early stages OHS (1-2) thanks to the use of capnography, and the clinical and environmental predictive factors within this obese population.
Materials and Methods: In this prospective multi-centric observational study, inclusion criteria were adults patients with obesity without past or current non-invasive ventilation or continuous positive pressure treatment and no recent hospitalization. In this intermediate analysis, OHS prevalence and staging, BMI and associated factors (gender, age, mean peripheral saturation, night-time desaturation < 90% (min and % of total sleep time), arterial blood gases values, SF-36 quality of life measurement, Ricci & Gagnon physical activity assessment, Epworth) were examined from the first 100 patients (67% women).
Results: In these patients, the prevalence of early stage OHS was 6% that is not routinely assessed. Stage 0 were 68% and stage 3-4 17%. Early stage OHS was associated with elevated level and duration of night-time hypercapnia (PtCO2 = 51.62mmHg ±6.88, $P<0.001$; Time PtCO2 > 50 mmHg = 144min ±166, $P<0.001$), hypoxemia (PaO2 = 82.55mmHg ± 14.32, $P=0.015$), lower pH (7.4 ± 0.03, $P=0.0086$) and elevated bicarbonate (HCO3- = 26.05mmol/L ± 0.92, $P<0.001$). No difference on BMI, apnea-hypopnea index, physical activity or Epworth score was found among groups.
Conclusions: These results suggest that the use of capnography recording allowed to determine the existence of early stage OHS which may be of clinical relevance and independent from BMI.
Acknowledgements:

ONE-NIGHT TOTAL SLEEP DEPRIVATION DID NOT ALTER THE EFFECTS OF PAVLOVIAN CUES ON INSTRUMENTAL RESPONSES FOR HIGHLY PALATABLE FOOD REWARDS

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Introduction: Inadequate sleep is a risk factor for obesity. Prior studies suggest that sleep-deprived individuals may consume more calorie-dense food. The mechanisms underlying such change is unclear. The present study aimed to evaluate if sleep deprivation altered the effects of cues on one's instrumental responses for highly palatable food rewards using the Pavlovian-Instrumental Transfer (PIT) paradigm. The PIT paradigm allowed for the evaluation of specific transfer effects, i.e., increased instrumental responding for a food reward in the presence of a conditioned cue associated with that specific food reward, and general transfer effects, i.e., increased instrumental responding for a food reward in the presence of a conditioned cue associated with other food rewards. It was hypothesized that one-night total sleep deprivation would elevate specific and general transfer effects.
Materials and Methods: A within-individual randomized crossover design was used. A sample of 96 healthy adults (mean age = 25.41 years, SD = 8.01, range = 18-51; BMI = 21.41, SD = 3.52, range = 16.61-40.16) were randomized to undergo either one-night total sleep deprivation (TSD) or the normal sleep control (NSD) condition first, followed by a 3-day washout period and the other condition. The PIT paradigm consisted of an instrumental training phase, a Pavlovian conditioning phase, and a testing phase. In the instrumental training phase, participants acquired the associations between pressing two keys on the keyboard (M and N) and two respective food rewards (i.e., instrumental conditioning). Then, in the Pavlovian conditioning phase, they were presented with five neutral graphical pattern cues pairing with the two food rewards used in instrumental conditioning, two other food rewards not previously presented, and a "no food reward" control respectively. In the PIT testing phase, they were told to press either M or N as many times as they can to get the food they wanted, in the presence and in the absence of the five Pavlovian cues. Participants completed the PIT training phases between 20:00 and 22:00 prior to sleep manipulation and the PIT testing phase between 0800 and 10:00 in the following day for both TSD and NSD conditions to control for circadian influences.
Results: Repeated-measure ANOVA showed that there was a main effect of satiation, indicating that instrumental responses decreased after satiation. Significant specific transfer effects were observed regardless of sleep conditions or satiation but not for the general transfer effect, indicating that the presence of cues associated with the key increased instrumental responses on that key. However, there was not a main effect of sleep on the specific transfer effects nor general transfer effects.
Conclusions: This finding did not support the hypothesis. Sleep deprivation did not alter the effect of Pavlovian cues on instrumental responses for highly palatable food rewards. It is possible that one-night TSD might not be sufficient to induce changes in habitual control of behavior. Future research directions will be discussed.
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PERSONALIZED EEG/FNIRS: A PROMISING TOOL TO STUDY WHOLE-NIGHT SLEEP IN HEALTHY AND PATHOLOGICAL CONDITIONS

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Introduction: Sleep is a crucial period during which neuronal and hemodynamic activities interact to support healthy brain functions. Simultaneous Electro-Encephalography and functional Magnetic Resonance Imaging (EEG-fMRI) remain the reference to study the hemodynamic responses associated with neuronal activity (Dang-Vu et al., 2010; Gotman et al., 2011). However, fMRI, only sensitive to fluctuations in deoxygenated hemoglobin, is limited by the difficulty to perform long-duration recordings. To overcome this issue, functional Near-Infrared Spectroscopy (fNIRS), a wearable technique sensitive to both cortical hemodynamic fluctuations of oxyhemoglobin (HbO) and deoxyhemoglobin (HbR), has been considered as an emerging technique for sleep monitoring (Ren et al.,2020). However, most fNIRS sleep studies relied only on a few optical sensors on the forehead, therefore not allowing accurate localization of the sleep-specific hemodynamic fluctuations. Although, it is well known that there are strong interactions between sleep and epilepsy with an increase of epileptic activity during non-rapid eye movement sleep (Frauscher et al., 2019, Lambert et al., 2018), the influence of sleep stage on the hemodynamic response to epileptic discharges remain unknown. In this preliminary work, we are proposing personalized EEG/fNIRS whole night monitoring as a promising tool to study sleep, where personalized fNIRS maximizes signal sensitivity to targeted cortical regions and allows an accurate localization of the hemodynamic responses (Cai et al., 2021).
Materials and Method: We performed whole-night personalized EEG-fNIRS monitoring on 4 healthy (20-35 years old) subjects and 3 focal epilepsy patients (21-42 years old). EEG electrodes were glued in the 10-20 layout using clinical adhesive (collodion) along with EOGs, EMG, and ECG. For the healthy subjects, we installed 54 fNIRS channels covering bilateral auditory cortices. For the epileptic patients, we installed 52 fNIRS channels targeting the epileptogenic focus and its homologous contralateral region (Pellegrino et al., 2016, Machado et al., 2018). The focus was estimated using EEG and Magnetoencephalography source localization of epileptic discharges. Using EEG, sleep stages and epileptiform discharges (bursts of spikes, spike, and waves and seizures) were marked and scored by sleep and epilepsy experts. We used a multi-taper approach to estimate HbO/HbR oscillatory characteristics during each sleep stage (Scheeringa et al., 2011).
Results: Average total bedtime was 7hours 11minutes (SD: 55minutes). Sleep efficiency was above 90% for all healthy subjects and was ranging from 70 to 80% in epilepsy patients. We found a gradual decrease of HbO oscillations power from awake to N3 followed by an increase in REM within endothelial (0.005-0.02Hz), neurogenic (0.02- 0.04Hz), and myogenic (0.04-0.15Hz) frequency bands in both healthy and epileptic subjects, in agreement with the existing literature (Näsi *et al.*,2011). In the epilepsy patients, we observed an HbO decrease and a HbR increase at the time of interictal epileptiform discharges (IEDs) and seizures. In one patient, fNIRS response to the IEDs differed between N2 and N3, suggesting a