to investigate whether the apnoea-hypopnoea index (AHI), arousal index (AI) and mean oxyhemoglobin saturation in sleep (mean SpO_2) - conventional polysomnography (PSG) measures of respiratory disturbance, sleep fragmentation and nocturnal hypoxaemia respectively - were associated with worse cognitive performance in OSA subjects.
Methods: In this cross-sectional analysis, 75 subjects with PSG-confirmed OSA (age: 66.1yrs ± 7.1yrs, male: 51%) were recruited from a hospital sleep clinic and had their cognitive profile screened via the Addenbrooke's Cognitive Examination – Revised (ACE-R). Linear regression was used to determine whether AHI, AI and mean SpO_2 were associated with total ACE-R scores. Binary logistic regressions were then performed to determine whether increased severity of OSA (AHI ≥ 30 events/hour), sleep fragmentation (AI ≥ 30 events/hour), and hypoxaemia (mean SpO_2 ≤ 92%) increased the likelihood that participants would have worse cognition (ACE-R score ≤ 88).
Results: There was a modest positive association with mean SpO_2 and ACE-R score (r^2 = 10.4%, $p < 0.01$). Similarly, logistic regression found only increased hypoxaemia (mean SpO_2 ≤ 92%) to be associated with increased odds of worsened cognition (OR 3.00, 95% CI (1.090–8.254), $p < 0.05$).
Discussion: OSA-induced hypoxaemia, and not sleep fragmentation or respiratory disturbance, was found to be most strongly associated with deficits in cognitive performance.

O039

DIFFERENTIAL EFFECTS OF SLEEP DEPRIVATION AND SLEEP RESTRICTION ON ERROR AWARENESS

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Introduction: The ability to detect and subsequently correct errors is important in preventing the detrimental consequences of sleep loss. We report the first study to compare the effects of total sleep deprivation (TSD) and sleep restriction (SR) on error awareness.
Methods: Thirteen healthy adults (11F, age=26.8±3.4y) underwent a 34h TSD protocol, completing the Error Awareness Task (EAT: a combined Stroop/1-back/GoNogo task) at 4h and 27h post-wake. Twenty healthy adults (11F, age=27.4±5.3y) were studied both well-rested (WR: 9h sleep) and following SR (3 nights of 3h sleep), completing the EAT once/day (8-9h post-habitual wake). The EAT required participants to withhold responding to "nogo" stimuli and signal, via a button press, whenever they realised they made an error on these nogo trials.
Results: TSD did not significantly affect error rate (p=.712) or error awareness rate (p=.517), however, participants were slower to recognise errors after TSD (p=.004). In contrast, SR increased error rate (p<.001), decreased error awareness (p<.001), and slowed recognition of errors (p<.01).
Discussion: Three nights SR impaired the ability to recognise errors in real-time, despite a greater number of errors being made. Thus, impaired error awareness may be one mechanism underlying increased sleep loss-related accidents and errors in occupational settings, as well as at home. Interestingly, 1-night TSD did not lead to more, or impaired recognition of errors. TSD participants were slower to recognise errors, which may be problematic in safety critical settings. Technological and/or operational solutions may be needed to reduce the risk of errors going unrecognised.

O040

SLEEP RESTRICTION IMPAIRS THE ABILITY TO INTEGRATE MULTIPLE PIECES OF INFORMATION INTO A DECISION

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Introduction: Sleep deprivation impacts overall decision-making, though the impact on specific components of decision-making are less well studied, especially outside of total sleep deprivation. Here, we examine the effects of sleep restriction on the ability to integrate multiple pieces of information into a decision.
Methods: Healthy adults (n=41; age=27.9±6.0 years, 20F) lived in the sleep lab for 2 counterbalanced conditions: well-rested (WR: 9-hour sleep opportunity for 4 nights) and sleep restriction (SR: one 9-hour night, followed by three 3-hour nights). Following the last night of each condition, participants performed the decision task. Across 48 trials, participants first saw two containers, with different numbers of black and white balls. Eight balls were randomly drawn, with replacement, from one unknown container. Participants decided which container was used, based on the "odds" each container was used and draw results ("evidence"). Mathematical modelling determined the amount of weight given to odds/evidence. The "best" decisions integrate both pieces of information.
Results: When WR, participants utilised both pieces of information to make their decisions, though odds were given slightly more weight. During SR, the amount of weight given to the odds did not change, and the weight given to the evidence decreased significantly.
Conclusion: SR impaired the ability to integrate multiple pieces of information into a decision. Instead, participants focused on a single piece of easy-to-understand information and did not fully utilise a harder-to-understand piece of information. This has implications for complex applied environments where individuals have large amounts of information with which to make decisions.

O041

THE IMPACT OF INCLUDING OXYGEN DESATURATIONS OCCURRING DURING AWAKE EPOCHS ON THE OXYGEN DESATURATION INDEX

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Introduction: The oxygen desaturation index (ODI) is an important measure of sleep disordered breathing during polysomnography (PSG) however there is no accepted standard for its calculation. The AASM Manual for the Scoring of Sleep and Associated events (V2.6) does not specify whether oxygen desaturations occurring during awake epochs should be included. More generally, epoch-based scoring is potentially problematic for accurate ODI calculation. This study aims to compare the calculation of ODI including and excluding oxygen desaturations occurring during awake epochs and to determine the impact of sleep efficiency (SE) on any discrepancy.
Methods: Using twenty-one consecutive unattended PSG's for investigation of OSA, two oxygen desaturation indices were calculated from each PSG; one excluding (ODIsleep) and one including (ODIall) oxygen desaturations marked in awake epochs.