O-269

SELF-ROSTERING AND SICKNESS ABSENCE – A DANISH COHORT STUDY ON PAYROLL DATA

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Introduction Work time control (WTC) is defined as ‘employees’ possibilities to control over the duration and distribution of own work time’. A recent study found shorter sickness spells on wards using participatory scheduling compared to traditional scheduling, and that a high level of control over working times provides possibilities to adjust job demands with employees’ prevailing resources.

Objectives The objective of this study was to investigate the association of WTC on sickness absence among nursing personnel in the public health care sector in Denmark.

Methods The study was based on the Danish Working Hour Database (DWHD), which is a nationwide database based on payroll data primarily from all the public hospitals in Denmark during 2007–2015. For the current analyses, we included 2049 departments (31 595 nursing personnel) that introduced the self-rostering tool ‘MinTid’ in the period 2011 to 2016. Rosters using MinTid are based on a combination of input and wishes from the employees regarding individual working hours and staffing requirements from the organization. Information on daily working hours as well as sickness absence is objectively obtained from the DWHD. Data was summarized on a yearly basis and analyzed using Proc Mixed, including repeated measures.

Results There was a notable difference in the number of sickness spell per year before (3.43 (3.41–3.52)) and after (3.36 (3.32–3.40)) introducing ‘MinTid’, and also a remarkable difference in the number of short-term (1–3 days) sickness spells per year before (3.36 (2.63–2.70)) and after (2.57 (2.54–2.61)) ‘MinTid’. We observed no difference in total number of sick days per year before and after introducing ‘MinTid’.

Conclusion Introduction of self-rostering tools seems to reduce the number of particularly short-term sickness spells in Danish public hospitals.

O-315

DETERMINANTS OF BURNOUT AMONG TEACHERS: A SYSTEMATIC REVIEW OF LONGITUDINAL STUDIES

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Introduction Teachers represent an occupation with high levels of burnout.

Objective To identify determinants of burnout in teachers.

Methods We conducted a systematic review according to PROSPERO protocol CRD42018105901. We performed literature search for the period 1990–2018 in three databases: MEDLINE, PsycINFO and Embase. We included longitudinal studies where burnout was dependent variable, with at least 50 participants per exposure group. We sorted and summarized studies by type of independent variables (determinants),

and used MEVORECH tool for risk of bias assessment (RBA). For quantitative synthesis, we focused on the emotional exhaustion dimension of burnout (EE). We standardized the reported regression coefficients and their standard error and plotted them using R software to distinguish between detrimental and protective determinants.

Results Qualitative analysis of included studies (n=33) identified 35 determinants studied among teachers. Most studies implemented two waves (W) of data collection with 6–12 months between W1 and W2, but different outcome definitions and instruments for data collection were used in different studies. Only four types of determinants could be summarized quantitatively: support, conflict, organisational context and individual characteristics, based on six studies. After plotting the results, individual characteristics (low teacher self-efficacy, low job satisfaction, neuroticism, and emotional exhaustion at W1) and organisational factors (classroom disruption, perceived collective exhaustion, and poor work climate) had significantly detrimental effect. The RBA showed that most studies assessed the major confounding factors, but had external and internal validity issues, due to limitations in sampling, inadequate reporting of response rates and exclusion rates, or use of self-reported instruments with uncertain validity and reliability.

Conclusion This review identified several detrimental determinants of burnout in teachers. The results on protective determinants were inconsistent between studies and varying from wave to wave. Further investigations should be conducted by using the same burnout definition and validated instruments for its measurement.

Lung Cancer and Mesothelioma

O-192

OCCUPATIONAL AND NON-OCCUPATIONAL FACTORS AND LUNG CANCER MORTALITY AMONG WORKERS OF THE SWISS NATIONAL COHORT

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Introduction Lung cancer is the most frequent cancer, with smoking and radon as the two leading causes. Occupational exposures are another important risk factor, with an estimated population attributable fraction up to 15%.

Objectives This study aimed at assessing the effect of occupational exposures on lung cancer mortality in Switzerland after adjustment for non-occupational lung carcinogens.

Methods We used negative binomial regression to analyse data of 4,351,383 Swiss residents with available occupation, and assess its effect on lung cancer mortality between 1990 and 2014, accounting for socio-demographic factors, smoking probabilities (by age, geographical region, civil status, educational level, nationality, and occupation) and measured environmental exposure to radon.

Results Male machine operators and workers in mining, stone working and building materials manufacturing showed the highest risk with a relative risk (RR) of 2.42 (95%-IC: 2.05–2.87) and 2.08 (95%-IC: 1.50–2.89) compared to health occupations, respectively. In women, two of the largest risks were identified in electronics, watchmaking, vehicle construction and toolmaking (RR : 2.33 (95%-IC: 1.75–3.10)) and transport and traffic occupations (RR : 2.23 (95%-IC: 1.75–2.83)). Smoking RRs were 1.33 (95%-IC: 1.27–1.38) in

males and 1.37 (95%-IC: 1.26–1.48) in females, while radon related RRs were not statically significant. Adjusting for socio-demographic factors, the RRs by occupation decreased by 16% and 4% on average in men and women, and by 4% and 6% when adjusting for smoking, but remained statistically significant.

Conclusions The results suggest the presence of occupational exposures to lung carcinogens in addition to non-occupational factors. Longer follow-up and analysis by histological types of lung cancer are needed to improve the estimates of occupational lung cancer.

O-303 THE ROLE OF OCCUPATIONAL EXPOSURES IN LUNG CANCER RISK AMONG WOMEN: PRELIMINARY RESULTS FROM A POOLED CASE-CONTROL STUDY OF LUNG CANCER

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Introduction Lung cancer is the most common cause of cancer death among women. However, little is known regarding occupational risk factors for lung cancer in women.

Objective To investigate possible associations between selected occupational agents and lung cancer risk among women.

Methods We pooled data from ten case-control studies of lung cancer with detailed lifetime occupational and smoking history. The current analysis was restricted to working women, including 3040 cases and 4186 controls. To assess occupational exposure, we used the Canadian Job-Exposure Matrix (CANJEM). Linking participants' jobs to the CANJEM allows the estimation of probability, and frequency of exposure to a list of 258 agents. This analysis was restricted to 36 most prevalent occupational agents in our sample of women. The association between lung cancer risk and lifetime ever exposure, duration of exposure, and cumulative exposure for each agent was estimated in separate logistic regression models, adjusted for smoking and other selected covariates.

Results Most agents we examined were not associated with lung cancer. We observed an increased risk of lung cancer among women occupationally exposed to cooking fumes for over 10 years (OR(95%CI)=1.73(1.09–2.82)). Statistically significant decreased risks of lung cancer were observed among women exposed to various textile fibres, especially among long-duration workers. The results regarding the various textile agents have not been mutually controlled yet. When restricting to never smokers, increased risks of lung cancer were observed among women exposed to metallic dust, isopropanol, and aliphatic alcohols, with OR point estimates for ever exposure ranging from 1.5 to 1.7.

Conclusion Our preliminary results indicate that occupational exposure to cooking fumes is associated with an increased lung cancer risk in women, while exposures to various textile fibres seem to be associated with a decreased lung cancer risk.

O-321 EXPLORATION OF OCCUPATIONS AS RISK FACTORS FOR LUNG CANCER IN MULTIPLE EXPOSURE HIERARCHICAL AND PENALIZATION MODELS

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Introduction We used hierarchical and penalization models to explore occupational risks associated with lung cancer while accounting for exposures to multiple known carcinogenic exposures.

Methods We pooled lung cancer case-control study subjects from 14 European and Canadian studies. Associations between employment in 1,506 five-digit ISCO-68 occupations and lung cancer were screened using Bayesian hierarchical and lasso penalized regressions accounting for age, smoking, sex, study, and fully quantitative exposures to six known occupational lung carcinogens: asbestos, chromium, diesel engine exhaust, nickel, PAHs, and silica. False positive findings in the penalization model were controlled using stability selection with specified family-wise error rates. Lung cancer odds ratios for selected occupations were calculated using unconditional logistic regression model with identical covariates.

Results Our study included 16,901 cases and 20,965 controls. Jobs selected by the hierarchical and penalization models were similar. Occupations with positive associations with lung cancer after controlling for the known carcinogens included building painters (OR: 1.40; 95 CI: 1.17, 1.67), carpenters (OR: 1.77; 95 CI: 1.36, 2.33), and paviours (OR: 3.91; 95 CI: 1.75, 9.61).

Conclusion We demonstrated viable agnostic approaches in identifying employment risk factors for lung cancer. Future work involves investigations of factors that contribute to the observed elevated cancer risks.

O-335 OCCUPATIONAL PHYSICAL ACTIVITY AND LUNG CANCER RISK AMONG FOUR COHORTS OF THE CANADIAN PARTNERSHIP FOR TOMORROW'S HEALTH PROJECT

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Introduction Recreational physical activity (PA) has been associated with reduced lung cancer risk. Occupational-related PA may be one of the most important sources of PA, but the few studies that have examined the occupational PA-lung cancer relationship have produced inconsistent result.

Objective To investigate the association between occupational PA and lung cancer risk.

Methods A case-cohort study was nested among four cohorts of the Canadian Partnership for Tomorrow's Health Project. Through linkage of each cohort to their respective provincial cancer registry, 453 incident lung cancer cases diagnosed between 2009 and 2016 were identified; a random sub-cohort of 2,435 participants was sampled at baseline. Data on the longest-held job and risk factors were gathered via a harmonized questionnaire. Using a database generated by our team on the energy expenditures associated with almost 3,600 job titles, metabolic equivalent of tasks (METs) were assigned to the longest-held job of each participant. In total, 335 cases (139 men; 196 women) and 2,320 sub-cohort members (879 men; 1,441 women) with assignable job codes and MET values were included in this analysis. Multivariable logistic regression models, with normal or robust variance estimators, were used to estimate study-specific odds ratios (ORs) and 95% confidence intervals (CIs) for the relationship between occupational PA (categorized in tertiles) and lung cancer risk, while