Introduction Sleepiness during work hours is the most common complaint of night shift workers, and is a sensitive indicator of performance decrements. Sleepiness levels vary between individuals, yet few have investigated individual factors as predictors of night shift sleepiness, and these have shown mixed results. We aimed to examine the effects of bio-psycho-social factors on subjective sleepiness of nurses during the night shift.
Methods Female nurses (n=119) working irregular rotating shifts were recruited from two hospitals in Northern Israel, using convenience sampling by clusters. Inclusion criteria were working at least 75% of full time, with at least one night shift per week. Exclusion criteria were pregnancy, a diagnosed sleep disorder, and/or chronic medical conditions. Subjective sleepiness was measured hourly during two night shifts using the Karolinska Sleepiness Scale (KSS). Sleep was monitored by actigraphy 24 hours before and until the end of the night shifts. Participants completed a socio-demographic questionnaire, the Munich ChronoType Questionnaire for Shiftwork ($MCTQ^{shift}$), the Pittsburg Sleep Quality Index (PSQI) and the Pre-Sleep Arousal Scale (PSAS).
Results Mixed models stepwise analyses found main effects for hour, age, cognitive pre-sleep arousal and number of children on nighttime sleepiness (all $p<0.01$). Effects of chronotype on sleepiness were inconsistent. Interactions were found for age*number of children ($p<0.01$), pre-sleep cognitive arousal*-chronotype ($p<0.05$), and age*chronotype ($p=0.06$). Older nurses were less sleepy than younger nurses, but this impact was attenuated by early chronotype and having more children. High cognitive pre-sleep arousal, but not sleep, predicted increased sleepiness, especially in nurses with late chronotype.
Discussion The impact of bio-psycho-social factors on night shift sleepiness is complex and depends on mutual interactions between these factors. Nurses who are young, late chronotypes and with high cognitive pre-sleep arousal require special attention and support, and must develop personal strategies for maintaining vigilance on the night shift.

1602d BREAST CANCER AND SHIFT WORKING IN A LIGHT POLLUTED WORLD

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Introduction Breast cancer (BC) is increasing worldwide together with light pollution (LP) emerging from various outdoor and indoor sources. Results of different studies including our research centre report on the relations between BC-incidences and exposure to Artificial Light at Night (ALAN). The trend for energy saving-ALAN increases the problem, as light intensity is increasing and mainly that of short wavelength (SWL), within the blue part of the spectrum (450–500 nm). Our master biological clock, located in the hypothalamus, entrained by light/dark cycles is in charge of our temporal organisation from cell functions. It is not only light-intensity, which changes with the 24 hour cycles, but also the dominant parts of the light spectrum, which reach's earth. Those dominant parts, signalling for daytime are the SWL, including those between 450–500 nm a range known as an efficient suppressor of the nocturnal pineal produced hormone Melatonin (MLT). We attempted to study the nexus: ALAN, MLT-Suppression, epigenetic modifications and BC-cells proliferation in subcutaneously inoculated female mice.
Methods Mice were acclimated for two weeks under 8L:16D, at a constant ambient temperature testing various sources of illumination differing in spectrum composition. After inoculation, we exposed mice to ALAN of the same illumination of daytime. We measured the following variables: Body mass, tumour volume, MLT-production and levels of Global DNA methylation (GDM) levels.
Results We revealed the existence of the proposed nexus. Response to ALAN is depended on the wavelength illumination source. SWL-illumination bulbs as white-LED or compact florescent have a higher negative effect compared with that of incandescent or carbon bulbs. We emphasise a relation between tumour volume, level of MLT-suppression and GDM-levels.
Discussion We suggest that human populations under increasing LP-levels of SWL-illumination are in a high risk for becoming BC-patients, it should be of great interest to set the threshold for exposure to SWL-illumination and BC-risk.

1602e CAN ON-SHIFT NAP BENEFIT NIGHT WORKERS' HEALTH? STUDIES ON BLOOD PRESSURE AND OBESITY IN NURSING TEAMS

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Introduction On-shift napping can benefit night workers as regards sleep deprivation, adjustment of circadian rhythms, and alertness. But possible benefits of nap on health outcomes are scarcely investigated. Considering that night work is pointed as a risk factor for hypertension and obesity, we investigated the possible attenuation of blood pressure and body mass index increase by on-shift napping among nursing teams.
Methods A cross-sectional study was conducted in a public hospital in Rio de Janeiro, Brazil with nursing professionals who were informally allowed to nap for up to three consecutive hours during working nights. Current and accumulated doses of night work (NW) were studied through the number of working nights/2 week-span and years of NW, respectively. Four outcomes were measured using standard equipment and techniques: systolic blood pressure (SBP), diastolic blood pressure (DBP), hypertension (SBP $\geq$140 mmHg or DBP $\geq$90 mmHg or prescription of antihypertensive medication), and body mass index (BMI). The associations between exposure variables and outcomes were based on logistic regressions (hypertension) and generalised linear models (SBP, DBP and BMI).
Results Among non-nappers (but not among nappers), current doses of NW (number of working nights) was significantly associated with increased SBP (β-value=1.39; 95% CI: 0.31 to 2.49) and DBP (β-value=0.80; 95% CI: 0.10 to 1.50), as well as increased odds for hypertension (OR=3.35; 95% CI: 1.74 to 6.57). This association was not observed for accumulated doses of NW. As regards BMI, both current and accumulated doses of NW were significantly associated with increased BMI levels (β-value=0.364 [95% CI: 0.002 to 0.749] and β-value=0.092 [95% CI: 0.011 to 0.173], respectively) only among non-nappers.