437 EFFECTS ON PRESENTEEISM OWING TO FEAR-AVOIDANCE BELIEFS OF WORKERS WITH MUSCULOSKELETAL PAIN: A ONE-YEAR COHORT STUDY

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Introduction Previous studies have reported on the relationship between workers' presenteeism, specifically where a loss of work productivity results from an employee's health problems, and musculoskeletal pain (MSP). Other studies have reported that chronicity and an increase in lower back pain were brought on by individual fear–avoidance beliefs. We considered that workers' fear-avoidance beliefs linked with MSP cause chronic MSP and exacerbate their presenteeism. The aim of this study was to clarify the effects of presenteeism arising from fear–avoidance beliefs among workers with MSP.
Methods We conducted a prospective study issuing self-administered questionnaires to 3406 workers in 118 companies, from June 2016 to February 2017. We distributed questionnaires on two occasions and obtained responses from 1673 individuals (response rate: 49.1%). In total, 1490 individuals were eligible for this survey (effective response rate: 89.1%). We excluded individuals whose pain status responses were not clear. We sought information from participants about various individual and work-related characteristics and the prevalence of MSP using an original questionnaire. The Work Functioning Impairment Scale (Wfun) was used to measure presenteeism, and the Tampa Scale for Kinesiophobia (TSK) was used to measure fear–avoidance beliefs. We statistically analysed the change in the Wfun and the TSK scores among groups with: no prevalence of MSP; transitional MSP (in two groups, with participants either developing or recovering from MSP), and; chronic MSP.
Results The Wfun score in the chronic MSP group was significantly higher than that of the other groups for both survey measures. The TSK score of the chronic MSP group was also significantly higher than for the transitional MSP groups. We observed a significant positive correlation between the change of Wfun score and TSK score.
Conclusion Our study suggests that fear-avoidance beliefs of workers with MSP leads to MSP chronicity, and exacerbates worker presenteeism.

498 ESTIMATING AND INTERPRETING EFFECTS FROM NONLINEAR EXPOSURE-RESPONSE CURVES IN OCCUPATIONAL COHORTS USING TRUNCATED POWER BASIS EXPANSIONS AND PENALISED SPLINES

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Introduction The Cox proportional hazards model is frequently used to model survival or time-to-event data. In occupational settings it is common to have an occupational exposure as one of the explanatory variables in the model and the association between the outcome and this exposure is of interest. Interpretation of nonlinear exposure-response relationships is useful in epidemiological risk assessment and methods for modelling nonlinearities are needed in those situations when a linear exposure-response is not expected or when one desires to formally assess a nonlinear association.
Methods Truncated power basis expansions and penalised spline methods are demonstrated for estimating nonlinear exposure-response relationships. Interpretation of the nonlinear estimates are given. Methods are illustrated on a simulated data set under a known exposure-response relationship and in a data application examining the association between risk of carpal tunnel syndrome and job physical exposure as measured by the Strain Index in an occupational cohort.
Discussion Regression modelling often focuses on interpreting coefficient estimates. When exposure-response relationships are nonlinear and a nonparametric or smoothing method is used to estimate the relationship, the resulting regression coefficients are not individually interpretable. But, these methods do provide effect size estimates which are interpretable – estimates at specific exposures of interest. The methods can be coded directly in R, using readily available example R code as a guide.

426 BI-DIRECTIONAL ASSOCIATION BETWEEN STRESS AND MUSCULOSKELETAL PAIN: 1-YEAR PROSPECTIVE COHORT STUDY WITH WEEKLY REGISTRATIONS

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Introduction Stress and musculoskeletal pain are major reasons for sickness absence. Although stress and pain are considered two different disorders and therefore treated and prevented separately, recent years research suggest that they may influence and reinforce each other. The objective of the present study was to investigate the prospective association between perceived stress and musculoskeletal pain.
Methods A cohort of 6943 technical assistants and machine technicians across Denmark participated in the NUDATA (Neck and Upper extremity Disorders Among Technical Assistants) study. Participants replied to a baseline and 12 month follow-up questionnaire about work and health. In between baseline and follow-up, they replied to weekly questions about perceived stress and musculoskeletal pain. The year was separated in three equal phases. Prospective associations between stress and pain were modelled using generalised estimating equations. The predictor variable was in phase 2 and the outcome variable in phase 3, always adjusted for phase 1. The models were further controlled for gender, age, physical and psychosocial work environment, lifestyle, education, chronic disease, mental health, multisite pain, musculoskeletal accidents, and baseline value of the outcome.
Result Perceived stress significantly increased the odds for pain in the neck (OR 2.10), shoulders (OR 2.02), elbow (OR 2.63), forearm (OR 1.93) and hand (OR 3.56). For the opposite association, shoulder pain (OR 2.37), forearm pain (OR 1.85) and hand pain (OR 1.90) significantly increased the odds of stress.
Discussion Our prospective study showed that while stress increases risk of pain in the neck and upper extremities, such pains also increases the risk of stress. The study supports existing findings from both experimental and brain research, proposing that development of stress and pain should be seen

as separate but intertwined processes. Further research should be conducted to better understand the mechanisms of this interaction.

395 STIFF PERSON SYNDROME WITH REFLEX MYOCLONUS AND OCCUPATIONAL INCAPACITY. CASE REPORT

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Introduction The stiff person syndrome it's a rare and not common neurological disorder, of unknown aetiology. There have been more than over 250 cases in the last 30 years. It consists in a long-term evolution of progressive muscle rigidity, with painful muscle spasms, mainly axial and pelvic limbs that lead progressively to disability, associated comorbidity and death due to complications. Symptoms generally start between the 4th and the 5th decade of life.
Methods 39 years old worker, purified water seller, 2 years in service, with 20 Kg weight lifting. He begins with lumbar pain that doesn't respond to regular treatment; continues with decreased movement due to muscle rigidity, beginning with the upper extremities, moving forward to the pelvic limbs, with myoclonus and chorea, relating the symptoms to physical activity or stress that persists at rest. Physical examination: a slow and assisted walked was observed. Hypertonic lower limbs; presented myoclonus. Abolished reflections, strength and sensibility preserved. Myoclonus presented during examination with stiffness lower limbs, following walk tests. He continued without responding to treatment. Diazepam medication is added so he could fall asleep. He remains bedridden, performing only needed movements, with pain aggravation while presenting spasms.
Results Electromyography compatible with cervical and lumbar radiculopathy. Magnetic resonance without alterations. No Anti GAD test taken, considering only normal clinical description, laboratory data and consultancy results for diagnosis of the patient was stablished as stiff person syndrome with myoclonus version, determining incapacity due to a low compatibility with his job.
Discussion Progressively severe muscle stiffness typically develops in the spine and lower extremities; often beginning during a period of emotional stress. To make a right stiff man diagnose normality data in imaging studies are needed, laboratory data not concluding from another pathology, and relating clinical description. Anti GAD is presented only in 60% of the patients.

1341 CONTRIBUTION OF WORKPLACE PSYCHOSOCIAL FACTORS ON NECK AND SHOULDER SYMPTOMS AMONG MANUFACTURING WORKERS

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Introduction Neck and shoulder pain is a common complaint in workplaces, due to a combination of exposure to ergonomic and psychosocial factors. Information is relatively lacking on the contribution of workplace psychosocial factors to neck and shoulder symptoms. This investigation aimed to determine the contribution of workplace justice and job insecurity to neck and shoulder pain among manufacturing workers in Taiwan.
Methods A cross-sessional survey on a representative sample of employed workers were conducted in 2010. Those employed in manufacturing industries were included for this analysis. The adopted Chinese version of the Nordic Musculoskeletal Questionnaire was used to assess musculoskeletal symptoms. Self-reported neck and shoulder pain affecting work performance was considered the positive outcome. Self-reported ergonomic factors, workplace justice, and job insecurity were assessed by using previously validated instruments. General linear model was used to obtain relative risk (RR), and population attributable risk (PAR) was estimated.
Result Among the 24 427 participants completing the questionnaire, 8632 worked in manufacturing industries. Among them, 1291 (15%) complained of neck/shoulder pain affecting work performance. After adjusting for age, in men (5839, 68%), repeated hand monotonous motion (RR=1.32, 95% CI: 1.24 to 1.40), inappropriate work desk/chair height (RR=1.49, CI: 1.36 to 1.62), prolonged use of computers (RR=1.10, CI: 1.02 to 1.19), and low workplace justice (RR=1.53, CI: 1.40 to 1.68) were significant factors for neck/shoulder pain. The PARs for these factors were 6.5%, 19.7%, 1.9%, and 11.7%, respectively. In women, inappropriate work desk/chair height (RR=1.60, CI: 1.43 to 1.76), low workplace justice (RR=1.49, CI: 1.33 to 1.67), and job insecurity (RR=1.10, CI: 1.01 to 1.22) were significant factors. The PARs were 13.2%, 7.6%, and 2.0%, respectively.
Discussion Among manufacturing workers, neck/shoulder pain is related to psychosocial factors. The PAR of around 10% for these factors are lower than ergonomic factors, but should not be ignored when workplace strategies are to be developed to prevent musculoskeletal symptoms.

308 OCCUPATIONAL RISK FACTORS FOR HIP AND KNEE OSTEOARTHRITIS – EVIDENCE OF GENE-EXPOSURE INTERACTION: A CO-TWIN CONTROL STUDY IN DANISH TWINS

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Background No previous studies have examined if genetic factors interacts in the relationship between occupational risk factors and hip and knee osteoarthritis (OA).
Objective To examine occupational risk factors for Hip and Knee OA leading to Total Joint Arthroplasty, and if gene-exposure interaction, affect the risk factor-outcome relationship.
Material and methods In October 2012 all twin pairs alive in the Danish Twin Register (DTR) with at least one in the pair