0234

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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0235

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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0236

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%)

and total sleep time (↓6.4%), and more awakenings (↑12.4%) compared with the subsequent night ($p<0.05$). Both groups also had less non-rapid-eye-movement (NREM) (↓4.9%) and REM (↓18.8%) sleep on the first night. Girls with insomnia had lower amounts of REM sleep than boys with insomnia on both nights ($p<0.05$). Both groups perceived higher levels of pre-sleep somatic (↑10.3%) and total (↑7.2%) arousal on the first night compared to the subsequent night ($p<0.05$). For cognitive arousal, there was a night-group-sex interaction effect: while controls showed no changes between the two nights, boys with insomnia reported significantly lower pre-sleep cognitive arousal levels on the subsequent laboratory night compared to the first night (↓32.9%), whereas cognitive arousal levels remained elevated on the subsequent night in girls with insomnia ($p<0.05$).

Conclusion: Sleeping for the first time in the laboratory leads to greater pre-sleep arousal and disrupts sleep in adolescents with and without insomnia symptoms. Longitudinal studies are needed to examine the female vulnerability in the manifestation of stress-related hyperarousal, particularly in the context of insomnia development during adolescence.

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0237

SLEEP REACTIVITY PROSPECTIVELY PREDICTS DISTRESS REACTIONS TO THE COVID-19 PANDEMIC 3-4 YEARS LATER

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Introduction: The 2019 coronavirus disease (COVID-19) pandemic is a protracted stressor with far-reaching effects on daily life. Although most individuals exhibit resilience in the wake of adversity, it is not clear which characteristics reliably predict resilience versus longstanding distress. It is vital to delineate predictors of pandemic-related distress to highlight modifiable risk factors that can be targeted to enhance psychological resilience. Sleep reactivity may be an important predictor of pandemic reactions because it reflects a vulnerability to experience pronounced sleep disturbances in response to stress, which serve as barriers to healthy adjustment to adversity. Therefore, this study tested sleep reactivity as a prospective predictor of pandemic-related distress.

Methods: Participants were recruited from a previous randomized controlled trial (RCT) comparing self-guided digital CBT-I against a sleep education control in treating insomnia and preventing depression. Participants in the RCT were enrolled between 2016-2017 and were eligible for this follow-up study conducted between April and May 2020 (N = 208; dCBT-I: n = 102; control: n = 106). Pre-treatment sleep reactivity was measured in 2016-2017 (T1) using the Ford Insomnia Response to Stress Test (FIRST). COVID-19 distress was measured in April 2020 (T2) using the Impact of Events Scale (IES) and Quick Inventory of Depressive Symptomatology (QIDS). All analyses controlled for treatment condition and COVID-19 impact.

Results: T1 FIRST predicted T2 IES ($b = 0.29$, + 0.14 SE, $p < .05$) and QIDS ($b = 0.16$, + 0.04 SE, $p < .001$), such that higher sleep reactivity pre-pandemic predicted more severe stress responses and depressive symptoms during the pandemic 3-4 years later. Exploratory analyses revealed T1 FIRST was a predictor of the IES subscales arousal and intrusions ($bs = 0.02$, + 0.01 SEs, $ps < .05$), but not avoidance.

Conclusion: These findings build on evidence that sleep reactivity prospectively predicts reactions to trauma and demonstrate its predictive utility generalizes to pandemic responses. Sleep reactivity is a modifiable risk factor that may be targeted using cognitive-behavioral or mindfulness-based approaches, and thus may offer a new pathway to resilience.

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0238

PERCEIVED CHILDHOOD NEIGHBORHOOD SAFETY AND SLEEP HEALTH DURING ADULTHOOD

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Introduction: Neighborhood safety has been cross-sectionally associated with sleep health at different life stages. However, few studies have investigated childhood neighborhood safety and adulthood sleep despite the possibility that childhood neighborhood safety may serve as a modifiable target for primordial prevention of poor sleep health.

Methods: Using data from 1,611 Black/African-American women enrolled in the Study of Environment, Lifestyle and Fibroids, we investigated associations between perceived childhood neighborhood safety and adulthood sleep. Participants reported safety of their childhood neighborhoods as unsafe vs. safe at ages 5,10, and 15 years. Participants also self-reported current (ages 23-35 years) sleep duration and quality (i.e., frequently wake feeling unrested [≥4 days/week] and frequent insomnia symptoms [≥15 days/month of difficulty falling or staying asleep]). Adjusting for childhood socioeconomic characteristics, log binomial models estimated prevalence ratios (PRs) and 95% confidence intervals (CIs). For perceived safety at ages 10 and 15 years, we applied inverse probability weights to models to adjust for perceived neighborhood safety at prior ages.

Results: Mean age ± standard deviation was 29 ± 3.5 years. Prevalence of residence in a childhood neighborhood perceived as unsafe increased with age (Age 5- 20%, Age 10- 22%, Age 15- 31%), and 17% reported an unsafe neighborhood at every age. Both short sleep duration (<7 hours) and frequently waking feeling unrested during adulthood were reported by approximately 60% of women, and 10% reported frequent insomnia symptoms. Participants in perceived unsafe vs. safe neighborhoods at every age were more likely to frequently wake feeling unrested as adults (PR=1.12 [95% CI: 1.00-1.25]). Perceived unsafe neighborhood at ages 5 and 15 years was associated with frequent insomnia symptoms and frequently waking feeling unrested, respectively. Perceived unsafe neighborhood at age 10 years was marginally associated with a higher prevalence of both frequently waking feeling unrested (PR=1.11 [0.98-1.27]) and frequent insomnia symptoms (PR=1.58 [0.99-2.52]) during adulthood.