

RF-103 DETERMINANTS OF SLEEP PATTERNS IN HEALTH CARE PROFESSIONALS WORKING PERMANENT NIGHT SHIFTS OR ROTATING DAY SHIFTS: A MULTIVARIATE ANALYSIS BASED ON ONE-WEEK SLEEP DIARIES AND SENSOR DATA

¹Pascal Guenel, Emilie Cordina-Duverger, Brice Faraut, Julia Brettschneider, Bärbel Finkenstädt-Rand, Damien Léger, Yiyuan Zhang, Guillen Aristizabal, René Adam, Francis Levi, Amal Attari. ¹INSERM, France

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Introduction Night shift and rotating shift work schedules are associated with mismatch between sleep-wake cycle and circadian rhythms, leading to sleep disturbances and adverse health effects. The impact on health and sleep patterns of shift work schedules among health care professionals working in public hospitals in Paris has been a matter of concern.

Objectives To investigate the effect of shift work schedules on sleep patterns among healthcare professionals working either as permanent night shifters (NS) or as day shifters (DS) with rotating morning and afternoon shifts.

Methods Study participants included 95 NS and 105 DS who completed a questionnaire on work history, lifestyle, sleep disorders, and job strain. Sleep and work hours were extracted from self-completed sleep diaries during a full work week. Periods of rest or activity were determined from a chest-worn sensor (PICADO[®]) in 63 NS and 77 DS, using a hidden Markov model. Determinants of sleep patterns were investigated using linear mixed models.

Results According to sleep diaries, NS had both a shorter sleep duration during work days compared to DS (5.4 h ± 1.5 vs 6.8 h ± 1.2), and a greater sleep debt over the study week (3.2 h ± 1.9 vs 1.4 h ± 1.5). The total duration of rest periods determined from the sensor was greater than the total sleep duration, particularly among NS (8.3 h ± 1.7). In addition to shift type, older age, chronotype with morning preference, high BMI and job strain were found to be independently associated with shorter duration of sleep and rest periods.

Conclusion Shift work schedules among health care professionals may lead to sleep deprivation, which may be mitigated by taking longer periods of rest bouts, particularly in permanent NS. Time slots allowing for rest periods during work hours are important to prevent health consequences of sleep disorders in these workers.

RF-104 DURATION OF NIGHT SHIFT WORK IS ASSOCIATED WITH AGE ACCELERATION IN HYPERSUSCEPTIBLE FEMALE NURSES

¹Michele Carugno, Eleonora Crespi, Vincenzo Ruggiero, Paola Monti, Valentina Bollati, Angela Cecilia Pesatori, Cristina Maggioni. ¹University of Milan, Italy

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Introduction Disruption of age-related processes seems to play a relevant role in health effects related to night shift (NS) work. We had observed a decrease between telomere length (a marker of aging) and number of years in NS in subjects employed in NS ≥12 years.

Objectives We now investigate the association between NS work and biological age (BA) estimated through an epigenetic

signature based on methylation of five CpG sites in ELOVL2, C1orf132, TRIM59, KLF14 and FHL2 (Zbieć-Piekarska et al., 2017).

Methods Forty-six female nurses employed in NS for at least two years were matched by age (30–45 years) and length of service (≥1 year) with 51 female colleagues not working in NS. Each subject filled in a semi-structured questionnaire [including the Effort Reward Imbalance (ERI) index to assess job stress] and gave a blood sample. We applied linear regression models adjusted for BMI, ERI, and smoking habit and performed stratified analyses to investigate effect modifiers. We estimated age acceleration by regressing biological age on chronological age and taking the residuals.

Results Working in NS and number of years in NS were not associated with BA in the overall population. Overweight/obese subjects showed an increase in age acceleration per each year in NS [0.46 (0.05; 0.87), p = 0.030, p for interaction = 0.097] as well as subjects exposed to occupational stress (ERI >1) [0.58 (0.10; 1.06), p = 0.018, p for interaction = 0.056]. Interestingly, we observed a higher age acceleration [0.66 (0.03; 1.29), p = 0.041] when considering both categories combined, even if no formal interaction was apparent.

Conclusion Although hampered by the small sample size, our findings suggest a relationship between age acceleration and number of years in NS in hypersusceptible workers, i.e. overweight/obese or exposed to occupational stress.

RF-142 NIGHT WORK CHARACTERISTICS AND INCIDENCE OF CORONARY HEART DISEASE: EXPOSURE-RESPONSE RELATIONS

¹Jesper Medom Vestergaard, Annett Dalbøge, Jens Peder Ellekilde Bonde, Anne Helene Garde, Åse Marie Hansen, Johnni Hansen, Ann Dyreborg Larsen, Henrik Albert Kolstad, Mikko Härmä. ¹Aarhus University Hospital, Denmark

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Introduction Increasing years of recent rotating night shift work has been associated with increasing risk of coronary heart disease among nurses.

Objective We examined the association between numbers of monthly night shifts, other quantitative night work characteristics and coronary heart disease among nurses, physicians and other health care workers with the aim to provide evidence based recommendations for night work schedules.

Methods In a register-based national cohort study with a 2007–2015 follow-up, we followed 100,593 night workers (80% women) and 158,084 day workers (78% women) employed at public hospitals in Denmark. We defined a night shift (≥3 hours between 12am and 5am) and different quantitative night work characteristics (i.e., number of monthly night shifts, cumulative night shifts, years with rotating night shifts, years with any night shift and consecutive night shifts) from day by day payroll information on work hours from the Danish Working Hour Database. Outcome was first time hospital admission for coronary heart disease. At end of follow-up a subgroup of 34,432 participants reported lifestyle factors i.e. tobacco smoking, alcohol consumption, body mass index and prior regular night work.

Results During follow-up, 1203 night workers (68% women) and 2219 day workers (66% women) were diagnosed with

coronary heart disease. Among night workers, we observed no consistent exposure-response relations for any quantitative night work characteristic. However, men, but not women night workers showed an overall increased incidence rate ratio of coronary heart disease of 1.22 (95% confidence interval 1.07–1.39) compared with dayworkers that could not be explained by medical or lifestyle factors.

Conclusion Our observation of no exposure-response relation between several quantitative night work characteristics and coronary heart disease does not provide support for an association between night work and coronary heart disease warranting specific night work schedules to prevent coronary heart disease.

RF-187 NIGHT SHIFT WORK INCREASES THE RISK OF DIABETES: A 17-YEAR FOLLOW-UP COHORT STUDY AMONG ASIAN HEALTHCARE WORKERS

¹Wan-Chin Chen, Hsiao-Yu Yang. ¹National Taiwan University College of Public Health, Taiwan

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Introduction In East Asian countries with highly developed economies, the prevalence of diabetes is rapidly increasing. Long working hours and shift work are suspected to be important risk factors in East Asia. A long-term follow-up study is warranted to clarify the relationship between diabetes, working hours, and shift work.

Objectives To evaluate the association of night shift work and risk of diabetes among Asian healthcare workers, and to explore their dose-response relationship using actual hours of night shift work monthly rather than cumulative years with night shift work.

Methods A retrospective cohort study was conducted among employees in a tertiary medical centre in central Taiwan. From 2002–2019, there were 7767 participants with a mean (\pm SD) age of 27.9 (\pm 7.0) years, and 89.6% of them were women. We collected information related to annual health check-ups, medical charts, and annual working hours, including during day, evening, and night shifts. We divided working hours into three categories (less than 60 hours per month, 60 to 100 hours per month, more than 100 hours per month). We estimated hazard ratios and 95% confidence intervals (CIs) for incident diabetes using Cox proportional hazards models, adjusting for age, sex, and body mass index.

Results 309 (3.98%) incident cases of diabetes occurred during 56,799 person-years at the 17-year follow-up. In the age- and sex-adjusted model, the HR (95% CI) for those who worked night shifts for more than 100 hours per month was 2.062 (1.179 to 3.608) compared with those who worked fewer than 60 hours. In the stratified analysis, the association between night shift work and diabetes was significant among those aged <40 years, females, and obese participants.

Conclusions Among Asian healthcare workers, night shift work is associated with the incidence of diabetes in a dose-dependent manner. This finding could identify workers at high risk of diabetes to provide preventive strategies.

Work organization and Return to Work

RF-37 ASSOCIATION BETWEEN MENTAL HEALTH SYMPTOMS AND SHIFTWORK AMONG FILIPINO WOMEN FACTORY WORKERS

¹Jinky Leilanie Lu, Sophia Francesca Lu. ¹National Institutes of Health, University of the Philippines, Philippines

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Introduction This study aimed to look at the association between working at night and mental health symptoms, and mediating factors to this association.

Methods This study looked at a database of 500 factory workers, about 90% of which were females. It originally investigated hazard exposures and occupational health of workers in export processing zones in the Philippines. The database included variables relating to work schedule such as night shift, overtime, and extended work, as well as mental and psychological health indices through a survey questionnaire.

Results The study showed that work schedule, work load and occurrence of mental health symptoms are associated with night schedule. The crude odds ratio for the association between shift schedule and frequency of occurrence of mental health symptoms is 2.13 (0.77–5.81). This means that without adjusting for confounders, those who work in the evening are 2.13 times more likely to have frequent occurrence of mental health symptoms as compared to those who work in the morning. Specifically, among females, those who work at night are 2.97 times more likely to have frequent occurrences of mental health symptoms compared to those who work in the morning. Those who are frequently exposed to occupational hazards are 5.78 (1.17–28.71) times more likely to have frequent mental health symptoms as compared to those who are not. The evidence for this association is strong.

Conclusion The study has shown that among Filipino women factory workers, nightshift work is associated with mental health symptoms.

RF-182 ADOLESCENT TRAINEES WITH LEARNING DISABILITIES ON OCCUPATIONAL HEALTH AND SAFETY: PERCEPTION OF RISKS AND GENDER DIFFERENCES

¹Myriam Bérubé, Marie Laberge, Aurélie Tondoux. ¹University of Montreal, Canada

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Introduction Adolescents with learning disabilities are vulnerable in terms of occupational health and safety (OHS). The Quebec Work-Oriented Training Path (WOTP) prepares them for the job market by offering pre-employment internships. Those are often typically feminine or masculine, and attract students according to their gender stereotypes. This segregation implies different OHS risks for women or men, who have chosen different environments. Considering this complex context, a research team is developing digital tools to improve the OHS management in the WOTP.

Objectives The first step is to identify what students currently understand about OHS, the risks present in their internships, and how gender influence these elements.