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SALIVARY A-AMYLASE RESPONSE TO REPEATED EXPOSURE TO ACUTE STRESSORS IS ALTERED BY SLEEP DEPRIVATION

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Introduction: Salivary α-amylase (sAA), a biomarker of autonomic nervous system (ANS) activity, is believed to reflect physiological responsiveness to stressors. Although exposure to stressors often co-occurs with sleep deprivation, little is known about their combined effects. We investigated the sAA response following repeated exposure to acute stressors at well-rested baseline and during total sleep deprivation (TSD).
Methods: As part of a larger study, N=8 healthy subjects (ages 29.0±6.6; 4 females) participated in a 4-day/3-night laboratory-based experiment. Subjects had 38h TSD preceded and followed by 10h sleep opportunities (22:00–08:00). On days 2 (baseline) and 3 (TSD), subjects completed two (A, B) deadly-force decision-making simulations in a high-fidelity shooting simulator with 30min rest between sessions. During each simulation, subjects (who were civilians) acted as police officers while viewing interactive videos depicting stressful law enforcement emergency response scenarios involving deadly-force decision-making. In these scenarios, subjects attempted to de-escalate the situations in the scenarios using verbal commands. If unsuccessful, they were to determine if the use of (simulated) deadly force was necessary and respond accordingly. Saliva samples were collected immediately before the first simulation of the baseline and TSD days, and immediately, 15min, and 30min after each simulation. Samples were assayed in duplicate using a sAA kinetic enzyme assay; results were normalized against the first pre-stressor sample of the baseline day.
Results: Post-simulation sAA values normalized to reference were analyzed with mixed-effects ANOVA with fixed effects of day and sample and their interaction and a random effect over subjects on the intercept. There was a significant effect of sample ($F[5,76]=3.38$, $p=0.008$) indicating that sAA spiked immediately after each deadly-force decision-making simulation. Planned comparisons revealed significantly blunted sAA during TSD compared to baseline immediately after the second simulation of the day ($t[76]=2.09$, $p=0.040$).
Conclusion: In our sample of civilian subjects, the deadly-force decision-making simulations elicited a sAA response, which was blunted after the second simulation on the day subjects were sleep-deprived, suggesting that TSD mediates the biological response to repeated exposure to acute stressors. Whether this result generalizes to police officers and military personnel trained in deadly-force decision-making remains to be determined.
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A SYSTEMATIC REVIEW OF SLEEP HEALTH AND OUTPATIENT OPIOID USE DISORDER TREATMENT IN ADULTS

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Introduction: Opioid Use Disorder (OUD) affects 2 million people in the United States and poor sleep health (satisfaction, alertness, timing, efficiency, and duration) is a primary driver of medication-assisted treatment (MAT) failure and relapse. It is known that people in therapy for OUD have a high prevalence of sleep problems (>75%) and poorer sleep health compared to people without OUD (e.g., lower sleep efficiency, shorter duration, and more awakenings). However, sleep health is not routinely assessed. Thus, in this systematic review, we examined original studies on sleep health within the context of adults receiving outpatient MAT for OUD.
Methods: We conducted a systematic review of original research on sleep health in adults receiving outpatient treatment for OUD. Multiple electronic databases (PubMed, PsycINFO, and CINAHL) were searched for relevant studies published in English from the establishment of each database to September 14, 2021. Quality was assessed with the Mixed Methods Appraisal Tool (v. 2001).
Results: Sixty two studies were selected including 17,913 adults with OUD and 604 comparison participants without OUD (mean age = 37.4 ± 6.6 years; 54.1% male). Sixty-one studies were quantitative (50 cross sectional, 6 longitunal, 5 interventional) and 1 was mixed methods. Participants with OUD had poorer satisfaction (Pittsburgh Sleep Quality Index mean 7.4 ± 2.2 v. 4.7 ± 2.3), shorter polysomnography (PSG) measured total sleep time (336.6 ± 41.4 mins (5.6 h) v. 411.8 ± 33.3 mins (6.8 h), spent less time in PSG measured slow wave N3 sleep (7.2 ± 5.8% v. 13.4 ± 6.4%), and had a lower percentage of PSG measured rapid eye movement sleep (14.6 ± 4.6% v. 21.7 ± 4.0%) than comparison participants without OUD.
Conclusion: Studies were predominantly observational ranging from a period of 1-2 nights to 2 years with participants at various points in treatment. More work is needed to understand the multidimensional depth of sleep health in adults with OUD. Optimizing sleep health in adults with OUD may improve their addiction trajectory and should be a priority in practice and research.
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THE FIRST NIGHT EFFECT IN ADOLESCENTS WITH AND WITHOUT INSOMNIA

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Introduction: Insomnia in adolescence is a common and debilitating condition, and vulnerability to stress is known to play a major role its development. In this study, we investigated the effects of sleeping under stress in a sample of adolescents with and without clinically significant insomnia symptoms. The first night in the laboratory was used as an established experimental paradigm for eliciting stress through exposure to an unfamiliar environment.
Methods: Forty-one postpubertal adolescents (18.4 ± 0.7 years) with (n=14, 9 girls) and without (n=27, 16 girls) DSM-5 insomnia symptoms completed two non-consecutive polysomnographic (PSG) nights in the laboratory. Repeated-measures ANOVAs were used to analyze differences in PSG sleep measures between the first and subsequent night, with group (insomnia vs. control) and sex as between-subject factors.
Results: Both groups showed a robust stress effect on the first night, characterized by lower sleep efficiency (↓2.2%)