupational sitting and standing. In physically active professions, an underestimation of self-reported sitting and standing was found, and an overestimation of self-reported walking and heavy labour. No significant self-reported over- or underestimation was found for sitting and heavy labour in sedentary professions, but an underestimation of self-reported standing and an overestimation of self-reported walking was observed. **Conclusions:** The OSPAQ has acceptable measurement properties for assessing occupational sitting and standing. Accelerometer-assessed measures of occupational walking and heavy labour are recommended, since a poor concurrent validity was found for both.
Maes et al. 2020.
BMC Public Health, vol. 20, no. 1.

Covid-19

Mental health and work attitudes among people resuming work during the COVID-19 pandemic: A cross-sectional study in China

The unprecedented outbreak of the Coronavirus Disease 2019 (COVID-19) caused an economic downturn and increased the unemployment rate in China. In this context, employees face health and social economic stressors. To assess their mental health (i.e., anxiety, depression, insomnia and somatization) and work attitudes (i.e., work engagement, job satisfaction and turnover intention) as well as the associated factors, we conducted a cross-sectional study among people who resumed work after the Spring Festival holiday during the COVID-19 pandemic. The results show that the prevalence of anxiety, depression, insomnia and somatization among these people was 12.7%, 13.5%, 20.7% and 6.6%, respectively. The major risk factor for mental health was worrying about unemployment, and the main protective factors were psychological strengths (i.e., resilience and optimism). Regarding work attitudes, the percentage of people who felt more satisfied with their job (43.8%) was larger than that of those who felt less satisfied (26.9%), while the percentage of people who thought about quitting their job more frequently (15.7%) was smaller than that of those who considered it less frequently (63.2%). However, work engagement was lower than usual.

Similar to the factors associated with mental health, the major risk factor for work attitudes was also worrying about unemployment, and the main protective factors were resilience and optimism. In addition, the nature of the organization, job status, age, position and income changes were also related to these work attitudes. Our findings shed light on the need for organization administrators to be aware of the status of and factors associated with employees' mental health and work attitudes during the COVID-19 pandemic. Policies or interventions could be developed based on our findings.

Estimating the number of Korean workers at high risk of COVID-19 infection
Objectives: We aimed to identify occupational groups at high risk of COVID-19 infection, estimate the number of such workers, and examine the prevalence of protective resources by employment status in Korea. **Methods:** Based on the 6th Standard Occupational Classification codes, the 2015 census data was linked with the 5th Korean Working Conditions Survey data, which measures how frequently workers directly contact with people other than fellow employees in the workplace. **Results:** A total of 30 occupational groups, including seven occupations from healthcare and welfare sectors and 23 from other sectors, are classified as high-risk occupational groups to have frequent contact with people other than fellow employees in the workplace (more than half of the working hours). Approximately 1.4 million (women, 79.1%) and 10.7 million workers (46.3%) are employed respectively in the high-risk occupations of healthcare and welfare and other sectors. Occupations with a larger share of women are more likely to be at higher risk of infection and paid less. Among the wage-earners in the high-risk occupations, protective resources to deal with COVID-19 such as trade union and health and safety committee are less prevalent in temporary or daily workers than those in permanent employment. **Conclusion:** Given the large number of Korean workforces employed in high-risk occupations and inequality within the working population, the workplace needs to be the key locus for the governments' action to control the COVID-19, and special consideration for vulnerable workers should be warranted.