Behavior, Cognition and Dreaming
COGNITIVE EXECUTIVE FUNCTIONS AND SLEEP-WAKE CYCLE (SWC) PATTERNS IN SAMPLE OF CHILEAN ADOLESCENTS

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Introduction: In Chile, obesity has quadrupled their prevalence in childhood and adolescence, becoming the most relevant nutritional disease for this age-range (64,5% of the population) in the last 20 years). Some studies have shown an association between poor cognitive performance-in particular executive functions (EF)- and the risk of being overweight. On the other hand, the relationship between sleep-wake cycle (SWC) patterns and weight gain is well established. However, most studies are not based on objective. The porpouse of the study is to assess EF performance and SWC patterns in OW adolescents.
Materials and methods: The participants were adolescents belonging to an infancy cohort. By means of an eye track method the antisaccade reward task was used to assess EF. SWC patterns were established by an automated procedure using motor activity data recorded by an actigraph wore in the non-dominant wrist for a week. Only SWC patterns of the 24-h preceding the morning of EF assessment were used. BMI was calculated (weight (kg)/[height (m)^2]) and nutritional status was classified according to BMI z-score. Main outcomes were: (a) EF: accuracy and latency for correct responses, and b) SWC patterns: bed time, wake-up time, total sleep time, number of nocturnal awakenings and naps number and duration.
Results: 228 participants were assessed (mean age was 16.9 ± 0.20 years and 53% male) and 39% was overweight (OW). Groups presented similar socio-economic and educational data. Compared with normal weight male, OW male showed delayed bedtime ($00:51\pm01:16$ am vs. $00:23\pm01:2$ am, $p\leq0.05$) and longer naps (75.9 ± 54.8 min vs. 54.1 ± 51.7 min, $p\leq0.05$). Logistic regression analyses showed that, taking in account all the subjects, longer reaction time for correct response and delayed bedtime were associated to a greater probability to be OW ($p< 0.01$).
Conclusions: Our results indicate that SWC patterns and lower EF performance in adolescence are associated with OW. Given the consistent evidence that most OW adolescents were already obese at earlier ages, our findings provide further support for the need to include both SWC patterns and EF performance within prevention strategies for obesity prevention in early developmental stages.

Chronobiology/Circadian Disorders
PILOT STUDY TO EVALUATE GENE EXPRESSION PROFILES OF CIRCULATING CELLS IN SHIFT WORKERS WITH AND WITHOUT BREAST CANCER

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Introduction: Breast cancer is the most common cancer in women that account for approximately 23% of all cancer diagnoses. Early diagnosis of breast cancer can improve the chances of successful treatment and recovery. Determining which patients with localized breast cancer are at risk for disease progression and metastatic spread is one of the current challenges to improve breast cancer prognosis.
Materials and methods: In 2007, the International Agency for Research on Cancer (IARC) concluded that shift workers are at a higher risk of developing breast cancer. One existing method for estimating breast-cancer risk is based on personal health history, family health history, and analysis of the presence of BRCA1 or BRCA2 mutations. However, this approach and mammographic screening often fail to obtain an estimated risk that is tailored to each individual. Liquid biopsy that evaluate circulating tumor cells gene expression profiles has recently emerged as a powerful technique for cases of metastatic breast cancer and some evidences highlight that circulating tumor cells could be an avatar of the solid tumor. Therefore, we hypothesize that gene expression profiles changes in peripheral blood mononuclear cells could correlate with breast cancer presence and severity in rotating shift workers. Thus, in order to identify a panel of genes that could reflect in blood what happens in breast we started a pilot study to investigate the expression of a panel of 624 genes in a small group of shift workers with breast cancer compared to rotating shift workers without. For this study we collected peripheral blood mononuclear cells that we used to perform PCR Real-Time OpenArray profiles.
Results: The data obtained from the deepening laboratory and risk stratification in the type of test employed will be crucial in defining an personalized assessment of the occupational risk, with important impacts on a cancer prevention within the work environment by complement to current available screening methods.
Conclusions: Breast cancer is the most common cancer in women with a significant incidence in the general population.. The risk of developing breast cancer increases exponentially with age, particularly because of the accumulation of epigenetic alterations resulting in imbalance in the expression of oncogenes and oncosuppressor genes. This phenomenon is particularly important in the business world where, in recent decades, we have seen a progressive ageing of the working population.
This study could help manage the occupational risk management, in health care and not, with important consequences on

1) primary prevention;
2) early diagnosis and monitoring extended to hyper-susceptible subjects (secondary prevention);
3) the reintegration of individuals with diagnosis of breast cancer (tertiary prevention). Acknowledgments. The authors thank C. Di Felice and C. Tartaglia, who helped in collecting the data.

Other
SEVERE SLEEP RESTRICTION IN EXPEDITION ADVENTURE RACE COMPETITORS

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Introduction: Expedition adventure racing is a multi-disciplinary ultra-endurance team sport in which individuals competitively self-navigate a route along pre-arranged checkpoints in wilderness locations. Events continue over multiple days, and competitors self-manage the frequency and length of rest during the race. As a result, athletes experience severe sleep restriction during the multi-day races, with expected consequences for cognitive and physical functioning. This study aimed to characterise the sleep-wake behaviour and perceived impairment resulting from restriction during two multi-day adventure races completed in 2015.
Materials and methods: Participants were competitors in two separate multi-day expedition adventure races. Nine athletes (8M, 1F, $M_{age} = 38.78$ years) representing three teams took part in the first race in Australia, and 15 athletes (10M, 4F, $M_{age} = 35.36$ years) representing four teams took part in the second race in Alaska. Sleep-wake behaviour was measured via continuous wrist actigraphy pre-race, during the event, and post-race.