

departments associated to heavier and less autonomous patient handling activity, were most affected by back MSD.

**Discussion** Our investigation identifies biomechanical risk factor of MSD among nurses and suggests the necessity of preventive actions according to exposure level.

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#### NEWLY DEVELOPED AND REDESIGNED KEY INDICATOR METHODS FOR ASSESSMENT OF DIFFERENT PHYSICAL WORKLOADS – KEY ELEMENTS OF THE VALIDATION STUDY

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**Introduction** The assessment of work tasks with physical workloads is crucial to estimate the work-related health risks of employees. Three key indicator methods (KIMs) are available for risk assessment regarding manual lifting, holding and carrying of loads, manual pulling and pushing, and manual handling operations. Three further KIMs regarding whole-body forces, awkward body postures and body movement have been developed *de novo*. The development of a combined method for mixed exposures is planned. All methods will be validated regarding face validity, reliability, convergent validity, criterion validity.

**Methods** A mixed-methods study was designed for the validation of KIMs. The following working hypotheses (WH) are tested:

- WH 1: The KIMs reflect adequately the construct to be measured (face validity).
- WH 2: No relevant deviations occur between different users using KIMs and assessing the same workplaces (reliability).
- WH 3: Assessing workplaces using the KIMs and other screening methods will result in no relevant differences (convergent validity).
- WH 4: It is assumed that employees at workplaces with high KIM risk scores show adverse health related outcomes more frequently than non-exposed workers (criterion validity).

With this background a field study was conducted in companies of different sizes and branches in Germany as part of the joint project MEGAPHYS (multilevel risk assessment of physical workloads).

**Ethics and dissemination:** The study was planned and conducted in accordance with the Declaration of Helsinki, the design was approved by ethics committees. We intend to publish validated KIMs in 2018.

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#### ASSOCIATION OF PSYCHOLOGICAL DISTRESS AND WORK-RELATED FACTORS AND MULTISITE MUSCULOSKELETAL PAIN AMONG TEACHERS IN MALAYSIA

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**Introduction** Work-related factors are known to be associated with musculoskeletal pain (MSP), however psychological distress may also play an important role. The study aims to evaluate the association between psychological distress and work-related factors, and multisite MSP among teachers.

**Methods** This is a cross-sectional study conducted among teachers from six states in the Peninsular of Malaysia. Information on demographic characteristics, psychological distress, work-related factors and MSP from seven anatomical sites were collected using a self-administered questionnaire. Weight and height were measured using standardised methods. The association between MSP at three or more sites in the past month, and psychological distress and work-related factors were assessed using multivariate logistic regression.

**Results** 6796 teachers from 391 schools completed the questionnaire. The prevalence of self-reported MSP at three or more sites in past month were 38.22%. The three most common sites were neck (42.15%), shoulder (37.31%) and feet (36.28%). Psychological distress was more strongly associated with multisite MSP as compared to work-related factors, after controlling for potential confounders, i.e., age, gender, ethnicity, Body Mass Index, marital status and education level. Psychological distress symptoms like anxiety displayed the highest odds (Odds Ratio (OR) 2.27; 95% Confidence Intervals (95% CI) 1.97 to 2.63), followed with depression (OR 1.43; 95% CI: 1.15 to 1.78) and stress (OR 1.35; 95% CI: 1.03 to 1.76). The work-related factors with statistical significant findings were administrative duties (<4 hr/day) (OR 1.37; 95% CI: 1.12 to 1.68), teaching (<15 years) (OR 1.21; 95% CI: 1.00 to 1.47) and high psychological job demand (OR 1.05; 95% CI: 1.04 to 1.07). Other work-related factors did not show any association.

**Discussion** The study found that psychological distress, i.e., anxiety, depression and stress have stronger association with multisite MSP. Intervention to reduce multisite MSP should include psychological distress along with the improving work processes.

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#### PREVALENCE OF MUSCULOSKELETAL DISEASES IN BANRO NAMOYA GOLD MINING WORKERS ATTENDING COMPANY CLINIC FROM JANUARY 2015 TO DECEMBER 2016

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