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CHILD MALTREATMENT AND MULTIDIMENSIONAL SLEEP HEALTH AMONG INCOMING FIRST-YEAR COLLEGE STUDENTS

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Introduction: Despite the growing body of evidence linking child maltreatment to compromised sleep health in adulthood, links in emerging adults are understudied. We examined associations between child maltreatment (CM) and multidimensional sleep health among emerging adults undergoing the major life transition of starting college.

Methods: First-year college students (N=682, 41% male, 48% Non-Hispanic White, 22% Non-Hispanic Asian, 15% Hispanic all races, 6% Non-Hispanic Black, and 9% Non-Hispanic other races) completed daily sleep diaries (DSDs) for 9 weeks, and completed the Childhood Trauma Questionnaire (CTQ), Epworth Sleepiness Scale (ESS), and Pittsburgh Sleep Quality Index (PSQI) following DSD completion. We used linear regression models to examine associations between CTQ-derived CM (0=none, 1=any [moderate to severe emotional abuse/neglect, physical abuse/neglect, or sexual abuse]) and sleep health (Buysse, 2014) using a multidimensional score encompassing components from the RUSATED model (regularity [DSD sleep midpoint SD: 0= >1 hour, 1= ≤1 hour], satisfaction [PSQI sleep quality item: 0=fairly or very bad, 1=very or fairly good], alertness [ESS score: 0= >10, 1= ≤10], timing [DSD sleep midpoint: 0= <3:30 or >5:30, 1= ≥3:30 and ≤5:30], efficiency [DSD sleep efficiency: 0= <93%, 1= ≥93%], and duration [DSD sleep duration: 0= <7 hours or >10 hours, 1= ≥7 hours and ≤10 hours].

Results: In the full sample 20.5% reported CM (within-group prevalences: females 21%, males 20%, Non-Hispanic Whites 12%, Non-Hispanic Asians 28%, Hispanics of all races 26%, Non-Hispanic Blacks 34%, and Non-Hispanics of other races 30%). Those with CM had significantly worse sleep health (B=-0.25, 95% CI=-0.46, -0.04) compared to those without CM, but not after adjustment for sex and race/ethnicity. In logistic regression models, the only individual sleep health component significantly associated with CM was sleep satisfaction. After adjustment for sex, race/ethnicity, and depressive symptoms, those who experienced CM had a 52% lower odds of reporting good sleep quality (OR=0.48, 95% CI=0.30, 0.76).

Conclusion: CM is associated with worse sleep satisfaction among first-year college students, which aligns with previous research in older adults. Additional research should examine neurophysiological correlates of sleep satisfaction in the context of child maltreatment and effects on subsequent health.

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TESTING THE DIRECTIONALITY OF SLEEP AND STRESS DURING THE PERINATAL PERIOD: WHAT'S THE IMPACT ON PERINATAL DEPRESSION?

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Introduction: Pregnancy is a time of pronounced sleep disturbance, with a majority (~85%) of women endorsing shorter, more fragmented sleep as gestation progresses. While new-onset antenatal depression (AND) is a known risk factor for postpartum depression, its etiology remains less understood, despite well-established evidence that incidence is the same among healthy first-time mothers as compared to women with established riskfactors inclusive of family or personal history of psychopathology. Heightened daily stress appraisals may be one critical pathway through which disrupted sleep gives rise to AND. The current study tested the directionality of the relationship between habitual nighttime sleep parameters and daytime stress ratings using a prospective amulatory field study design.

Methods: Fifty primiparous women (38% White; 32% Black; 30% Other race/ethnicity; mean age = 32 years, 28 weeks gestation) without a history of sleep disorders nor psychopathology completed 10-days (9-nights) of actigraphy and sleep diaries. They also engaged in 3-days of superimposed ecological momentary assessments (EMA) rating stress, positive, and negative affect at four intervals throughout the day. Analyses examined negative affective responses to social conflict and task-based demand througout days of EMA, at the within-person and between-women levels. Sleep variables explored included total sleep time (TST), sleep efficiency (SE; log-transformed), sleep onset latency (SOL) and sleep quality as measured by the Pittsburgh Sleep Quality Index. Cross-lagged hierarchical mixed models tested directionality of sleep-stress relationship. Time-varying covariates included time-of-day, previous day stress for sleep outcomes, and previous night sleep for stress outcomes, at the within-person levels.

Results: After days of greater stress (demand and conflict), women experienced significantly shorter, less efficient sleep and took longer to fall asleep (by both diary and actigraphy; [Beta(SE)=-6.3(1.4); 1.2(.12,), R^2=.27, .32, respectively; ps<.01]. Following nights of shorter sleep, women endorsed greater negative affective responses to stress (Beta=.12, SE=.01, p<.001; R^2=.27). Over the assessment period, women who had shorter, less efficient sleep experienced greater frequency, higher severity stressors, after adjusting for time-of-day, and baseline sleep characteristics, depression and anxiety levels (Betas = -7.4(2.6); .14(.01), ps<.001, respectively). Given this bidirectional support, stress was examined as a moderator of the relationship between TST and depression severity at 34-36 weeks gestation, indicating that greater stress explained the relationship between shorter TST and heightened AND after adjustment for baseline measures.

Conclusion: This is the first study to explore directionality of sleep-stress relationships in a perinatal sample; results provide support for the idea that heightened daily stress engenders greater sleep disturbance (difficulty initiating and maintaining sleep; shorter duration). Bidirectional support for shorter sleep duration and increased stress appraisal was also found. The current project provides preliminary evidence for stress "spill-over" effects (i.e., stress transmission) as a potential mechanism for heightened antenatal depression symptoms.

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SYSTEMIC DETERMINANTS AND CONSEQUENCES OF SLEEP DISTURBANCE IN FAMILY MEMBERS OF THE CRITICALLY ILL

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Introduction: Family members of intensive care unit (ICU) patients are at increased risk of experiencing sleep disturbances, which in turn can exacerbate symptoms of anxiety and depression. However, little is known about how sociocultural determinants influence their predisposition to sleep disturbances, and how such sleep disturbances contribute to symptoms of anxiety and depression across the trajectory of the patient's ICU stay. Therefore, we sought to: 1) identify individual and interpersonal sociocultural predictors of sleep disturbance symptoms, and 2) describe the influence of select sociocultural determinants and sleep disturbances on subsequent symptoms of anxiety and depression.
Methods: Using a repeated-measures, correlational design, we recruited family members of incapacitated, mechanically ventilated patients within four adult intensive care units at a tertiary medical center in northeast Ohio. We collected baseline data (T1) after obtaining informed consent and seven (T2) days post-baseline. We measured individual and interpersonal sociocultural determinants, as well as symptoms of sleep disturbance, anxiety, and depression with self-report instruments. To test our aims, we used step-wise linear regression.
Results: For aim 1 (N = 30), participants who were female, non-white, married, and had prior healthcare decision-making experience reported more severe sleep disturbance symptoms ($R2 = .69$, $F(11,18) = 3.59$, $p = .008$). For aim 2 (n = 20), the aforementioned determinants and T1 sleep disturbance scores significantly predicted T2 anxiety ($R2 = .62$, $F(5,14) = 4.61$, $p = .01$) and depression ($R2 = .65$, $F(5,14) = 5.24$, $p = .006$) severity. None of the predictors were statistically significant for the full anxiety model; notably, the effects of gender and prior healthcare decision-making experience were statistically significant until T1 sleep disturbance was inserted in the model. T1 sleep disturbance scores were the only statistically significant predictor in the full depression model.
Conclusion: We provide preliminary evidence that sleep disturbances among family members of ICU patient may contribute to the severity of depressive symptoms in family members of ICU patients. We encourage future researchers to replicate and expand upon these findings to understand the development of sleep disparities in this vulnerable population.
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CHRONOTYPE AND AFFECTIVE RESPONSE TO SLEEP RESTRICTION, SLEEP DEPRIVATION, AND CIRCADIAN MISALIGNMENT

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Introduction: Late chronotypes have been shown to have decreased positive affect during the day and during sleep loss. Findings for negative affect are inconsistent. The present analysis examined the effect of chronotype on positive and negative affect during two sleep and circadian challenges.
Methods: In both studies, chronotype was determined by habitual mid-sleep time. In Study 1, 10 healthy adults (5 early, 5 late chronotypes) completed a 10-day protocol of sleep restriction followed by total sleep deprivation. Participants maintained habitual 8h sleep schedules at home for 1 week, then completed a 2-day in-laboratory protocol: 4h of sleep restriction, followed by a 4h sleep opportunity, followed by 28h of sleep deprivation. Affect was assessed with the Positive and Negative Affect Schedule (PANAS) every hour during scheduled wakefulness. In Study 2, 14 healthy adults (7 early, 7 late chronotypes) completed a 39-day protocol of combined sleep restriction and circadian misalignment. Participants maintained habitual 8h sleep schedules at home for 2 weeks, then completed a 4-day in-laboratory protocol with the following sleep opportunities: 8h on night 1, 3h on night 2, and 3h on mornings 3 and 4. After 3 days of at-home unscheduled recovery sleep opportunities, the protocol was repeated. Affect was assessed with the PANAS every 3h during scheduled wakefulness. Data from each study were analyzed separately with mixed-model ANOVA.
Results: Positive affect decreased during sleep restriction+sleep deprivation and sleep restriction+circadian misalignment ($p<.05$), regardless of chronotype. However, late chronotypes reported lower positive affect than early chronotypes across both sleep/circadian challenges ($p<.05$), and this effect was accounted for by baseline positive affect. Negative affect was not consistently impacted by sleep/circadian challenges or chronotype, with or without considering baseline negative affect. In both studies, chronotype did not interact with sleep/circadian challenges.
Conclusion: These findings are consistent with prior work showing later chronotypes have lower positive affect. Chronotype and sleep loss/circadian misalignment may impact affect through independent mechanisms. Future work is needed to replicate these findings in larger samples with more extreme chronotypes.
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