

quantities such as differences in contrasts to compare different grouping schemes for applications in epidemiology. We illustrate the approach via simulation study based on a representative range of settings found in occupational epidemiology.

Oral Presentation

Psychosocial

0331 PROLONGED PERCEIVED STRESS AND SALIVA CORTISOL IN A LARGE COHORT OF DANISH PUBLIC SERVICE EMPLOYEES: CROSS-SECTIONAL AND LONGITUDINAL ASSOCIATIONS

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Objectives The effects of prolonged stress on cortisol secretion is uncertain. This study examines the cross-sectional and longitudinal associations between prolonged perceived stress and salivary cortisol.

Methods In 2007, 4,467 Danish public service employees participated in a study of stress and mental health, and 3,217 participated in a follow-up in 2009. Perceived stress during the past four weeks was assessed by Cohen's four item Perceived Stress Scale. Participants were asked to collect saliva 30 minutes after awakening and at approximately 20:00 in the evening. The cortisol dependence on perceived stress was examined in regression analyses adjusted for effects of potential confounders. We adjusted for a large variation in saliva sampling times by modelling the time trajectory of cortisol concentrations in the morning and in the evening and examined if they were influenced by perceived stress.

Results Perceived stress had no statistically significant effects on the level or time trajectory of morning or evening cortisol, neither cross-sectionally nor longitudinally. The one month prevalence of frequently perceived stress was low, approximately 2.5%.

Conclusions Our results did not support the hypothesis that prolonged perceived stress is associated with the level or time trajectory of morning or evening salivary cortisol.

Oral Presentation

Psychosocial

0332 THE IMPACT OF ORGANISATIONAL CHANGE ON SICKNESS ABSENCE: HOW MUCH OF THE EFFECTS ARE MEDIATED BY WORKPLACE SOCIAL CAPITAL?

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Objective Organisational change may negatively affect employees' health and social capital. This study examined the magnitude of mediated effects from organisational change through social capital on long-term sickness absence (LSA) among public hospital workers.

Method In March 2014, 26,209 workers employed through January-December 2013 in the Capital Region of Denmark received a work-environment survey assessing social capital (84% responded). Social capital, measured using 8 self-reported items (collaboration, trust, and organisational justice) ranging 0-5/0-7 (low-high), was aggregated on work-unit level and categorised into quartiles. Organisational change (e.g., merger, layoff(s), and relocation) during July-December 2013 were recorded via surveys sent to all managers (58% responded). Monthly sickness-absence data of 2014 were obtained from regional salary registries (LSA:>28 days). Mediation was assessed using natural effects models nested on January-September 2014 and estimated the natural direct, indirect, and total effects from organisational change on LSA via social capital adjusting for age, gender, work-unit size, occupation, child- and health-proxies.

Results Exposure to merger or layoff(s) yielded significant adverse direct effects (OR 1.33, 95% CI 1.12–1.58 and OR 1.15, 95% CI 1.01–1.30, respectively) and adverse indirect effects via social capital (OR 1.04, 95% CI 1.02–1.06 and OR 1.04, 95% CI 1.03–1.05, respectively) on LSA (total effects: OR 1.38, 95% CI 1.17–1.64 and OR 1.19, 95% CI 1.05–1.36, respectively).

Surprisingly, exposure to relocation showed a *protective* direct effect (OR 0.73, 95% CI 0.58–0.91), but a significant adverse *indirect* effect (OR 1.01, 95% CI 1.00–1.03) on LSA (total effect: OR 0.74, 95% CI 0.52–0.92).

Conclusion Social capital potentially mediates adverse effects from organisational change on LSA.

Oral Presentation

Shift Work

0333 NIGHT SHIFT WORK AND BREAST CANCER RISK: A COMBINED ANALYSIS OF POPULATION-BASED CASE-CONTROL STUDIES WITH COMPLETE WORK HISTORIES

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In 2007, IARC classified "shift work that involves circadian disruption" as probably carcinogenic to humans. To date, the evidence that night shift work increases the risk of breast cancer remains limited, partly because exposure to night work is defined differently across studies. To overcome this limitation, we created a single harmonised dataset using a common definition of night work from 5 major population-based case-control studies on breast cancer in Australia, Canada, France, Germany, and Spain.

The dataset included 6000 breast cancer cases and 7000 population controls. Any job held during work history that included at least 3 hours between midnight and 5 am was classified as night work. Lifetime duration of night work, frequency (nights/week), and night shift length (hours) were used as the main exposure variables.

In pre-menopausal women who ever worked at night the pooled OR was 1.23 [1.03–1.47]. The OR increased to 1.75 [1.17–2.62] in premenopausal women who worked at least 3 nights/week and 1.33 [1.05–1.70] for night shifts ≥ 10 hours. The OR did not increase with the number of years of night work, but women who worked ≥ 3 nights/week for ≥ 10 years had an OR of 2.58 [1.05–6.36]. No association emerged from the data in post-menopausal women. No statistically significant heterogeneity between studies was observed.

Our results support the hypothesis that night work increases breast cancer risk, particularly in pre-menopausal women who worked at least 3 nights per week. The absence of an association in post-menopausal women needs further scrutiny.

Poster Presentation

Chemicals

0335 TNF- α GENE POLYMORPHISMS MAY BE ASSOCIATED WITH INTERACTIVE EFFECTS OF BLOOD MULTI-ELEMENTS IN METAL INDUSTRIAL WORKERS

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Chronic exposure to metals or toxic elements may contribute to many diseases. Lead (Pb), cadmium (Cd), and arsenic (As) were toxic agents in the environment. Selenium (Se), cobalt (Co), copper (Cu), and zinc (Zn) are essential trace elements for human, but they may do harm to health beyond normal concentrations. The interactions among multiple elements are complicated and remain unclear. Toxic elements may cause a threat through inflammation. Tumour necrosis factor- α (TNF- α) is an important mediator of inflammation, and several single nucleotide polymorphisms (SNPs) have been identified in the human TNF gene promoter. Our aim is to analyse how TNF- α gene polymorphisms and multi-elements interaction influence serum TNF- α level. A total of 462 metal industrial workers who have received health examination in Kaohsiung Medical University Hospital were recruited. The blood samples were sent for biochemical analyses, TNF- α genotype analyses (–238G>A, –308G>A, –857C>T, –863C>A, –1031T>C), and measurement of blood multi-elements concentrations (Pb, Cd, As, Se, Co, Cu, Zn) and serum TNF- α level. Mixed-effect models were used for analysing complex interactions of multi-elements and multiple TNF- α SNPs. All elements have positive correlation with serum TNF- α level, and the effects may be modified by TNF- α gene polymorphisms. Interactions between TNF- α gene polymorphisms and multi-elements may influence serum TNF- α level. We suggest that the workers with susceptible TNF- α genotypes which may induce higher serum TNF- α level should pay more attention to metal toxicity.

Oral Presentation

Ageing Workforce

0336 IMPACT OF JOB GROUP ON RISK OF RETIREMENT IN DENMARK 1980–2012

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