

to take steps to protect the physical therapists, such as separating the offices of physical therapist from the treatment areas, installing protective facilities in the workplace, and using PPE where necessary.

Poster Presentation

Psychosocial

0058 ACCURACY OF A SINGLE ITEM ON MENTALLY TIRING WORK AS PROXY MEASURE OF JOB DEMANDS AND EFFORTS IN THE GAZEL COHORT

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Objective Comparing the accuracy of single item about mentally tiring work against validated scales, Demand-Control (DC) and the Effort Reward Imbalance (ERI).

Methods We analysed data from the Gazel cohort, where a question about mentally tiring work was administered simultaneously with the DC (in 1997 and 1999) and ERI (in 1998) scales. Correlation and accuracy were studied comparing this single question (8 categories, and recoded into 2 or categories) with DC and ERI scales (without and with recoding into 2 categories based on usual threshold), using sensitivity, specificity, predictive values, and likelihood ratio.

Results For the years considered, 5706 (1998) to 11 304 (1997) workers had responded to the questionnaires. The demand and effort dimensions were moderately correlated with the mentally tiring work question showing a good sensitivity (>0.8), and a negative likelihood ratio (<0.33), with a possible dose-response-relationship. Specificity and positive likelihood ratio were low (respectively <0.5 and <2). Job control, Job strain and ERI were not captured by mentally tiring work, and reward only partly.

Conclusion Though a single question does not replace validated scales as the DC and the ERI scales, these results indicate that it would be possible to use simple measures in questionnaires and non-specialised cohorts for screening purpose.

Oral Presentation

Burden of Disease

0059 A GLOBAL PERSPECTIVE ON COAL-FIRED POWER PLANTS AND LUNG CANCER MORTALITY

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Background Lung cancer is the leading cause of cancer mortality in many countries and leads to substantial financial burden globally. The lack of consideration of the widely diverse compositions of particulate matter (PM) may lead to inaccurate

estimation and inability to capture respective contributions as current estimates.

Methods Age- and sex-adjusted lung cancer mortalities of 61 countries were followed from 1979 to 2013 while 10-year-accumulative coal capacities is the primary independent variable. We applied a change-in-change model to estimate the preventable deaths of lung cancer from the changes of coal capacities during periods from 1999–2003 to 2009–2013, adjusting for various socioeconomic, demographic determinants, and lag period.

Results The average log coal capacity increased from 9.58 in 1980 to 10.35 in 2010, and smoking prevalence dropped by 13.82% among males in the same period. One log coal capacity (unit: logMW) was associated with an increase in lung cancer mortality by 58.31 per million males (SD=28.49, $p<0.05$); while the savings from decreasing smoking prevalence was only 4.86 per million males (SD=0.03, $p<0.05$). Based on the model, we estimated a total of 123.68 thousand lives could be saved from lung cancer among 3477 million males in 2011.

Conclusion This study answered a key policy question on the externality cost of coal power plants and estimated global disease burden from preventable lung cancer attributable to coal-fired power plants. By changing a nationwide energy matrix from brown energy to green, some European countries have prevented lung cancer mortality among males successfully.

Poster Presentation

Shift Work

0062 "ROTATING SHIFT WORK AND METABOLIC SYNDROME AMONG EMPLOYEES WORKING IN TERTIARY CARE HOSPITAL IN SOUTHERN INDIA"

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Background Metabolic syndrome and shift workers are on the rise. There is conflicting evidence whether shift work predisposes to development of metabolic syndrome.

Objectives To study the prevalence of metabolic syndrome among shift and daytime workers in a South Indian hospital and to assess the association between shift work and metabolic syndrome.

Methodology The study had 2 groups: shift and daytime workers between ages 25–50 years. The sample size calculated was 79 in each group to demonstrate 12.5% difference in the prevalence of metabolic syndrome with a power of 80% and α error of 5%.

The primary outcome studied was the prevalence of metabolic syndrome and secondary outcomes studied were the odds of developing metabolic syndrome among shift workers. Chi square test was used to measure the difference in the categorical variables; independent student t test for mean difference in the continuous variables. Univariate analysis and multivariable logistic regression were used to test the significance of relevant variables on metabolic syndrome.

Results We studied 80 shift and 80 daytime workers. Baseline characteristics were different for the following parameters: daytime workers were older, had more vegetarians, better

sleep and were less physically active. Metabolic syndrome prevalence was 33.1% among the participants. The adjusted odds ratio for the shift workers to develop metabolic syndrome was 0.55 (95% CI 0.24–1.29) with a P value of 0.17. **Conclusion** Metabolic syndrome was present in every third person among the study participants and there was no significant association with shift work.

Poster Presentation

Intervention Studies

0063

A LITERATURE REVIEW OF WORKPLACE INTERVENTIONS WITH RESPECT TO RISK MANAGEMENT MEASURES AND THEIR IMPACT ON OCCUPATIONAL EXPOSURE LEVELS TO HAZARDOUS SUBSTANCES

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Background and aims: Workplace intervention studies play an important role in supporting and complementing scientific validation of non-intervention assessments of the effectiveness of risk management measures (RMMs) under controlled conditions. We are reviewing a collection of published workplace intervention studies with particular focus on studies assessing changes in occupational exposure to hazardous substances with a broad scope spanning a variety of approaches in different industries.

Methods Workplace interventions were defined as events aimed at reducing occupational exposure to hazardous substances at the workplace or where reductions occurred as a side effect, e.g. due to changes in the production process. Intervention studies published in English from 1999 up to January 2017 were considered for inclusion based on a systematic search of Pubmed.

Results In total 50 intervention studies have been included in this review including, but not limited to, studies in the metal industry (10), hospitals (4), bakeries (3), on welding (6), or dust in construction (4). Overall the interventions reviewed have succeeded at reducing exposure levels.

Conclusion There is evidence that decreases in workplace exposure levels to hazardous substances followed a variety of workplace interventions in a variety of industries underlining the benefits of implementing RMMs at workplaces. However, a direct comparison of a specific RMM among different studies, even when focussing on one specific industry, remains difficult as the majority of studies assessed a set of different RMMs; hence the quantification of the impact of individual interventions on exposure remains difficult due to the heterogeneity in methods.

Oral Presentation

Shift Work

0064

OBJECTIVELY MEASURED NON-OCCUPATIONAL AND OCCUPATIONAL PHYSICAL ACTIVITY LEVELS OF SHIFT WORKERS COMPARED TO NON-SHIFT WORKERS

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Background Shift work may alter workers' physical activity (PA) level, making PA a potential underlying mechanism of the negative health effects of shift work. As prior studies on shift work and PA have generally used self-reported, overall PA measures, the results may be susceptible to bias. Therefore, our aim was to compare objectively measured non-occupational and occupational PA levels between shift workers and non-shift workers.

Methods Data were used from Klokwerk+, a prospective cohort study examining the health effects of shift work among health care workers. In total, 401 rotating and/or night shift workers and 78 non-shift workers were included, who wore Actigraph GT3X+ accelerometers for 7 consecutive days. Time spent sitting, standing, walking, running, stairclimbing, and cycling during leisure and at work was estimated using Acti4-software. Linear regression was used to compare proportions of time spent in these activities between shift and non-shift workers.

Results Average accelerometer wear-time was 105.9 hours (SD=14.0) over an average of 6.9 days (SD=0.6). No differences between shift workers and non-shift workers were found in PA behaviours during leisure-time ($p>0.05$). At work, shift workers were less sedentary ($B=-10.6$ (95%-CI=-14.3–6.8)) and spent larger proportions of the time standing ($B=9.5$ (95%-CI=6.4–12.6)) and walking ($B=1.2$ (95%-CI=0.1–2.2)) than non-shift workers.

Conclusions Non-occupational PA levels of shift workers were similar to that of non-shift workers, but shift workers were more physically active (i.e. standing/walking) at work. Future research should focus on the role of this difference in occupational PA in the health effects of shift work.