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.

Oral Presentation

Risk Assessment

0065 SLEEP QUALITY AMONG HEALTH SCIENCES STUDENTS LIVING IN DORMITORY

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Introduction Sleep disturbances have been associated with an increased risk of health problems among higher education students. The purpose of this survey was to determine the prevalence and identify the factors that influence the sleep quality in dormitory students.

Materials and Methods We applied a descriptive and cross-sectional survey. The participants consisted of 249 health sciences students at Semnan University of Medical Sciences. Data were collected through a self-reported reliable and validated questionnaire.

Results the students aged 21.7 ± 1.1 years. In overall, 80.7% of female and 72.1% of male students revealed insufficient sleep. Mental engagement commonly reported as a frequent risk factor for sleep disturbance (53.8%). Uncomfortable sleeping environment in dormitories ($p=0.03$) and behaviours that cause arousal till midnights ($p=0.05$) were significantly associated with poor sleep quality. Approximately half of students perceived daytime somnolence as sleep disorder consequence.

Conclusion Our results indicated high prevalence of poor sleep quality among university students. Sleep disorders should be considered a major health concerns among dormitory students. Providing better environmental conditions, training and advisory programs may help to improve students' sleep quality and academic achievement.

Oral Presentation

Cancer

0066 MATERNAL OCCUPATIONAL EXPOSURE TO BENZENE INCREASES THE RISK OF CHILDHOOD LEUKAEMIA IN OFFSPRING – A PROSPECTIVE STUDY IN THE NORWEGIAN MOTHER AND CHILD COHORT STUDY

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Introduction There is an established causal relationship between benzene exposure and acute myelogenous leukaemia in adults, but the association between parental benzene exposure and childhood leukaemia in offspring remains inconclusive.

Objective Using the prospective population-based Norwegian Mother and Child Cohort Study (MoBa) comprising 1 13 754 offspring (1999–2009), we investigated the association between parental exposure to "gasoline or exhaust" as a proxy to benzene exposure and childhood leukaemia.

Method Around the 17th gestational week mothers and fathers responded to questions on a range of occupational exposures during the last 6 months and pre-conception, respectively. Exposure to benzene was assessed through self-reported exposure to "gasoline or exhaust" ("never exposed", "ever exposed" and "exposed >30 days"), the latter interpreted as being occupational. Development of subsequent childhood leukaemia ($n=70$) were identified through linkage with the Cancer Registry of Norway. The risk was estimated by odds ratios (OR) with 95% confidence intervals (95% CI) comparing the offspring from exposed and unexposed parents using a logistic regression model, adjusting for maternal smoking and birth weight.

Results Maternal exposure was associated with an increased risk of childhood leukaemia (OR 2.6; 95% CI 1.03, 6.50). The risk increased with number of days being exposed during the last 6 months categorised in "0", "1–30", "31–180" (p -value for trend = 0.03). No excess risk of leukaemia was found for paternal exposure.

Conclusion We found an excess risk of leukaemia in children having a mother reporting being exposed to benzene-containing "gasoline or exhaust" prior to and/or during pregnancy.

Oral Presentation

Migrant Workers

0068 USING WORKERS COMPENSATION DATA TO ESTIMATE INJURY PATTERNS IN INTER-PROVINCIAL WORKERS

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Background The western Canadian province of Alberta attracts skilled workers from across Canada to work in the oilfields. We investigated whether information from Workers Compensation Board (WCB) claims would provide unbiased estimates on the rate of injury in such migrant workers. Work injuries in Alberta are compensated by the Alberta WCB regardless of province of residence.

Methods The Alberta WCB provided claims data with home province, sex, age, industry and time lost from work. Denominator data came from Statistics Canada, linking census and taxation information. We also recruited a cohort of workers in Fort McMurray, the hub city for oil and gas, and followed them for 4 months to record work injuries.

Results From Statistics Canada, we had 1,720,716 people working in Alberta in 2012 whose home was Alberta and 10403 whose home was Newfoundland. The overall rate of injury (with no correction possible for days employed) was lower in the migrant workers, after adjustment for age, sex and industry. Within claims, the pattern of time loss differed importantly: those from Newfoundland had a marked deficit in claims with time loss 1–28 days (OR = 0.18; 95% CI 0.12–0.27). WCB reporting among the 151 cohort members was lowest among those from out of province or recently settled: overall only 38% of loss time injuries were reported. Those in precarious employment were more likely to self-medicate or quit their job to avoid being labelled with a history of injury.

Conclusion Injury risk in inter-provincial workers could not be estimated using only WCB data.