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## Examining the Influence of Parenting Practices on Youth's Sleep Health During a Sensitive Developmental Period

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

EXAMINING THE INFLUENCE OF PARENTING PRACTICES ON YOUTH'S  
SLEEP HEALTH DURING A SENSITIVE DEVELOPMENTAL PERIOD

A dissertation submitted in partial fulfillment of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Juliana Acosta Liévano

2022

To: Dean Michael R. Heithaus  
College of Arts, Sciences, and Education

This dissertation, written by Juliana Acosta Liévano, and entitled Examining the Influence of Parenting Practices on Youth's Sleep Health During a Sensitive Developmental Period, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Date of Defense: May 31, 2022

The dissertation of Juliana Acosta Liévano is approved.

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Dean Michael R. Heithaus  
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Andrés G. Gil  
Vice President for Research and Economic Development  
and Dean of the University Graduate School

Florida International University, 2022

## DEDICATION

To my sweet husband, mi mamá, mi papá, mis hermanos, mis sobrinos, y mis futuros hijos. Todo esto es gracias a ustedes y para ustedes.

## ACKNOWLEDGMENTS

Thank you to my unconditionally supportive mentors, Justin, Dana, and Nely. I am grateful beyond words that you were put on my path.

ABSTRACT OF THE DISSERTATION

EXAMINING THE INFLUENCE OF PARENTING PRACTICES ON YOUTH'S  
SLEEP HEALTH DURING A SENSITIVE DEVELOPMENTAL PERIOD

by

Juliana Acosta Liévano

Florida International University, 2022

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Sleep problems among youth are highly prevalent and associated with mental and physical health concerns. During early adolescence, youth's sleep health is at risk for disturbance, and problems with sleep around this developmental period have been shown to longitudinally predict escalating rates of anxiety and depression later in adolescence. Sleep-related behaviors are embedded within the family system and as such they are influenced by familial processes including parenting practices. However, the influence of parenting practice on young adolescents' sleep health has been understudied. Moreover, there is limited evidence on the concept of nighttime parenting as it relates to youth's sleep health. Lastly, although parenting practices have been identified as contributors to youth's sleep health, parents' active involvement within sleep interventions has been limited.

This dissertation is comprised of three manuscripts focused on the association between nighttime and general/daytime parenting practices and youth's sleep health.

First, I provide evidence on distinct constellations of parenting practices that are differentially predictive of youth sleep problems, with findings on positive parenting practices longitudinally predicting better sleep health indices and negative parenting practices longitudinally predicting poorer sleep health indices. Then, I expand on this research by developing a measure that assesses parenting practices that occur within the nighttime hours, and thereby, provide a new framework for the impact of nighttime parenting practices on youth's sleep health during early adolescence. Findings from the second study corroborate those from the first study as positive and negative nighttime parenting practices differentially related to youth's sleep health above and beyond the impact of general/daytime parenting practices. Lastly, informed by the aforementioned studies, I conducted a clinical open trial of a family-based intervention for early adolescents with sleep problems, which intentionally targeted nighttime parenting practices. Findings revealed pre- to post-treatment improvements in youth sleep and mental health as well as favorable trends in parenting practices. This collection of work contributes to the conceptualization of the socioecological model of youth's sleep health and highlights parenting practices as potential treatment targets that may be promising in addressing the pervasiveness and gravity of poor sleep health during the sensitive developmental stage of early adolescence.

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## CHAPTER I

### Longitudinal associations between parenting practices and youth sleep problems

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## Abstract

Sleep problems among youth are highly prevalent and associated with adjustment difficulties. When considering influences on youth's sleep, bidirectional links between youth's sleep health and family functioning have been suggested. Parenting practices are among the many familial factors that could be transactionally related to poor sleep in youth; however, research is lacking on potential longitudinal associations between parenting practices and sleep problems in youth. Additionally, sensitive periods for this link are mostly unknown. The current study examined longitudinal relations between constellations of parenting practices and youth sleep health to identify profiles of parenting practices that are predictive of sleep problems in youth across different developmental stages. Participants were 292 parents ( $M = 36.51$ ,  $SD = 7.3$ ) of children between the ages of 3 and 14 ( $M = 8.4$ ,  $SD = 3.6$ ). A person-centered approach was employed to create profiles across traditionally-labeled positive and negative parenting practices, as well as supportive and unsupportive parental emotion socialization strategies. Parenting profiles were then examined as longitudinal predictors of youth sleep problems. Findings revealed three distinct parenting profiles, which were differentially associated with sleep problems in youth, with the first profile predicting the lowest levels of sleep problems and the third profile predicting the highest levels of sleep problems, particularly among peripubertal youth. This study extends previous findings by elucidating distinct constellations of parenting practices that are differentially predictive of youth sleep problems and highlighting parenting among the various family processes that can longitudinally contribute to youth's sleep health.

## **Introduction**

Sleep problems among youth are highly prevalent and associated with difficulties across several developmental domains (e.g., emotional, behavioral, cognitive, and physical health; Kelly & El-Sheikh, 2014; Dahl & El-Sheikh, 2007). Indeed, sleep problems (e.g., insufficient sleep, poor quality sleep) are pervasive in mental health disorders and among the most prominent clinical symptoms of several mood and anxiety disorders (Sadeh & Raviv, 2000). Further, sleep health, characterized by dimensions of duration, regularity, satisfaction, alertness, timing, and efficiency (Buysse, 2014), is a pivotal predictor of socioemotional adjustment (El-Sheikh & Kelly, 2017), and evidence supports that dimensions in sleep health that are problematic may precede internalizing pathology in childhood and adolescence (McMakin & Alfano, 2015). Specifically, poor sleep in youth has been demonstrated to prospectively predict depression (Roberts & Duong, 2014), suicide, risk taking behavior (Wong, Brower, & Zucker, 2011), and low academic achievement (Shochat, Cohen-Zion, & Tzischinsky, 2014) among other negative outcomes. Consequently, sleep problems in youth are recognized as a serious health risk and public health concern that necessitates urgent attention (American Academy of Sleep Medicine, 2010).

### **Youth's Sleep Within the Context of Family Functioning and Parenting**

Attempts at elucidating contributors to poor sleep health in youth have identified family functioning as intrinsically interconnected with youth's sleep behaviors (El-Sheikh & Kelly, 2017). For example, research has demonstrated higher youth sleep problems in families with high levels of conflict and parenting stress. Conversely, youth who live in supportive family environments sleep better and longer (El-Sheikh & Kelly,

2017). Research on the influence of family functioning on youth's sleep has predominantly considered parenting behaviors and the parent-youth relationship (Meijer & Dekovic, 2016). For instance, parental monitoring of sleep-wake activities (e.g., bedtime routine) has been linked to longer sleep duration in youth (Gunn et al., 2019). Conversely, parent-child interactions that lack consistent limit setting, especially during bedtime routines, have been associated with youth bedtime resistance, difficulty initiating sleep, and nightmares (Meltzer & Mindell, 2007). Importantly, parenting practices are among the various family processes that transactionally influence one another to impact youth's sleep. Consequently, it is important to emphasize the reciprocal nature of the relationship between children's sleep and parenting practices given the possibility that youth's individual characteristics could similarly influence parents' behavior. Correspondingly, youth sleep problems have been demonstrated to predict increased maternal negativity and decreased maternal sensitivity and closeness, highlighting the bidirectional association between youth sleep problems and parenting practices (Bell & Belsky, 2008).

Although research has linked general parenting behaviors, including behavioral control (i.e., structured nighttime routine), to youth sleep health, there has been scant attention to how emotion-related parenting practices may be related to sleep (Eisenberg, Spinrad, & Eggum, 2010). Emotion socialization (ES) behaviors encompass the myriad ways parents teach their children about emotion identification, expression, and modulation (Eisenberg et al., 2010). A large body of research has focused specifically on parental reactions to youth emotion. For example, parental nonsupportive reactions (i.e., dismissive, critical, punitive) to youth negative emotions (i.e., distress, sadness, anger)

have been associated with less skillful emotion regulation, emotional overarousal, and heightened distress in youth (Eisenberg et al., 2010; Thompson & Meyer, 2007), which could potentially manifest in sleep problems. Alternatively, emotion-related aspects of parenting, such as emotional responsiveness, warmth, and supportiveness have been shown to predict youths' development of skillful regulation of emotions (Thompson & Meyer, 2007) which, in turn, could protect against sleep problems.

Theoretically, and consistent with transactional and ecological models, parenting environments perceived as conflicted, unstable, and stressful result in vigilant states in youth that directly oppose sleep processes and can therefore disrupt sleep (El-Sheikh & Kelly, 2017). More specifically, negative parenting practices can undermine youth's ability to manage negative emotions and thereby affect their psychological wellbeing through greater emotional dysregulation and poor emotion-related coping (Sanders et al., 2015), which may in turn lead to vigilant states known to disrupt sleep (Dahl, 1996). Accordingly, harsh parenting (e.g., psychological control, hostility) has been previously linked to youth sleep problems (Kelly, Marks, & El-Sheikh, 2014). Additionally, mother-child relationships characterized by greater conflict and less closeness have been associated with greater sleep problems in children (Bell & Belsky, 2008). Conversely, positive parenting practices (e.g., warmth, closeness, clear limit setting, monitoring) have been linked to more optimal sleep in children (Bell & Belsky, 2008).

Collectively, research findings support a contribution of parenting to youth sleep health and highlight the need to target parenting practices to improve youth sleep problems and associated emotional and behavioral difficulties. However, research is lacking on the type of parenting practices that most strongly predict youth's sleep health.

Further, the majority of research on parenting practices and children's sleep has been exclusively conducted with infants and young children (El-Sheikh & Kelly, 2017), which widens the research gap on the nature of the relations between parenting and youth's sleep at other developmental stages. Importantly, growing evidence suggests youth sleep health is increasingly vulnerable to disruption around specific developmental periods (e.g., early adolescence; McMakin & Alfano, 2015), which warrants examination of familial factors that contribute to disrupted sleep in youth at different stages. Unfortunately, sensitive developmental periods for the relationship between parenting practices and youth sleep health are mostly unknown.

Scarce data on longitudinal models of parenting practices and youth's sleep at different developmental stages limit the clinical applicability of research findings on how to offer parents interventions that are tailored to optimize sleep health in youth at various stages of development. The identification of key parenting practices that impact youth's sleep health throughout development is integral to enhance interventions that address poor sleep and accompanying mental health difficulties in youth. Specifically, examining dynamics between positive (e.g., warmth, supportiveness) and negative (e.g., hostility, laxness) parenting, as well as ES practices and youth's sleep health, may explain under which parenting conditions youth's sleep health suffers or thrives across development. In turn, the literature on youth sleep warrants expansion on conceptual models, especially longitudinal designs, that can serve to inform interventions aiming to promote youths emotional and behavioral health by enhancing their sleep health. A thorough understanding of how constellations of parenting practices promote or stifle sleep health is not only uncharted research territory, but important to attempt to reduce the high

prevalence of sleep problems in youth and thereby prevent psychosocial problems that ubiquitously coexist with disrupted sleep in youth.

The current longitudinal study examined the relationship between parenting and youth's sleep problems. This study utilized a person-centered approach to identify profiles of parenting practices and ES strategies that are most predictive of sleep problems in youth. To explicate possible developmental differences and potentially discern sensitive periods, we investigated whether associations between distinct constellations of parenting practices and youth sleep problems differ across age groups. We predicted that positive and emotionally supportive parenting practices would predict lower levels of sleep problems in youth across all age groups. Conversely, we predicted that negative and emotionally unsupportive parenting practices would predict higher levels of sleep problems in youth across age groups. Lastly, we explored predictors of parenting profile membership to examine the influence of family income, parent and youth sex, and youth internalizing and externalizing problems on profile membership probability.

### **Method**

A sample of 292 parents of children between the ages of 3 and 14 from a larger study on the assessment of parenting were used for the current study. The parent study included a community sample of 564 parents who were recruited online through Amazon's Mechanical Turk (MTurk) and completed electronic surveys at four waves throughout a 12-month period. Sociodemographic information for the current study's sample is presented in Table 1.1. Given the community sample, only 16% of children were reported to experience clinically significant internalizing and externalizing



pathology. The current study examined data collected at the third (8-months) and fourth (12-month) waves as a relevant measure of ES was first incorporated at the third wave. Missing data were less than 1% for all study variables. Full maximum likelihood estimation techniques were utilized to include all available data.

## **Procedure**

MTurk, a dominant crowdsourcing application in the social sciences, was utilized to recruit parents and obtain study data. Inclusion criteria included being a parent of a child between the ages 3 and 17, who resided in the United States. Additionally, a minimum of 95% task approval rate was required, a criterion that ensures a high-quality sample of users with better reputations (i.e., approval rating) due to a history of consistently passing attention checks at a high rate, responding in less socially desirable manners, and providing reliable responses to questionnaires similar to those of “traditional” samples. Prior research has demonstrated that obtaining data from parents through crowdsourcing methods is as reliable as obtaining data through more traditional data collection methods (Parent & Forehand, 2017). Parents consented online prior to completing the survey following approved Institutional Review Board procedures. A 12-month study involving the completion of five surveys was listed on MTurk for which participants were compensated a total of \$22 for completing surveys.

To ensure that parents’ responses were not random, ten attention check items were included in the survey. Participants were excluded from the current study for having more than one incorrect response on these items. In addition, participants were also excluded for failing to report the same demographic characteristics across study waves. The 53 participants excluded were not included in the total sample above.

## Measures

**Demographic Information.** Parents responded to demographic questions about themselves (e.g., education, age), their children (e.g., sex, age) and families (e.g., household income).

**Youth Sleep Problems.** A shortened version of the Children's Sleep Habits Questionnaire (CSHQ; Owens, Spirito, & McGuinn, 2000) was used to measure youth sleep problems. The CSHQ is a widely used parent-report measure of youth sleep behavior that includes items relating to key sleep domains that encompass clinical sleep complaints (e.g., bedtime behavior, sleep onset and duration). The CSHQ has been demonstrated to correlate with objective measurements of sleep functioning and has been shown to be both reliable and valid in community and clinical samples. Parents reported the frequency of sleep behavior for the most recent or "typical" week on a four-point Likert scale that included the following response options: *usually* (5-7 times per week), *sometimes* (2-4 times per week), *rarely* (0-1 time per week), and *never* (less than once a week). The shortened version of the CSHQ inquired about sleep latency (i.e., amount of time it takes to fall asleep), consistency of sleep timing, continuity of sleep (i.e., amount of sleep versus wakefulness during sleep period), sleep efficiency (i.e., ratio of total sleep time to amount of time spent in bed), and daytime sleepiness. Higher scores represented greater sleep problems in youth. Given our interest in examining levels of problems across various sleep dimensions, we utilized a Total Sleep Disturbances index to reflect overall sleep problems in youth. A total score above 14 was used as the clinical cut-off which corresponded to one SD above the mean, similar to the clinical sleep

population mean used in the original CSHQ study. Cronbach's alpha in the current sample averaged 0.70 across both waves.

***Youth Internalizing and Externalizing Problems.*** Parents completed the 19-item Brief Problem Monitor which comprises items from the Child Behavior Checklist and Youth Self-Report and examines both internalizing and externalizing pathology (Achenbach et al., 2011). Excellent internal consistency test re-test reliability, and validity of the BPM has been previously demonstrated (Achenbach et al., 2011). Internal consistency for subscales at the third and fourth waves ranged from .82 to .88.

***Parenting Practices.*** The Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2017) is a self-report measure of parenting practices, whose 34 items were selected and subsequently adapted from well-established parenting scales). The Broadband Positive Parenting factor of the MAPS includes four narrowband subscales: Proactive Parenting, Positive Reinforcement, Warmth, and Supportiveness. The Broadband Negative Parenting factor includes three narrowband subscales: Hostility, Physical Control, and Lax Control. The MAPS has demonstrated strong reliability, and longitudinal examinations have provided support for its subscales' validity (Parent & Forehand, 2017). Cronbach's alphas in the current sample were 0.93 and 0.88 for the Positive and Negative Parenting domains, respectively.

***Emotion Socialization Strategies.*** The Coping with Children's Negative Emotions Scale (CCNES; Fabes, Eisenberg, & Bernzweig, 1990) is a self-report measure that includes 12 hypothetical emotionally evocative scenarios for youth in which caregivers rate how they would respond to their children's negative emotions (e.g., distress, fear). The CCNES includes six ways in which parents can respond to their

children's negative emotions and these include (1) emotion-focused reactions, which represent parental responses to make the child feel better, (2) problem-focused reactions, which represent parental responses to help the child solve a problem that caused his/her distress, (3) expressive encouragement, which represents parental responses that validate children's emotions while encouraging expression of negative affect, (4) distress reactions, which captures the distress experienced by parents when children express negative affect, (5) punitive reactions, which represent punitive parental responses to decrease exposure to children's negative affect, and (6) minimization reactions, which represent parental responses that minimize or devalue the situation and children's distress from it. The six subscales were grouped into the two broader domains of supportive (i.e., expressive encouragement, emotion-focused and problem-focused reactions) and unsupportive ES practices (i.e., distress, minimization, punitive reactions). The CCNES has previously demonstrated good internal and test-retest reliability as well as sensitivity to change over time (Herbert et al., 2013). Cronbach's alphas for the current sample were .0.95 and 0.90 for the supportive and unsupportive domains, respectively.

### **Data Analytic Plan**

Latent Profile Analysis (LPA) was conducted to identify profiles of parenting practices and their association with indices of youth sleep health. LPA analyses allow variables to cluster that have similar indicator means and variances in order to identify group patterns. Specifically, the goal of LPA is to determine the most accurate number of profiles to describe the associations within the observed variables (Roesch, Villodas, & Villodas, 2010).

**Profile Enumeration.** In order to determine the optimal number of profiles, we utilized the Lo-Mendel-Ruben adjusted likelihood ratio test (LMR-A), the bootstrap likelihood ratio test (BLRT), the Bayesian Information Criterion (BIC), the Akaike Information Criteria (AIC), the consistent Akaike Information Criteria (CAIC), the sample size adjusted BIC (ssBIC), and entropy to select the best fitting model (see Table 2). Specifically, the LMR-A indicates statistically significant improvements ( $p$ -value < .05) in a model in comparison to the model with one fewer profile (Cloitre et al., 2013). Similarly, a statistically significant BLRT indicates superiority of a model when compared to the model with one fewer profile (Cloitre et al., 2013). The AIC, consistent AIC (cAIC), BIC, and sample size adjusted BIC (ssBIC) aid in determining model fit, with lower values on each index indicating better relative fit. Further, entropy determines the accuracy of classifying individuals into the profiles identified in each model, with values closer to 1 indicating more certainty in group division. Importantly, the determination of number of constellations or profiles of parenting practices should be theoretically-driven and informed.

**Predicting Distal Outcomes.** When examining parenting profiles as predictors of youth sleep health, profile identification is often conducted through “hard classification,” that is, fixing individuals to a profile where they had the highest likelihood of membership. For the current study, we employed Vermunt’s three-step approach in Mplus (Bakk, Tekle, & Vermunt, 2013). Specifically, once profiles were determined, cases were assigned to these profiles based on posterior probabilities. Following that, family, parent, and youth covariates were introduced as predictors of the categorical latent class variable without needing to hard-classify nor resulting in distortion of

profiles. Finally, we used a three-step approach (Beebe, 2006) to examine the cross-sectional and longitudinal impact of latent parenting profiles on youth sleep problems. Specifically, youth sleep problems at baseline and at the 4-month wave (mean centered), and the stability of youth sleep problems across time were included at the latent class level so that estimates were unbiased by classification inaccuracy and without distorting class solution.

## Results

***Latent Profiles.*** Latent profile analyses (LPA) were conducted using *Mplus* version 8.3. Parenting practices, parent ES strategies, and youth sleep problems were converted into z-scores. Every profile indicator was entered into the LPA models, which ranged from one to five profiles and were run with 200 random starts. Fit indices for the five profiles are presented in Table 1.2. The three-, four-, and five-profile models all exhibited appropriate entropy. However, the three-profile model had superior fit compared to other models for the bootstrapped LRT, BIC, and entropy and represented the model that is most theoretically robust and empirically defensible (see Figure 1 for complete profiles). The four and five-class models had the same three primary classes and introduced classes that did not meaningfully add to the interpretation of the results. Thus, the three-class model was selected for further analysis.

The first parenting profile (33%), labeled as “High Support” was characterized as having the highest levels of positive parenting practices and supportive ES strategies paired with the lowest levels of negative parenting practices and unsupportive ES strategies. In contrast, the third parenting profile (14%), labeled as “Low Support” was characterized as having the lowest levels of positive parenting and supportive ES

practices and highest levels of negative parenting and unsupportive ES practices. The second parenting profile (53%), labeled as “Medium Support” demonstrated moderate levels of positive and negative parenting practices as well as moderate levels of supportive and unsupportive ES strategies. More specifically, the Medium Support profile exhibited higher levels of negative parenting practices than the High Support profile (Cohen’s  $d = .67$  to  $.71$ ), but much lower than the Low Support profile ( $d = 1.66$  to  $3.05$ ). Additionally, the difference in positive parenting between the Medium Support profile and both the High Support ( $d = -1.77$ ) and Low Support ( $d = 1.36$ ) was substantial.

Overall, LPA results supported three clearly delineated parenting profiles that longitudinally predict youth sleep problems. Following profile enumeration, we explored family (e.g., SES), parent (i.e., sex), and youth (i.e., age, sex, and problem behavior) predictors of parenting profile membership using multinomial logistic regression via Vermunt’s three-step approach<sup>28</sup> in *Mplus* (see Table 1.3 for complete results).

Family income (a proxy for family SES), youth sex, and youth internalizing problems (e.g., anxiety, depression) were not associated with parenting profile probability ( $ps > .10$ ). However, youth age was associated with parenting profile such that the odds of being in the Medium or Low Support profile, relative to the High Support profile, increased by 11% for every year youth got older. Specifically, the probability of a parent being in the High Support profile was approximately 45% for parents of young children (i.e., 3-8 years-old), but only 28% for parents of peri-pubertal youth (i.e., 9-14 years-old). Additionally, parent sex was associated with parenting profile such that fathers were more likely to be in the Low Support profile relative to mothers. Lastly, youth

externalizing problems (e.g., defiance, aggression) was associated with parenting profile such that the odds of being in either the Medium or Low Support profiles, relative to the High Support profile, increased with higher levels of youth externalizing problems.

***Youth Sleep Problems Outcomes.*** Next, we used a three-step approach (Bakk, Bilger, & Díaz-Morales, 2009) to examine the cross-sectional and longitudinal impact of latent parenting profiles on youth sleep problems. Wald's chi-square tests of parameter equality results indicated significant cross-sectional, Wald  $\chi^2 = 10.18(2), p = .006$ , and longitudinal, Wald  $\chi^2 = 8.19(2), p = .017$ , differences in youth sleep problems. Longitudinally, the parents in the High Support profile reported that their children had the lowest levels of sleep problems ( $m = 10.74$ , 95% CI 10.12, 11.35), as compared to the Medium ( $m = 11.6$ , CI 11.09, 12.1) and Low Support parenting profiles ( $m = 13.31$ , CI 12.3, 14.3). A similar pattern of means emerged for cross-sectional associations. As expected, the Low Support parenting profile predicted the highest levels of sleep problems in youth. The differences in youth sleep problems between the High and Medium Support profiles was small ( $d = .29$ ) whereas the youth sleep problems differences between the High Support and Low Support profiles was large ( $d = .88$ ) – 50% of youth of parents in the Low Support parenting profile were classified as having clinically elevated sleep problems relative to 12.5% of youth of parents in the High Support parenting profile. Of note, 21.4% and 26.3% of youth were reported to have sleep disturbances above the clinical cutoff in wave 3 and 4, respectively.

Lastly, we explored if youth age moderated the association between parenting profile and youth sleep problems by estimating distal outcomes separately for two youth developmental stages (i.e., childhood: 3-8-years-old, peripuberty: 9-14-years-old). The



association between parenting profile and youth sleep problems was significant for peripubertal youth, Wald  $\chi^2= 9.16(2), p = .010$ , but not for younger children, Wald  $\chi^2= 2.29(2), p = .318$ . Although the pattern of results was similar across developmental stages, the difference in sleep problems between the parenting profiles was most pronounced for peri-pubertal youth such that the Low Support parenting profile had its most detrimental impact on youth sleep health during peripuberty (see Figure 1). Intercorrelations among study variables are presented in Table 1.4.

### **Discussion**

The current study utilized a person-centered approach to identify profiles of parenting practices that differentially predict youth sleep problems. Specifically, we examined cross-sectional and longitudinal relations between distinct profiles of parenting practices and sleep problems in young children, school-age children, and peri-pubertal youth. Findings supported a three-profile model. Consistent with our hypothesis, we identified a profile of parenting that was cross-sectionally and longitudinally associated with the lowest levels of sleep problems in youth. Specifically, this profile, labeled as “High Support”, was characterized as having the highest levels of positive parenting practices and supportive ES strategies paired with the lowest levels of negative parenting practices and unsupportive ES strategies., relative to the other two parenting profiles. Conversely, we identified a profile of parenting that was cross-sectionally and longitudinally associated with the highest levels of sleep problems in youth, labeled as “Low Support”. This profile was characterized as having the lowest levels of positive parenting and supportive ES practices and highest levels of negative parenting and unsupportive ES practices (see Figure 1). Lastly, the most common parenting profile,

labeled as “Medium Support”, was characterized as having moderate levels of positive and negative parenting practices. This parenting profile predicted higher levels of youth sleep problems than the High Support profile, but lower than the Low Support profile.

Findings demonstrating that the High Support and Low Support parenting profiles differentially predicted sleep problems expands the literature on children’s sleep by highlighting the influence of positive parent-youth interactions on youth sleep health. Evidently, positive parenting practices may likely protect youth against sleep problems otherwise associated with negative parenting practices and/or dysfunctional family dynamics. Importantly, our findings are consistent with previous research highlighting the benefit of parental warmth, structure, and monitoring on youth’s sleep’s health.<sup>29</sup> Our findings also support previous theoretical propositions and empirical work by highlighting the role of maladjusted family relationships on disrupted sleep through possible increased vigilant states (e.g., concern, worry) and environmental threats (e.g., parent-youth conflict, parental nonsupportive reactions to youth distress) experienced by youth.<sup>19</sup> Our results expand the scant longitudinal area of inquiry of parenting and youth sleep by underscoring the quality of parenting practices and parent-youth interactions as important intervention targets, which have been largely unexplored in the behavioral treatment of disturbed sleep in youth. Indeed, youth sleep interventions generally have not targeted the quality of parenting practices directly, but rather mostly involved parents by providing them with sleep education and/or encouraging parent-set bedtimes.<sup>29</sup> Our results demonstrate a differential impact of distinct parenting profiles on youth sleep problems, highlighting the need to offer families parenting interventions that are tailored to promoting healthy sleep habits through reductions in parent-youth conflict and related

improvements in youth physiological states needed for sleeping. Notably, children's sleep health is embedded in the family milieu and parenting practices are merely one of the many family processes that ongoingly and bidirectionally relate to youth's poor sleep.<sup>5</sup> Further research is needed to conceptualize youth's sleep health using a transactional framework to disentangle the mechanisms whereby children's sleep-wake behaviors and parenting practices reciprocally influence one another.

Importantly, our moderation results demonstrated an increasingly detrimental effect of the Low Support profile on youth sleep health during peripuberty (9-14 years-old). In other words, the negative sequelae of negative and unsupportive parenting practices on youth disturbed sleep became more pronounced as youth got older and was only statistically significant for peripubertal youth. This is concerning given that biological and social changes lead to a normative increase in insufficient sleep, social jetlag (changes in sleep timing from weekdays to weekends), and other sleep related problems during the interval of time surrounding the onset of puberty.<sup>6</sup> Our results suggest that, although addressing parenting practices in the context of child sleep interventions throughout development is critical, the peripuberty period might present as a crucial developmental time to modify suboptimal parenting practices in hopes of improving youth sleep. Undeniably, parents will diminish their supervision and involvement in regulating their children's sleep-related behavior as youth grow older. However, parents continue to influence their children's sleep habits (e.g., sleep-wake routines, social media use), which suggests that continued work in this area is important. Indeed, previous literature indicates that adolescents' sleep health greatly benefits from parental monitoring and structure around sleep-wake behaviors.<sup>29</sup> However, without

proper tools and education at parents' disposal, instilling enforcement measures surrounding sleep routines is likely to be an area of conflict within the family, which ironically can serve to worsen problems with sleep by impeding the necessary low-arousal emotional state for adequate sleep. In turn, the identification of parenting profiles that most likely relate to disturbed sleep in youth supports the goal of refining intervention efforts by allowing personalization of services through the emphasis on modifying maladaptive parenting practices that perpetuate sleep problems in youth, paying particular attention to dynamics of youth at developmental risk for disturbed sleep. Certainly, future research that integrates family functioning and youth's sleep into models of child development is needed. To that aim, developmental models of sleep should incorporate findings on bidirectional links between shifts in the parent-youth relationship and youth sleep health across development as parenting practices could similarly be influenced by youth's sleep and other individual characteristics, resulting in a transactional system of influence reinforced by both children's and parents' behaviors

Lastly, examinations of predictors of profile membership indicated that fathers were more likely to be in the Low Support profile. This finding reinforces the need to cast the net more broadly when it comes to measuring parenting practices in mothers and fathers, which could clarify different parent-youth dynamics that may occur based on the role or sex of the parent. Undoubtedly, given the high variability in household composition and family structure, future research is needed to ascertain the differential influence of multiple family relationships on youth's sleep. Additionally, results demonstrated increased odds of being in the Medium and Low Support profiles in parents of youth with higher levels of externalizing problems. This finding is consistent with

prior research suggesting transactional influences between children's externalizing behavior and parenting quality<sup>31</sup> and with recent data linking parent ES behaviors to youth conduct problems.<sup>32</sup> Reciprocal influences between parenting practices and youth externalizing problems as well as established associations between externalizing behaviors and youth sleep problems further reinforce the potential of modifying parenting behaviors to not only promote adequate sleep, but also behavioral and emotional health in youth. Unexpectedly, youth internalizing problems were not associated with parenting profile probability, a surprising finding that may be related to reporter bias by parents given evidence of higher informant disagreement on youth internalizing pathology.<sup>33</sup> Future work should include multiple informants to clarify reciprocal effects among parenting practices and youth psychopathology within the context of youth sleep functioning. Lastly, family income (proxy for SES) was not associated with parenting profile probability. Future research with larger samples should explore whether associations between parenting practices and youth sleep are moderated by SES and/or adversity.

It is important to interpret the current findings in light of the study's limitations. First, a limitation includes lack of data on history of youth sleep disturbances as well as on medical conditions that may impact sleep, hampering our ability to draw specific conclusions on the directionality of the parenting practices-youth sleep problems relationship. This is important given links between neurodevelopmental disorders<sup>34</sup> and sleep problems as well as sleep disorders (e.g., obstructive sleep apnea)<sup>34</sup> and psychopathology. Future research should include such data to better inform models on youth's sleep health within the family environment. Second, we obtained the study's data

through a single reporter, increasing the risk of shared method variance and possibly resulting in skewed reports of parenting practices and youth's sleep due to social desirability biases and possible limited knowledge on youth's sleep habits, particularly those of older children. Nevertheless, our findings are consistent with previous research demonstrating an association between parenting and youth sleep health using multiple informants and observational measurements of parenting.<sup>35,14</sup> Future research should include reports by youth and additional caregivers. Obtaining information on adolescent's perceptions of parenting practices might shed light on the consistency of parenting practices within the rearing environment. Although research suggests that parents and adolescents generally agree on their reports of parenting, there is evidence that adolescent report of negative parenting is more congruent with independent observations of parenting practices.<sup>36</sup> As such, the adolescent perspective could more clearly illuminate potential dysfunctional parent-child transactional dynamics that interfere with youth's sleep. Third, we measured sleep problems based on caregiver's report on an abbreviated version of the CSHQ. The growth of the literature on youth sleep health warrants strong assessment of youth sleep health dimensions<sup>4</sup> through objective methodology (e.g., actigraphy) in future investigations. Fourth, although the longitudinal nature of the study is a notable strength, the non-experimental design prevents us from making definitive causal conclusions due to potential intervening variables. Future research should examine whether the experimental modification of parenting practices results in reduced sleep problems in youth. Lastly, our sample did not exclusively include youth with clinically elevated sleep problems nor clinically significant borderline or clinical psychopathology. There is a continued need to examine the link between parenting practices on youth sleep

health in clinical samples to further advance our understanding of children's clinically disturbed sleep within the influence of family relationships.

Despite the study's limitations, the findings from the present study serve as an important contribution to the literature by enhancing our understanding of youth's sleep health within the family context. Undoubtedly, pediatric sleep problems pose a serious risk to the physical and mental health of youth. Advancing our conceptualization on how parenting behaviors and family functioning relate to youth sleep health promotes further understanding of factors that pervasively contribute to the epidemic of youth sleep problems. Such empirical evidence can inform how to durably modify sleep dysfunction and promote adaptive psychosocial outcomes in youth with sleep problems. Our findings suggest that including caregivers in interventions that aim to promote healthy sleep practices in children and adolescents is a necessity. Additionally, the impact of negative parenting on disrupted youth sleep health underscores the need to enhance caregiver wellbeing to mitigate the adverse sleep and mental health consequences associated with high levels of parenting stress and family conflict. Consideration of transactional dynamics between family and parent functioning and youth sleep health is imperative to further understand how to best promote youth sleep health across development.

**Table 1.1.** Sociodemographic information for the present study sample.

| <b>Demographic Characteristic</b> | <b><i>M (SD) or %</i></b><br><i>N = 292</i> |
|-----------------------------------|---|
| Child Age                         | 8.4 (3.6)                                   |
| Child Sex (% Female)              | 50.3  |
| Parent Age                        | 36.51 (7.3)                                 |
| Parent Sex (% Mothers)            | 60.8  |
| Parent Race/Ethnicity             |   |
| White                             | 82  |
| Black                             | 8.9   |
| Latinx                            | 5.1   |
| Asian                             | 3   |
| Other                             | 1   |
| Family Structure                  |   |
| Single                            | 16.8  |
| Cohabiting                        | 63.5  |
| Married                           | 17.9  |
| Family Income                     |   |
| Under \$30,000                    | 21.7  |
| \$30,000 - \$49,000               | 28.7  |
| \$50,000 - \$69,000               | 19.5  |
| \$70,000 - \$99,000               | 16.8  |
| \$100,000 or more                 | 13.3  |
| Parent Education                  |   |
| Did not complete H.S              | 0.6   |
| H.S or GED                        | 13.9  |
| Some College                      | 26.7  |
| College Degree                    | 41.8  |
| More than College Degree          | 15.7  |

*Note:* H.S High School



**Table 1.2.** Latent profile analyses model fit indices.

| Profiles | LL       | Entropy | Parsimony Criteria |         |         |         | LRT p Value |      |
|----------|----------|---------|--------------------|---------|---------|---------|-------------|------|
|          |          |         | AIC                | BIC     | ssBIC   | CAIC    | LMRa        | BLRT |
| 1        | -1638.29 | --      | 3292.58            | 3321.99 | 2396.62 | 3329.99 | --          | --   |
| 2        | -1473.17 | .739    | 2980.35            | 3042.85 | 2988.94 | 3059.85 | .004        | .000 |
| 3        | -1407.99 | .810    | 2867.99            | 2963.58 | 2881.13 | 2989.58 | .139        | .000 |
| 4        | -1384.39 | .780    | 2838.79            | 2967.47 | 2856.48 | 3002.47 | .012        | .100 |
| 5        | -1363.62 | .779    | 2815.23            | 2977.01 | 2837.48 | 3021.02 | .021        | .150 |

**Table 1.3.** Predictors of profile membership.

| <b>Effect</b>                | <b>Estimate</b> | <b>SE</b>   | <b>OR</b>   | <b>95% CI</b>     |
|------------------------------|-----------------|-------------|-------------|-------------------|
| <i>Medium vs. High</i>       |                 |             |             |                   |
| Child Sex                    | -.164           | .340        | .849        | .436, 1.65        |
| Child Age                    | <b>.104</b>     | <b>.050</b> | <b>1.11</b> | <b>1.01, 1.22</b> |
| Parent Sex                   | .596            | .596        | 1.82        | .845, 3.90        |
| Family Income                | .068            | .068        | 1.07        | .956, 1.19        |
| Child Externalizing Problems | <b>.286</b>     | <b>.286</b> | <b>1.33</b> | <b>1.00, 1.77</b> |
| Child Internalizing Problems | .063            | .063        | 1.07        | .856, 1.36        |
| <i>Low vs. High</i>          |                 |             |             |                   |
| Child Sex                    | .149            | .507        | 1.16        | .430, 3.13        |
| Child Age                    | .105            | .070        | 1.11        | .968, 1.28        |
| Parent Sex                   | <b>1.27</b>     | <b>.544</b> | <b>3.54</b> | <b>1.22, 10.3</b> |
| Family Income                | .020            | .098        | 1.02        | .841, 1.23        |
| Child Externalizing Problems | <b>.514</b>     | <b>.154</b> | <b>1.67</b> | <b>1.24, 2.26</b> |
| Child Internalizing Problems | .118            | .134        | 1.13        | .865, 1.46        |

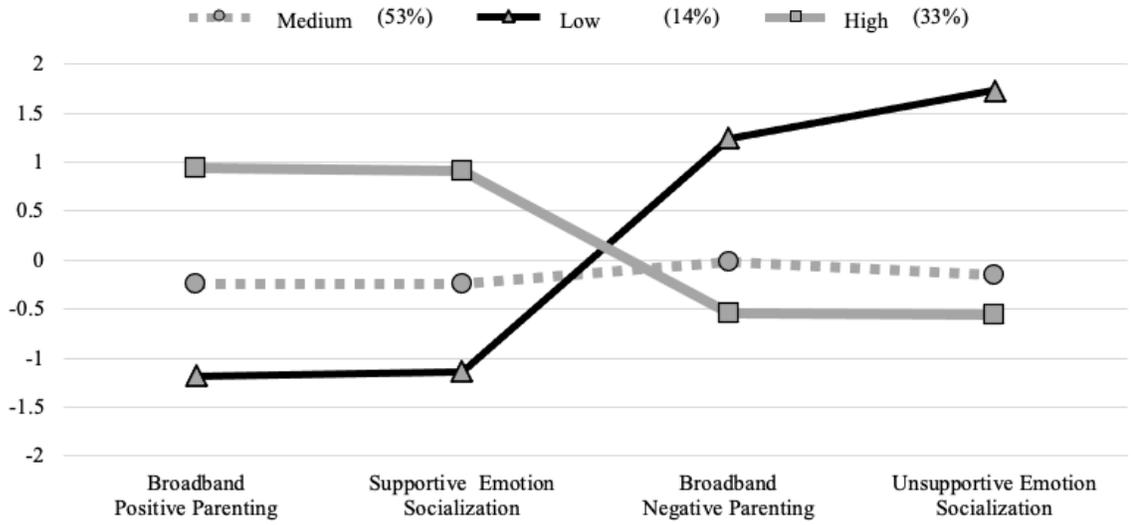
**Table 1.4.** Intercorrelations between study variables.

|                           | M (SD)      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     | 12     | 13     |
|---------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>8-Month Wave</b>       |             |        |        |        |        |        |        |        |        |        |        |        |        |        |
| 1. Sleep Problems         | 11.6 (2.9)  | 1      |        |        |        |        |        |        |        |        |        |        |        |        |
| 2. Externalizing Problems | 1.84 (2.4)  | .29**  | 1      |        |        |        |        |        |        |        |        |        |        |        |
| 3. Internalizing Problems | 1.46 (2.1)  | .34**  | .41**  | 1      |        |        |        |        |        |        |        |        |        |        |
| 4. Positive Parenting     | 4.14 (.55)  | -.29** | -.25** | -.21** | 1      |        |        |        |        |        |        |        |        |        |
| 5. Negative Parenting     | 1.83 (.47)  | .29**  | .46**  | .27**  | -.39** | 1      |        |        |        |        |        |        |        |        |
| 6. Supportive ES          | 5.21 (.93)  | -.20** | -.19** | -.05   | .69**  | -.36** | 1      |        |        |        |        |        |        |        |
| 7. Unsupportive ES        | 2.39 (.68)  | .26**  | .32**  | .18**  | -.45** | .53**  | -.42** | 1      |        |        |        |        |        |        |
| <b>12-Month Wave</b>      |             |        |        |        |        |        |        |        |        |        |        |        |        |        |
| 8. Sleep Problems         | 11.87 (3.2) | .60**  | .34**  | .31**  | .35**  | .36**  | -.19** | .28**  | 1      |        |        |        |        |        |
| 9. Externalizing          | 1.82 (2.5)  | .38**  | .73**  | .31**  | -.29** | .46**  | -.27** | .35**  | .39**  | 1      |        |        |        |        |
| 10. Internalizing         | 1.65 (2.2)  | .31**  | .38**  | .78**  | -.29** | .29**  | -.15** | .28**  | .34**  | .43**  | 1      |        |        |        |
| 11. Positive Parenting    | 4.13 (.55)  | -.29** | -.26** | -.18*  | .80**  | -.36** | .65**  | -.42** | -.35** | -.23** | -.21** | 1      |        |        |
| 12. Negative Parenting    | 1.83 (.48)  | .27**  | .48**  | .22**  | -.35** | .82*   | -.38*  | .49**  | .38**  | .54**  | .32**  | -.36** | 1      |        |
| 13. Supportive ES         | 5.21 (.94)  | -.16** | -.26** | -.03   | .62**  | -.34** | .81**  | -.41** | -.22** | -.11** | -.22** | .68**  | -.36** | 1      |
| 14. Unsupportive ES       | 2.39 (.71)  | .19**  | .31**  | .14*   | -.37** | .42**  | -.45** | .78**  | .22**  | .33**  | .25**  | -.42** | .52**  | -.51** |

*Note:* Intercorrelations are Pearson correlations, which are Point-Biserial correlations.

\* $p < .05$ . \*\* $p < .01$ . ES = Emotion Socialization

**Figure 1.** Z-scored parenting practices and parent emotion socialization strategies within three latent profiles.



## CHAPTER II

The Nighttime Parenting Scale: Assessing the Impact of Specific vs. General parenting practices on Youth's Sleep Health During a Sensitive Developmental Stage

*This manuscript is under review in Sleep Health.*

## **Abstract**

The current study provides a new framework for the impact of nighttime parenting practices on youth's sleep health during the sensitive transition from childhood to adolescence (i.e., peri-puberty). Specifically, we aimed to advance the measurement of nighttime parenting by developing a theoretically driven questionnaire for use in research and clinical settings. A total of 625 parents (67.9% mothers) of peri-pubertal youth (age  $M = 11.6$ ,  $SD = 1.31$ ) were recruited online through Amazon Mechanical Turk. Through four empirically-driven stages, a factor structure consisting of 6 dimensions of nighttime parenting was established, and strong psychometric properties of the final measure were ensured, all while meaningfully considering the developmental stage of peri-puberty as one susceptible to poor sleep. Further, the current study sought to validate nighttime parenting as a unique construct by exploring cross-sectional associations with peri-pubertal youth's sleep health. Lastly, we compared the incremental validity of said questionnaire over typically assessed general and/or daytime parenting practices. This study extends previous research by examining the influence of distinct domains of parenting practices that specifically occur at nighttime and how these differentially relate to youth's sleep health. Results suggests that intervention and/or prevention programs targeting sleep should place emphasis on fostering positive parenting at nighttime as a strategy for creating an evening environment that is conducive to enhancing youth's sleep health.

## **Introduction**

Sleep problems (e.g., trouble falling asleep, insufficient sleep, daytime sleepiness) in childhood and adolescence are highly prevalent and among the most pervasive complaints reported in pediatric primary care (American Academy of Sleep Medicine, 2010, Kelly & El-Sheikh, 2014). The significant impact sleep problems have on youth's cognitive, emotional, behavioral, and physical health constitutes an international public health concern (American Academy of Pediatrics, 2014; American Academy of Sleep Medicine, 2010). Sleep problems are ubiquitous to mental health disorders and have been consistently implicated in the development and maintenance of anxiety, mood, and other mental health problems (Sadeh, Raviv, & Gruber, 2000). Although many familial influences (e.g., parent-child relationship, marital conflict; El-Sheikh & Kelly, 2017) have been shown to impinge on children's sleep health, in this article, we will address how parenting practices, particularly those that occur at nighttime, may exert a substantial and unique influence on youth's sleep during a sensitive developmental stage. Specifically, the present study describes the development and validation of a new measure that assesses nighttime parenting practices and their relation to youth's sleep health. Here, we conceptualize youth's sleep health as a multivariable construct characterized by six dimensions: sleep-related behaviors, subjective satisfaction, alertness or daytime sleepiness, appropriate timing, high efficiency, and duration (Buysse, 2014; Meltzer, Williamson, & Mindell, 2021).

## **Sleep Health in Early Adolescence**

There is growing evidence that the developmental period around the transition from childhood to adolescence (9-14 years-old, “peri-puberty”) is uniquely sensitive to insufficient and/or poor-quality sleep (Blake et al., 2016; Kelly & El-Sheikh, 2014). Specifically, hormonal, neuropsychological, and social developmental shifts that characterize peri-puberty have been shown to affect sleep-wake regulation and make sleep increasingly vulnerable to disturbance (McMakin & Alfano, 2015; Blake et al., 2016). For instance, physiological susceptibilities (e.g., delayed circadian rhythms, reduced rate of homeostatic drive to sleep (Crowley, Acebo, & Carskadon, 2006), changes in affective processing (e.g., regulation, reactivity; Sadeh et al., 2009), and socio-contextual factors (e.g., electronic media, extracurricular activities, employment; Crone & Dahl, 2012) have been identified as unique developmental experiences associated with poor sleep among peri-pubertal youth. In turn, during peri-puberty, sleep undergoes pronounced changes (Sadeh et al., 2009), and there is increasing evidence for how problems with sleep at this developmental time predict escalating rates of anxiety, depression, and suicide later in adolescence (Alvaro, Roberts, & Harris, 2013; Kelly & El-Sheikh, 2014; Narmandakh, Roest, Jonge, & Oldehinkel, 2020; Shimizu et al., 2020). Overall, approximately 70% of teens in the United States report insufficient sleep (National Sleep Foundation, 2014), with rates concerningly higher (85%) for peripubertal youth with internalizing pathology (e.g., anxiety, depression; McMakin & Alfano, 2015).



## **Youth's Sleep Problems Within the Family Context**

Youth's sleep-wake behaviors are embedded within the family milieu, and as such, sleep problems have been demonstrated to be shaped by family relationships and functioning (El-Sheikh & Kelly, 2017). Indeed, contrary to adults, youths' regulation of their sleep-wake behaviors may be lessened by their limited control over how dynamic and complex family processes (e.g., parents' marital discord, use of electronics at bedtime, family caffeine consumption) exert a significant influence over their sleep health (Meltzer, Williamson, & Mindell, 2021). Parenting practices are one of the many family processes that relate to youth's poor sleep (e.g., Acosta et al., 2021). Specifically, whereas positive and emotionally supportive parenting practices (e.g., warmth, supportiveness, limit setting) have been linked with more optimal sleep in youth, negative and emotionally unsupportive parenting practices (e.g., hostility, emotion minimization, laxness) have been linked to higher rates of sleep problems (Acosta et al., 2021, Meltzer & Mindell, 2007). Notably, recent longitudinal and cross-sectional evidence suggests that the detrimental sequelae of negative parenting practices on youth's sleep health appears to be more pronounced during peri-puberty (Acosta et al., 2021). This transitional developmental period is one in which parents are often less involved in scaffolding bedtime routines (e.g. fostering feelings of safety by reading stories, winding down), yet parenting practices (e.g. limit setting around media use or bedtimes) can still impact children's sleep health. For example, positive parent-youth interactions characterized by warmth, closeness, and clear limit setting may support children's ability to manage their emotions, especially negative ones (e.g., anxiety), and thus protect youth against

nighttime affective states (e.g., vigilance, arousal) known to disrupt sleep (Dahl, 1996). It is also important to note that parenting practices around youth's sleep-wake behaviors are likewise impacted by youth's individual characteristics, highlighting an ongoing transactional system of influence between youth's sleep-wake behaviors and their parents' practices (El-Sheikh & Kelly, 2017, Sadeh, Tikotzy, & Scher, 2010). As an example, sleep problems in youth have been shown to predict increased maternal negativity and decreased maternal sensitivity and closeness (Bell & Belsky, 2008).

### **Nighttime Parenting and Youth's Sleep Health**

The emergent literature on youth's sleep health suggests a unique influence of nighttime parenting on youth's sleep. Nighttime parenting refers to practices related to children's bedtime and sleep routines, which may be distinct from daytime parenting. Prior research has documented the relationship between parenting practices at night and sleep patterns and trajectories of children within the first months of life (Sadeh et al., 2010, McDaniel & Teti, 2012, Teti & Crosby, 2012). For example, increased parental involvement at nighttime has been associated with more fragmented sleep (i.e., increases in number and duration of night wakings) in infancy given potential interference with children's self-soothing development (Sadeh et al., 2010). For older youth (i.e., 10-14 years-old), parenting practices promoting bedtime routine adherence and parental monitoring of waking activities (e.g., caffeine consumption, smart phone use) have both been linked to longer sleep durations – associations that have been hypothesized to occur via increased structure and emotional security within the parent-youth relationship (Gunn et al., 2019).

The nascent status of the nighttime parenting literature leaves several gaps in knowledge. Most notably, nighttime parenting practices have been studied primarily within the early childhood context (e.g., infancy and toddlerhood) while it remains unknown if or how these practices change across development. The impact of nighttime parenting on youth's sleep health during the sensitive period of peri-puberty could reveal that parenting practices that occur in the evening hours or prior to bedtime may more powerfully impact youth sleep health given established links between evening family environments and youth sleep (El-Sheikh & Kelly, 2017). Indeed, parenting practices utilized in a specific context have been identified as a more powerful predictor of youth behavior in the same specific context when compared to general parenting practices utilized throughout the day (Sanders et al., 2016).

Parents continue to influence older youths' sleep habits despite their diminished involvement in the bedtime routine (Randler, Bilger, & Diaz-Morales, 2009). Most sleep interventions for adolescents involve parents by providing sleep education and/or bedtime enforcement measures, but these studies have yielded mixed evidence on the effectiveness of parental involvement in improving youth sleep outcomes (e.g., Short et al., 2011, Bonnar et al., 2015). This suggests that bedtime routine adherence alone may not fully optimize youth's sleep health and that additional parenting practices may be needed to support longer, deeper, and more restful sleep in youth. Comprehensive and distinct assessments of nighttime parenting as a unique predictor of youth's sleep health may further explicate children's sleep within the context of the family. Indeed, advancing our understanding of nighttime parenting and how it relates to youth's sleep health may

reveal specific parenting practices for targeted treatment, and further delineate how family context contributes to aspects of youth sleep health.

### **The Current Study**

For the current study, we aimed to develop a multidimensional measure of nighttime parenting practices that is theoretically driven, of high utility in both clinical and research settings, and has strong psychometric properties. To provide a new conceptual framework and address limitations in the existing literature, we explored nighttime parenting practices of caregivers of peri-pubertal youth as this family domain has been primarily studied with infants and young children *and* given peri-pubertal youth's vulnerability to disturbed sleep and related negative trajectories of mental health illness that are set in motion at this sensitive time in development. A priori hypotheses include that "positive" parenting practices (e.g., warmth, positive quality time, limit setting) would be associated with better indices of youth's sleep health, such as lower sleep disturbances, daytime sleepiness or sleep-related impairment, and sleep onset latency (i.e., how long it takes to transition from wakefulness to sleep), and sleep-promoting practices (i.e., hygiene). Alternatively, we hypothesize that "negative" parenting practices (e.g., hostility, physical aggression, lax control) would be associated with indices reflecting poorer sleep health in youth, such as higher sleep disturbances, daytime sleepiness, and sleep onset latency, and poorer sleep hygiene.

The current study consisted of four stages, which included the development of the initial nighttime parenting items, trimming of the items, the exploration of the underlying factor structure of the scale, the examination of the sub-scale score internal and test-retest

reliability, and lastly, the validation of nighttime parenting as a unique parenting construct. Although an empirically-based methodology was implemented for the purposes of the questionnaire's development, a theoretical and conceptual model of nighttime parenting *and* relevant clinical experiences were leveraged to obtain the final factor structure.

## **Method**

### **Participants**

Data from 625 parents of youth between the ages of 9 to 14 were included in the current study. Overall, 92.5% of parents completing the forms were biological parents, with 67.9% responders being female. The sample was primarily White (67.4%), and most parents reported having obtained a college degree (60.9%). Additionally, most parents reported having a family income of above \$50,000 (67.4%). Lastly, approximately half of youth were males (50.3%), and the average age of youth was 11.6 years-old (see Table 2.1 for full sample demographics).

### **Procedure**

With approval from the University's Institutional Review Board, parents of 9- to 14-year-old youth were recruited via Amazon's Mechanical Turk (MTurk). Parents were consented online prior to beginning the survey and were compensated \$2.00 for the completion of the initial survey and \$2.00 for the follow-up assessment two weeks later. Data were collected from March of 2020 to February of 2021 during three independent waves (March 2020, April 2020, and February 2021). Analyses included wave as a

covariate to account for potential distinct functioning related to the COVID-19 pandemic timeline.

MTurk is currently the dominant and most widely used internet-based crowdsourcing application in the social sciences (Chandler et al., 2015) and has become a popular method for recruiting large samples at relatively low cost online (Shapiro, Chandler, & Mueller, 2014). On MTurk, workers browse Human Intelligence Tasks (HITs) by title, keyword, reward, and availability, and complete HITs of interest. They are paid by requesters upon successful completion of tasks (for an introduction to using MTurk, see Mason & Suri, 2012). Participants are anonymous to requesters, which protects respondent anonymity and therefore increases response rates (O’Neil & Penrod, 2001). Previous research has demonstrated MTurk to be reliable and valid in child and family research (Parent et al., 2017; Jensen-Doss et al., 2021). The retention rate for parents was 80% for the two-week follow-up assessment.

## **Measures**

*Nighttime Parenting Scale.* The Nighttime Parenting Scale (NPS) assesses parenting practices in the nighttime hours (i.e., 2 hours prior to child's bedtime) and around youth’s bedtime. Parents responded to each item using a 5-point Likert rating scale from 1 (*never*) to 5 (*always*). Prior to recruiting, the initial 86 nighttime parenting items were developed, some of which were created based on the authors’ clinical experiences with youth with sleep problems, while others were modified from an existing and established parenting scale (i.e., Multidimensional Assessment of Parenting Scale,

MAPS, Parent & Forehand, 2017) to reflect the nature of parent-youth interactions that occur specifically during the *nighttime*.

***General Parenting Practices.*** The Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2017) was used to assess different domains of general parenting practices, and consequently, to establish convergent and incremental validity of the NPS. The MAPS is composed of 34 items that make up a Positive and Negative broadband parenting factors. The 16-item Positive Parenting subscale includes the following domains: Proactive Parenting, Positive Reinforcement, Warmth, and Supportiveness. The 18-item Negative Parenting subscale includes these additional domains: Hostility, Lax Control, and Physical Control. Parents responded to each item using a 5-point Likert rating scale from 1 (*never*) to 5 (*always*). McDonald's omega were .90 and .91 for the Positive and Negative domains, respectively.

***Parental Emotion Socialization Strategies.*** The Coping with Children's Negative Emotions Scale – Adolescent Version (CCNES-A; Fabes, Eisenberg, & Bernzweig, 1990) was used to assess parents' reactions to their children's negative emotions, and to establish convergent and incremental validity of the NPS. The CCNES presents 12 hypothetical emotionally evocative scenarios for youth in which parents rate how they would respond to their children's negative emotions (e.g., distress, fear). The CCNES includes six different ways in which parents can respond to their children's emotions, which in turn make up two broader domains of parent reactions: Supportive (i.e., problem-focused, emotion-focused, and expressive encouragement) and Unsupportive

(i.e., distress, minimization, and punitive reactions). McDonald's omega were .95 and .93 for the Supportive and Unsupportive scales, respectively.

***Youth's Sleep Health.*** Parents reported on their children's sleep via a parent proxy version of the Children's Report of Sleep Patterns (CRSP; Meltzer, et al., 2012) and of the Patient-Reported Outcomes Measurement Information System (PROMIS) Pediatric Sleep-Related-Impairment (Forrest et al., 2018). These measures were included to establish predictive validity of the NPS. The CRSP is a 60-item questionnaire that assesses three domains of sleep health: Sleep Patterns (e.g., bedtimes, wake times, sleep onset latency, naps), Sleep Hygiene (e.g., caffeine use, sleep location, electronic use at sleep onset), and Sleep Disturbance (e.g., bedtime fears, insomnia, parasomnia).

The CRSP also assesses Daytime Sleepiness. Specifically, the Sleep Patterns scale includes data that is meant to be used descriptively. Estimated nighttime sleep duration and sleep efficiency were calculated based on this data. Specifically, nighttime sleep duration was calculated by subtracting estimated sleep onset latency and night waking duration from sleep opportunity (i.e., bedtime to waketime) and sleep efficiency was calculated by dividing estimated nighttime sleep duration by sleep opportunity. For each of the three domains, higher scores indicate worse sleep hygiene or greater sleep disturbances. The CRSP has been demonstrated to be reliable and valid as a measurement of sleep health in youth (Meltzer et al., 2013). McDonald's omega were .77, .82, and .83 for the Sleep Hygiene, Sleep Disturbances, and Daytime Sleepiness scales, respectively. Additionally, the PROMIS Parent Proxy Sleep-Related Impairment (SRI) is an 8-item questionnaire that inquires about a full range of sleep-related impairments (e.g., "My



*child was sleepy during the daytime*) through a 5-point Likert rating scale from 1 (*never*) to 5 (*always*). McDonald's omega for the PROMIS SRI was .95.

**Youth Mental Health.** The PROMIS Parent Proxy Anxiety and Depressive Symptoms short forms are parent-report measures that independently assess anxiety and depressive symptoms in youth ages 5 to 17 (Varni et al., 2012). Strong psychometric properties have been demonstrated for both scales (Varni et al., 2012). McDonald's omega were .94 and .90 for the Anxiety and Depressive Symptoms scales, respectively. Additionally, parents reported on their children's externalizing and internalizing pathology through the Brief Problem Monitor (BPM, Achenbach et al., 2011). This 19-item scale, derived from the Child Behavior Checklist and Youth Self-Report has been demonstrated to have excellent reliability, validity, and internal consistency (Achenbach et al., 2011). McDonald's omega were .91 and .77 for the externalizing and internalizing subscales, respectively. These measures were included to establish predictive validity of the NPS.

### **Data Analytic Plan**

Analyses were conducted in four stages to examine the measure's underlying factor structure and psychometric properties. For Stage 1, the total sample was randomly split into two, and as such, half of the study sample ( $n = 315$ ) was included in the exploration of the underlying factor structure of the data through exploratory factor analyses (EFA). Collected waves were similarly split across EFA and CFA samples. EFA was conducted in Jamovi (Jamovi 1.6, 2021) using maximum likelihood estimation with promax rotation. These analyses were data-driven and iterative based on four criteria (a)

item factor loadings above .50, (b) not having a cross-loading above .30, (c) theoretical relevance of items and factors, and (d) overlap or redundancy of items to ensure a brief overall scale. Through an iterative process, EFA was conducted several times, during which items were continually dropped based on the criteria described above. Retained items were included in next stage of analyses (i.e., CFA).

For Stage 2, data from the other half of the sample ( $n = 310$ ) was utilized to run confirmatory factor analyses (CFA) in R using Lavaan, with the goal of statistically testing fit and of building an explicit model of the factor structure underlying the data. The following fit statistics were used to evaluate model fit: Chi-square ( $\chi^2 > .05$  excellent), comparative fit index (CFI;  $>.90$  acceptable,  $>.95$  excellent), root mean square error of approximation (RMSEA;  $<.08$  acceptable;  $<.05$  excellent), and the standard root mean square residual (SRMR;  $<.08$  acceptable,  $<.05$  excellent). Additional items were removed at this stage based on replication of results across an independent sample and retaining the most robust items in each subscale. Stage 2 also examined measurement invariance across youth sex and age (9 to 11 vs. 12-14) as well as parent race, ethnicity, and education. Three different forms of measurement invariance were tested using multiple group confirmatory analyses: configural (i.e., identical factor structure for each stage), metric (i.e., factor loadings are held equal across groups), and scalar (i.e., factor loadings and intercepts/thresholds are held equal across groups).

Further, Stage 3 included the entire sample ( $N = 625$ ) to establish internal consistency (i.e., alpha and omega) and two-week test-retest reliability by conducting bivariate correlations between both collected waves of the *NPS*. Finally, Stage 4 also

included the entire study sample and focused on conducting initial validity tests examining cross-sectional associations between nighttime parenting practices and indices of general parenting practices, youth sleep, and youth mental health outcomes. Additionally, Stage 4 examined the unique predictive capability of each scale by simultaneously entering all scales into each regression model. Hierarchical regression analyses were then conducted to examine the incremental utility of NPS over and above general parenting practices. Specifically, previously validated measures of general parenting were added in Step 1, while our new nighttime parenting scales were added in Step 2.

## **Results**

### **Stage 1 – Exploratory Factor Analyses**

EFA results demonstrated 6 factors within the NPS (see Table 2.2 for the final EFA results). Emergent factors described the following parenting practices: Supportiveness (e.g., *“If my child had a difficult day, I comfort my child at night”*, *“I listen to my child’s ideas and opinions in the evening”*); Hostility (e.g., *“I have to yell to get my child to go to bed at night”*, *“I argue with my child to get them to go to bed”*); Physical Control (e.g., *“I spank my child with my hand in the evening because they have done something wrong”*, *“I use physical punishment [for example, spanking] in the evening hours to discipline my child because other things I have tried have not worked”*); Limit Setting (e.g., *“I promote a consistent bedtime for my child during school nights”*, *“Even if my child whines or complains, I make sure that they go to bed at a consistent time during school nights”*); Media Monitoring (e.g., *“My child is allowed to use*

*electronic devices before going to bed on school nights”, “I limit my child’s screen time before bedtime”); and Co-Sleeping Behaviors (e.g., “If my child doesn’t want to sleep alone, I let them sleep with me”, “I lie next to my child at night until they fall asleep”).*

## **Stage 2 – Confirmatory Factor Analyses**

Items retained in Stage 1 were used to conduct CFA with the other half of the total sample ( $n = 310$ ). At this stage, a few items (i.e., 7) were dropped on Stage 2 based on lower factor loadings and theoretical redundancy with other items within the same factor. Additional items (i.e., 4) that showed potential differential item functioning across child sex, youth developmental stage (i.e., 9-11 vs. 12-13), parent race, ethnicity, and education were also dropped. Specifically, measurement invariance (i.e., “*I spank my child in the evening for not completing their chores*” and “*I argue with my child to get them to go to bed*”) was tested across youth sex and developmental stage, resulting in two items demonstrating bias and thus, being excluded. After removing these two items, the nighttime parenting scale demonstrated configural, metric, and scalar invariance across youth sex and developmental stage, suggesting that parents interpret and respond to items similarly regardless of their child’s sex or age. Additionally, with respect to parental race, parents who identified as Black were compared to non-Black parents, while parents who identified as Asian were compared to non-Asian parents to examine if the same underlying construct or content of each item was perceived and interpreted similarly across groups. We also examined invariance across parent ethnicity (i.e., Hispanic vs. non-Hispanic) and parental education level (i.e., no 4-year college degree vs. at least 4-year college degree). Two additional (i.e., “*I listen to my child’s ideas and opinions in*

*the evening*” and “*My child and I laugh often at night*”) items demonstrated potential differential item functioning across parent race, ethnicity, and education and were therefore removed. After the removal of these items, the measure demonstrated configural, metric, and scalar across all scales indicating that parents are interpreting and responding similarly regardless of their own race, ethnicity, or level of education. The final 6-factor structure demonstrated good model fit,  $\chi^2(215) = 374.46, p < .01$ , RMSEA = .051, 90% CI .042 - .060, CFI = .944, SRMR = .054. (see Table 2.2 for final CFA results).

### **Stage 3 – Internal and Test-Retest Reliability**

***Internal Consistency.*** Coefficient omega was calculated for each of the six subscales at baseline in SPSS using the Hayes omega macro (Hayes & Coutts, 2020). Bootstrapping was used to obtain 95% confidence intervals for internal consistency for each subscale. Additionally, alpha coefficients were also calculated. Reliability was good for Supportiveness ( $\Omega = .80$  [.77 to .83],  $\alpha = .80$ ), Hostility ( $\Omega = .79$  [.75 to .82],  $\alpha = .79$ ), Physical Control ( $\alpha = .81$  [.74 to .86]), Co-sleeping ( $\Omega = .83$  [.77 to .84],  $\alpha = .81$ ), Limit-Setting ( $\Omega = .78$  [.72 to .81],  $\alpha = .77$ ), and Media-Related Behaviors ( $\Omega = .78$  [.73 to .81],  $\alpha = .77$ ).

***Test-Retest Reliability.*** At all three waves, the study sample was re-assessed 2 weeks after baseline (80% retention) to establish test re-test reliability. Bivariate correlations among the six subscales demonstrated that two-week test-retest reliability was strong for all factors indicated by high correlations for Supportiveness,  $r = .77, p < .01$ , Hostility,  $r = .74, p < .01$ , Limit-Setting,  $r = .76, p < .01$ , and Co-sleeping,  $r = .84, p$

< .01, and moderate correlations for Physical Control,  $r = .68$ , and Media-Related Behaviors,  $r = .53$ ,  $p < .01$ .

#### **Stage 4 – Validity**

***Convergent Validity.*** See Table 2.3 Factor 1, nighttime Supportiveness, was significantly correlated conceptually similar subscales on the MAPS (i.e., Supportiveness, Warmth) and on the CCNES (i.e., supportive emotion socialization). On the other hand, nighttime Supportiveness was negatively correlated with unsupportive emotion socialization practices (CCNES). Factor 2, nighttime Hostility, was significantly correlated with the MAPS general Hostility subscale as well as with unsupportive emotion socialization practices. Further, Factor 3, nighttime Physical Control, was significantly correlated with general Physical Control and unsupportive emotion socialization practices. Factor 4, nighttime Limit-setting, was significantly correlated with the MAPS Proactive Parenting and Positive Reinforcement subscales, while negatively correlated with the MAPS Lax Control subscale. Factor 4 was also significantly correlated supportive emotion socialization practices. Additionally, Factor 5, nighttime Media Monitoring, was significantly and negatively correlated with the Activities-Before-Bedtime subscale on the CRSP; however, it was not significantly correlated with the Electronic-Use-at-Sleep-Onset subscale of the CRSP. Finally, Factor 6, Co-Sleeping, was significantly correlated with the Sleep-Location subscale of the CRSP.

***Predictive Validity.*** We examined the intercorrelations between NPS factors and different youth sleep and mental health variables (see Table 2.4 for results). Overall,

positive nighttime parenting practices such as supportiveness and limit-setting were globally associated with better youth sleep indices including longer sleep duration, higher sleep efficiency, and satisfaction as well as lower sleep disturbances. These positive practices were also negatively correlated with youth externalizing and internalizing problems. On the other hand, negative nighttime parenting practices, such as hostility and physical control, were globally associated with worse youth sleep hygiene, insomnia, bedtime worries, and shorter sleep duration as well as with higher sleep-related impairment. Negative nighttime parenting practices were also positively correlated with youth externalizing and internalizing problems. Further, nighttime media-related behaviors were positively associated with youth sleep satisfaction. Lastly, co-sleeping was associated with worse youth sleep hygiene and satisfaction as well as with higher sleep disturbances, bedtime worries, sleep-related impairment, and internalizing problems.

***Unique Predictive Validity.*** We examined the unique predictive capability of each subscale by including all of them within the same regression model when predicting a relevant youth outcome. As illustrated in Table 2.5, trends in the factors' unique predictive validity included negative nighttime parenting practices (i.e., Hostility) predicting youth sleep and mental health outcomes above and beyond positive parenting practices (i.e., Supportiveness). Indeed, when all factors of the NPS were entered into the regression model together, Hostility was significantly associated with *every* youth sleep and mental health outcome. Similarly, nighttime Physical Control was shown to significantly associate with worse indices of youth sleep (i.e., hygiene, sleep onset

latency, sleep-related impairment) and mental health (i.e., depressive symptoms, externalizing problems). Notably, parents' nighttime limit-setting was predominantly and significantly associated with better indices of youth's sleep health (i.e., duration, hygiene, satisfaction, sleep-related impairment).

***Incremental Validity.*** Utilizing hierarchical regression, we examined the incremental validity of the NPS factors over and above the impact of general daytime parenting practices measured by the MAPS. Results demonstrated that Factor 1, nighttime Supportiveness, predicted youth externalizing symptoms ( $\beta = -.17$ ,  $t = -3.14$ ,  $p = .002$ ,  $\Delta R^2 = .07$ ) above and beyond the impact of the general positive parenting. Nighttime supportiveness also significantly predicted youth sleep hygiene ( $\beta = .11$ ,  $t = 1.96$ ,  $p = .05$ ,  $\Delta R^2 = .010$ ) above the impact of general supportiveness and warmth. Nighttime hostility significantly predicted youth sleep hygiene ( $\beta = .19$ ,  $t = 3.961$ ,  $p < .001$ ,  $\Delta R^2 = .069$ ), sleep disturbances ( $\beta = .34$ ,  $t = 7.15$ ,  $p < .01$ ,  $\Delta R^2 = .24$ ), sleep onset latency ( $\beta = .22$ ,  $t = 4.14$ ,  $p < .001$ ,  $\Delta R^2 = .04$ ), sleep satisfaction ( $\beta = -.25$ ,  $t = -4.76$ ,  $p < .001$ ,  $\Delta R^2 = .06$ ), and more specifically, insomnia ( $\beta = .31$ ,  $t = 6.52$ ,  $p < .001$ ,  $\Delta R^2 = .189$ ), bedtime worries ( $\beta = .29$ ,  $t = 5.92$ ,  $p < .001$ ,  $\Delta R^2 = .16$ ), daytime sleepiness ( $\beta = .25$ ,  $t = 5.21$ ,  $p < .001$ ,  $\Delta R^2 = .16$ ), and SRI ( $\beta = .38$ ,  $t = 8.15$ ,  $p < .01$ ,  $\Delta R^2 = .23$ ) above and beyond general hostility. Nighttime physical control significantly predicted youth sleep hygiene ( $\beta = .22$ ,  $t = 3.28$ ,  $p = .001$ ,  $\Delta R^2 = .12$ ), sleep disturbances ( $\beta = .19$ ,  $t = 2.71$ ,  $p = .007$ ,  $\Delta R^2 = .08$ ), insomnia ( $\beta = .17$ ,  $t = 2.44$ ,  $p = .01$ ,  $\Delta R^2 = .033$ ), daytime sleepiness ( $\beta = .23$ ,  $t = 3.60$ ,  $p < .001$ ,  $\Delta R^2 = .19$ ), and SRI ( $\beta = .14$ ,  $t = 2.09$ ,  $p = .03$ ,  $\Delta R^2 = .12$ ) above and beyond general physical control practices. Further, nighttime limit-setting



significantly predicted youth nighttime sleep duration ( $\beta = .25$ ,  $t = 5.05$ ,  $p < .001$ ,  $\Delta R^2 = .05$ ) sleep hygiene ( $\beta = -.10$ ,  $t = -2.33$ ,  $p = .02$ ,  $\Delta R^2 = .08$ ), sleep satisfaction ( $\beta = .15$ ,  $t = 3.43$ ,  $p = .001$ ,  $\Delta R^2 = .06$ ) and SRI ( $\beta = -.19$ ,  $t = -5.29$ ,  $p < .001$ ,  $\Delta R^2 = .30$ ) above and beyond general lax control, proactive parenting, and positive reinforcement practices.

### Discussion

The current study developed a valid multi-dimensional measure of nighttime parenting practices as evidenced by strong internal consistency and test-retest reliability. Additionally, the measure's factors were associated with relevant sleep variables and with conceptually similar parenting subscales, offering evidence for its predictive and convergent validity. Although empirically-based methodology (Achenbach, 2009) was implemented for the purposes of the questionnaire's development, a strong theoretical and conceptual model of nighttime parenting *and* relevant clinical experiences were leveraged to establish a foundation from which the item pool was created and/or retrieved.

The current study utilized data from 625 parents across a 4-stage empirical approach. Stages 1 and 2 of the NPS development resulted in a factor structure of six subscales: *Nighttime Supportiveness*, which includes items representing positive and/or emotionally supportive parenting practices such as spending quality time, encouraging emotional expression, openness to youth's ideas and opinions, and comforting behaviors; *Nighttime Hostility*, which includes items representing coercive parenting practices such as yelling, arguing, and/or losing one's temper at bedtime; *Nighttime Physical Control*, which included items representing physical discipline and physically aggressive

behaviors (e.g., spanking) out of anger at bedtime; *Nighttime Limit-setting*, which includes items representing permissiveness around bedtimes and nighttime routines; *Nighttime Media Monitoring*, which includes items representing practices of monitoring youth's nighttime media use; and finally, *Nighttime Co-Sleeping Behaviors*, which includes items representing practices of sleeping in the same bed until youth fall asleep on their own or because youth requested it (see Supplemental Appendix for the final NPS).

Further, Stage 2 of the NPS development also included analyses of measurement invariance. At this stage, four items that showed potential bias towards key youth and parent demographic variables were eliminated. These removals supported full measurement invariance of the final structure of the NPS across youth sex and developmental stage as well as across parent race, ethnicity, and education. This important step is a clear strength of the developed scale given the scarcity of measures with established measurement invariance in parenting and clinical research, especially across diverse racial and ethnic groups (Rodriguez et al., 2021).

Further, Stage 3 entailed establishing the reliability properties of the scale. Results demonstrated strong internal reliability for most factors including Supportiveness, Hostility, Physical Control, and Co-Sleeping, as evidenced by omega and alpha coefficients above .80. The remaining factors, Limit-Setting and Media Monitoring, demonstrated acceptable internal reliability. These results may be due to the limited number of items (i.e., 3) included within each of these factors. Nevertheless, internal reliability coefficients for Limit-Setting and Media Monitoring were within the

acceptable range (above .70). Additionally, two-week test-retest reliability was strong for Supportiveness, Hostility, Limit-Setting, and Co-Sleeping, and moderate for Physical Control and Media Monitoring (.66, .53). Lower test-retest reliability may reflect that parenting practices around physical control or media monitoring may fluctuate week-to-week based on parent mood, stress and competing priorities to a greater extent than positive or negative parent-youth interactions and co-sleeping behaviors.

Furthermore, Stage 4 of the current study entailed examining the initial validity of the NPS. With respect to convergent validity, results demonstrated meaningful overlap between conceptually similar subscales on the NPS and MAPS. For example, the NPS Supportiveness subscale was significantly associated with the MAPS Supportiveness and Warmth subscales while the NPS Hostility and Physical Control subscales were significantly associated with the MAPS Hostility and Physical Control subscales, respectively. Nighttime supportive practices were also associated with supportive emotion socialization behaviors on the part of parents (e.g., emotional validation and expression). Similarly, nighttime “negative” parenting behaviors (i.e., Hostility, Physical Control) were associated with unsupportive emotion socialization practices, such as emotion minimization. The additional subscales (i.e., Limit-setting, Media Monitoring, Co-Sleeping) were also related to conceptually similar subscales on the MAPS and CRSP. These results suggest that the NPS is tapping into theoretically similar constructs of parenting practices measured by other parenting scales with excellent psychometric properties, providing initial support for the convergent validity of the NPS.

Additionally, examinations of predictive validity were consistent with previous research demonstrating associations between parenting practices and youth sleep health (e.g., Bell & Belsky, 2008, Meijer, Reitz, & Dekovic, 2016, Acosta et al., 2021) as well as between parenting practices and child externalizing and internalizing pathology (e.g., Cummings, Davies, & Campbell, 2000, Rapee, 2012, Parent & Forehand, 2017). More specifically and consistent with our initial hypotheses, factors of the NPS reflecting “positive” parenting practices (e.g., supportive communication, quality time, limit-setting around bedtime routines) were positively associated with indices of sleep health in youth such as longer sleep duration, higher sleep efficiency, and sleep satisfaction. These positive practices were also negatively associated with sleep disturbances and sleep-related impairment. Although directionality cannot be assumed from the current study’s data, these results highlight parenting contexts within which youth’s sleep health may be optimized. For example, nighttime parent-youth interactions characterized by warmth, sensitivity, and supportive communication may cultivate evening family environments that facilitate longer and higher quality sleep as well as a greater ease to falling asleep in youth through calmer emotional states or a greater sense of safety and protection. Indeed, supportive parent-youth interactions in the evening may protect youth against vigilant states (e.g., attention to threat) known to disturb sleep onset and maintenance during the sensitive period of early adolescence (Ricketts et al., 2018). Additionally, in line with previous research (e.g., Gunn et al., 2019), our results further emphasize the benefit of parental limit-setting around youth’s bedtime routine (e.g., promoting a consistent

bedtime) on youth's sleep health, even as children grow older and transition to a more autonomous sleep context.

Alternatively, associations between “negative” nighttime parenting practices (e.g., yelling, parent-youth conflict, physical punishment) and indices of poorer sleep health in youth (e.g., higher sleep disturbances, worse sleep hygiene, lower sleep satisfaction, duration, and efficiency) demonstrated in the current study further lend support for how youth's sleep may be hampered by conflicted and coercive parent-youth nighttime interactions. Notably, when all factors of the NPS were entered as predictors of youth sleep health, Hostility and Physical Control were almost ubiquitously related to the various dimensions reflecting youth's sleep health (i.e., duration, efficiency, hygiene, disturbances, SRI) over and above “positive” or supportive nighttime parenting practices. These relations are likely reciprocal as difficulties related to sleep may precipitate a higher rate of “negative” nighttime parenting practices through higher levels of parenting stress and fatigue (Meltzer & Mindell, 2007). Importantly, this reciprocal relation may be further exacerbated by the increase in emotional and behavioral difficulties observed in youth with sleep problems (Gregory & Sadeh, 2021). Nevertheless, “negative” and unsupportive parenting practices have a detrimental influence on youth's sleep, particularly during peri-puberty (Acosta et al., 2021), highlighting the role of specific family processes on children's sleep health, perhaps through disruptions in emotion regulation or increases in vigilant attention (Taylor et al., 2004; Ricketts et al., 2018). Discerning directionality of causal influences among these relations is critical; still, the current cross-sectional results are consistent with previous findings and highlight the

need to consider nighttime parent-youth interactions as important sleep intervention targets for youth. In fact, addressing negative parent-youth dynamics at nighttime within the context of youth sleep interventions may be a low-stigma and untapped opportunity to assist with unsupportive family environments that not only perpetuate sleep problems, but other related mental health difficulties in youth.

Moreover, our findings demonstrated that Co-Sleeping Behaviors were associated with worse sleep hygiene and satisfaction as well as with higher sleep disturbances and SRI. Upon further examination, co-sleeping was also associated with bedtime worries and internalizing problems. In turn, it may be the case that poorer indices of youth sleep health through co-sleeping behaviors are related through higher levels of anxiety experienced by youth at bedtime. Indeed, when all factors were entered into the same regression model, only Co-Sleeping predicted child anxiety, results that are in agreement with previous research in this area (e.g., Palmer et al., 2018). These results highlight the need to ameliorate distressed emotional states at bedtime as important intervention targets for enhancing youth's sleep health, particularly during a sensitive developmental stage when the presence of sleep problems may initiate a negative cascade of internalizing distress in the form of anxiety and/or depression in adolescent youth (Alvaro, Roberts, & Harris, 2014). In this respect, assisting youth in reducing pre-sleep anxiety may also help support them in transitioning to a more autonomous sleep context with less need of parental involvement to attain the necessary self-soothing that sleep onset requires. Then, improvements in sleep may consequently lead to reductions in anxiety and/or depression given established links between sleep and internalizing symptoms (Kelly & El-Sheikh,

2013). Notwithstanding, in an effort to avoid the risk of over-imposing culturally constructed associations (e.g., co-sleeping with sleep problems) to families with diverse intersecting cultural identities, it is important to note that co-sleeping practices are inextricably bound with culture (Super & Harkness, 2013). As such, co-sleeping may merely reflect a normative behavior that isn't linked to youth's anxiety and/or emotional distress, but rather a customary practice that varies greatly across different cultural and ecological environments (Super & Harkness, 2013).

The current study is not without limitations. First and foremost, data was exclusively obtained through parent-report, which introduces the possibility of shared method variance. Future research should aim to address this limitation by collecting data via multiple informants (i.e., multiple caregivers, youth-report) and methods (i.e., observations, physiological data). Further, future investigations should also aim to validate a youth self-report version of the NPS scale to gain their perspective on nighttime parent-youth interactions and how these relate to their sleep. Second, due to the cross-sectional nature of the study, we cannot assume that parenting behaviors are causally associated with youth's sleep health indices; instead, they may influence one another in a reciprocal manner. Nevertheless, previous research has demonstrated parenting practices to longitudinally predict youth's sleep difficulties (Acosta et al., 2021). Moreover, the sample included in the present study was fairly homogenous, with the majority of participants identifying as White, non-Hispanic, married, and highly educated. Therefore, results may not generalize to a more heterogenous population. More research with diverse populations is needed to ascertain whether nighttime

parenting practices vary according to race, ethnicity, culture, socioeconomic status, etc. and how these differences may relate to indices of youth sleep health. Nevertheless, a significant strength of the current study included the validation of measurement invariance across youth sex and developmental stage, as well as across parental race, ethnicity, and education, suggesting that item responses and the underlying structure of the proposed measure appears consistent across these key demographic characteristics. Lastly, data was entirely collected during the Covid-19 pandemic; thus, results may not be generalizable given drastic changes in families' sleep and broader functioning due to highly stressful circumstances (e.g., financial insecurity, caregiving burden, illness; Prime & Wade, 2020). However, the pandemic might have amplified stressors in a way that gives us unique insight into the parenting effects reported here. As we transition into different facets of the pandemic and examine the sequelae of pandemic-related disruptions to the family system, future replicatory studies are warranted.

Additional strengths of the current study included, firstly, that the measure was designed and tested through four rigorous empirically-based stages. In addition, separate samples were used for each set of factor analyses, resulting in increased methodological rigor for item selection (Brown et al., 2006, Matsunaga et al., 2010). Secondly, the current study utilized advanced statistical methods for testing and evaluating the factor structure to be included in the final measure, establishing reliability metrics (e.g., omega coefficients with bootstrapped confidence intervals), and determining measurement invariance. Third, approximately one-third of our participants were fathers, a group that has been traditionally underrepresented in clinical child and family research (Parent et al.,



2017; Phares et al., 2005). Lastly, a significant strength of the current study is that our measure provides a new tool for assessing *nighttime* parenting, facilitating a novel framework that can inform both research and clinical endeavors focused on youth's sleep health within the family context.

In conclusion, the current study extended previous research by broadening the conceptualization of ecological models of children's sleep through examinations of the influence of distinct domains of nighttime parenting practices on youth's sleep health. Our results corroborate previous research linking parenting to children's sleep-wake behaviors and emphasize an untapped intervention target for enhancing youth's sleep health: addressing conflicting parent-youth interactions at nighttime. Indeed, our results have clinical implications and suggest that fostering positive nighttime parenting may be helpful in creating environments that are conducive to youth getting more and better-quality sleep. Doing so may be particularly relevant when addressing the health risks (e.g., anxiety, depression) posed by poor sleep health among youth. Importantly, promoting positive nighttime interactions between youth and their caregivers may represent a fruitful opportunity to transdiagnostically reduce sleep problems and co-occurring symptoms (e.g., heightened anxiety) through general improvements in family functioning. Overall, the support for nighttime parenting as a unique construct highlights a largely unexplored area of the literature with promising implications for clinical practice.

**Table 2.1.** Sociodemographic information for the present study sample.

| <b>Demographic Characteristic</b> | <b><i>M (SD) or %</i></b><br><i>N = 625</i> |
|-----------------------------------|---|
| Child Age                         | 11.59 (1.31)                                |
| Child Sex (% Female)              | 49.7  |
| Parent Gender (% Mothers)         | 67.9  |
| Parent Race/Ethnicity             |   |
| White                             | 67.4  |
| Black                             | 16.5  |
| Latinx                            | 13.1  |
| Asian                             | 9.6   |
| American Indian/Native Alaskan    | 3.2   |
| Pacific Islander                  | 0.6   |
| Other                             | 0.6   |
| Family Structure                  |   |
| Single                            | 9.3   |
| Married                           | 78.1  |
| Separated/Divorced                | 12  |
| Widowed                           | 0.3   |
| Family Income                     |   |
| Under \$20,000                    | 6.6   |
| \$20,000 - \$34,999               | 13.4  |
| \$35,000 - \$49,999               | 12.2  |
| \$50,000 - \$74,999               | 25.6  |
| \$75,000 - \$99,999               | 17.0  |
| Over \$100,000                    | 24.8  |
| Parent Education                  |   |
| Did not complete H.S              | 0.6   |
| H.S or GED                        | 8.3   |
| Some College                      | 22.9  |
| College Degree                    | 60.9  |
| More than College Degree          | 6.4   |

*Note:* H.S High School

**Table 2.2.** Factor loadings for the CFA model.

|   | SP  | HS  | PC  | LS  | MM   | CS  |
|---|-----|-----|-----|-----|------|-----|
| Item 7: Comfort my child  | .79 |     |     |     |      |     |
| Item 4: Listen to ideas and opinions                            | .78 |     |     |     |      |     |
| Item 2: Quality time  | .76 |     |     |     |      |     |
| Item 1: Express feelings  | .66 |     |     |     |      |     |
| Item 10: Talk about how day went                                | .70 |     |     |     |      |     |
| Item: 8: Laugh at night   | .69 |     |     |     |      |     |
| Item 23: Calm and focus on positive things                      | .61 |     |     |     |      |     |
| Item 21: Yell at bedtime  |     | .85 |     |     |      |     |
| Item 11: Argue with my child                                    |     | .82 |     |     |      |     |
| Item 15: Lose my temper   |     | .77 |     |     |      |     |
| Item 20: Conflict between my child and I                        |     | .73 |     |     |      |     |
| Item 3: Spank my child in the evening                           |     |     | .86 |     |      |     |
| Item 9: Physical punishment to discipline                       |     |     | .86 |     |      |     |
| Item 5: Spank when extremely angry                              |     |     | .84 |     |      |     |
| Item 12: Promote consistent bedtime                             |     |     |     | .85 |      |     |
| Item 18: Even if child whines and complains, consistent bedtime |     |     |     | .80 |      |     |
| Item 6: Clear expectations                                      |     |     |     | .53 |      |     |
| Item 22: Allow electronic devices school nights                 |     |     |     |     | .83  |     |
| Item 17: Limit screen time before bedtime                       |     |     |     |     | -.70 |     |
| Item 14: Monitor child's screen time                            |     |     |     |     | -.53 |     |
| Item 13: Let child sleep with me                                |     |     |     |     |      | .90 |
| Item 16: Lie next to my child until asleep                      |     |     |     |     |      | .49 |
| Item 19: Sleep with my child if they ask                        |     |     |     |     |      | .89 |

*SS* Supportiveness, *HS* Hostility, *PC* Physical Control, *LS* Limit-Setting, *MM* Media Monitoring, *CS* Co-Sleeping. See NPS appendix for full item content.

**Table 2.3.** Convergent validity of NPS factors with conceptually similar subscales.

| <b>Variable</b>                          | <b><i>r</i></b> |
|--|-----------------|
| <b><i>Nighttime Supportiveness</i></b>   |                 |
| Supportiveness (MAPS)                    | .62**           |
| Warmth (MAPS)                            | .57**           |
| Supportive ES (CCNES)                    | .57**           |
| Unsupportive ES (CCNES)                  | -.29**          |
| <b><i>Nighttime Hostility</i></b>        |                 |
| Hostility (MAPS)                         | .65*            |
| Unsupportive ES (CCNES)                  | .50**           |
| <b><i>Nighttime Physical Control</i></b> |                 |
| Physical Control (MAPS)                  | .82**           |
| Unsupportive ES (CCNES)                  | .50**           |
| <b><i>Nighttime Limit-Setting</i></b>    |                 |
| Proactive Parenting (MAPS)               | .48**           |
| Positive Reinforcement (MAPS)            | .37**           |
| Supportive ES (CCNES)                    | .44**           |
| Lax Control (MAPS)                       | -.40**          |
| <b><i>Nighttime Media Monitoring</i></b> |                 |
| Activities-Before Bedtime                | -.18**          |
| Electronic Use at Sleep Onset            | -.03            |
| <b><i>Co-Sleeping</i></b>                |                 |
| Sleep Location                           | .54**           |

\*\* $p < .01$ . ES = emotion socialization

MAPS = Multidimensional Assessment of Parenting Scale

CCNES = Coping with Children's Negative Emotions Scale – Adolescent Version

**Table 2.4.** Intercorrelations between NPS factors and relevant youth variables.

|                              | M (SD)      | 1      | 2      | 3      | 4      | 5     | 6      | 7      | 8      | 9      | 10     | 11     | 12     | 13    | 14 |
|------------------------------|-------------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|-------|----|
| <b>1. Supportiveness</b>     | 3.98 (.62)  | 1      |        |        |        |       |        |        |        |        |        |        |        |       |    |
| <b>2. Hostility</b>          | 1.93 (.76)  | -.33** | 1      |        |        |       |        |        |        |        |        |        |        |       |    |
| <b>3. Physical Control</b>   | 1.29 (.62)  | -.11** | .38**  | 1      |        |       |        |        |        |        |        |        |        |       |    |
| <b>4. Limit Setting</b>      | 4.21 (.74)  | .40**  | -.30** | -.17** | 1      |       |        |        |        |        |        |        |        |       |    |
| <b>5. MRB</b>                | 3.15 (.55)  | .30**  | -.05   | .04    | .31**  | 1     |        |        |        |        |        |        |        |       |    |
| <b>6. Co-Sleeping</b>        | 2.04 (.98)  | .16**  | .20**  | .26**  | -.17** | .08*  | 1      |        |        |        |        |        |        |       |    |
| <b>7. Sleep Hygiene</b>      | 2.17 (.48)  | -.004  | .26**  | .34**  | -.24** | .02   | .39**  | 1      |        |        |        |        |        |       |    |
| <b>8. Sleep Disturbances</b> | 1.74 (.47)  | -.17** | .47**  | .28**  | -.19** | -.002 | .21**  | .39**  | 1      |        |        |        |        |       |    |
| <b>9. Sleep Satisfaction</b> | 3.32 (.69)  | .17**  | -.26** | -.05   | .21**  | .11** | -.09** | -.13** | -.41** | 1      |        |        |        |       |    |
| <b>10. SRI/Alertness</b>     | 14.2 (5.7)  | -.23** | .47**  | .32**  | -.37** | -.04  | .20**  | .39**  | .46**  | -.29** | 1      |        |        |       |    |
| <b>11. Sleep Efficiency</b>  | 96.9 (2.5)  | .13**  | -.27** | .009   | .09*   | .03   | .07    | -.11   | -.47** | .46**  | -.24** | 1      |        |       |    |
| <b>12. Sleep Duration</b>    | 9:07 (0:57) | .11*   | -.14** | .006   | .16**  | .03   | .003   | -.14** | -.09*  | .16**  | -.16** | .38**  | 1      |       |    |
| <b>13. Internalizing</b>     | 7.69 (1.99) | -.10*  | .25**  | .18**  | -.08   | -.03  | .10*   | .21**  | .45**  | -.25** | .32**  | -.17** | -.12** | 1     |    |
| <b>14. Externalizing</b>     | 8.99 (2.73) | -.16** | .46**  | .27**  | -.09*  | .01   | .05    | .24**  | .38**  | -.22** | .33**  | -.17** | -.09*  | .44** | 1  |

*Note:* Intercorrelations are Pearson correlations, which are Point-Biserial correlations.

\* $p < .05$ . \*\* $p < .01$ . MRB = Media-Related Behaviors, SRI = Sleep-Related Impairment

**Table 2.5.** Unique predictive validity of NPS factors on relevant youth variables.

| <b>Variable</b>                        | <b>B</b>  | <b>95% CI</b>      |
|--|-----------|--------------------|
| <b><i>Sleep Duration</i></b>           |           |                    |
| Hostility                              | -572.979* | -1046.362, -85.542 |
| Limit-Setting                          | 679.339*  | 159.027, 1169.263  |
| <b><i>Sleep Hygiene</i></b>            |           |                    |
| Hostility                              | .062*     | .004, .119         |
| Physical Control                       | .157**    | .087, .229         |
| Limit-Setting                          | -.108*    | -.169, -.050       |
| Co-Sleeping                            | .131**    | .084, .182         |
| <b><i>Sleep Disturbances</i></b>       |           |                    |
| Hostility                              | .246**    | .188, .302         |
| Co-Sleeping                            | .055*     | .012, .091         |
| <b><i>Sleep Onset Latency</i></b>      |           |                    |
| Hostility                              | 4.103**   | 2.801, 5.444       |
| Physical Control                       | -1.624*   | -3.084, -.247      |
| Co-Sleeping                            | -1.108*   | -1.949, -.274      |
| <b><i>Sleep Efficiency</i></b>         |           |                    |
| Hostility                              | -1.094**  | -1.488, -.686      |
| Co-Sleeping                            | .321*     | .044, .565         |
| <b><i>Sleep Satisfaction</i></b>       |           |                    |
| Hostility                              | -.189*    | -.292, -.088       |
| Limit-Setting                          | .115*     | .019, .212         |
| <b><i>Sleep-Related Impairment</i></b> |           |                    |
| Hostility                              | 2.456**   | 1.742, 3.142       |
| Physical Control                       | 1.264*    | .405, 2.119        |
| Limit Setting                          | -1.994**  | -2.775, -1.234     |
| Media Monitoring                       | .847*     | .029, 1.590        |
| <b><i>Insomnia</i></b>                 |           |                    |
| Hostility                              | 1.968**   | 1.479, 2.435       |
| <b><i>Bedtime Worries</i></b>          |           |                    |
| Hostility                              | .676**    | .471, .875         |
| Co-Sleeping                            | .168*     | .043, .301         |
| <b><i>Anxiety</i></b>                  |           |                    |
| Hostility                              | 2.629**   | 1.917, 3.329       |
| Co-Sleeping                            | .521*     | .040, 1.078        |
| <b><i>Depressive Symptoms</i></b>      |           |                    |
| Hostility                              | 1.586**   | 1.026, 2.105       |
| Physical Control                       | .725*     | .090, 1.353        |
| <b><i>Externalizing Problems</i></b>   |           |                    |
| Hostility                              | 1.577**   | 1.265, 1.909       |
| Physical Control                       | .588*     | .166, .955         |

\* $p < .05$ . \*\* $p < .01$ .

## Supplemental Material

### The Nighttime Parenting Scale (NPS)

Parents have different ways of trying to raise their children and of interacting with their children. **Nighttime and bedtime** interactions between parents and their children might be different than daytime interactions. Please read each statement and rate how much each one best describes your parenting during the **2 hours that immediately precede your child's bedtime**. For example, if your child typically goes to bed at 10 pm, respond to each item thinking of your interactions with your child from 8 pm to 10 pm. Or, for example, if your child typically goes to bed at 8 pm, respond to each item thinking of your interactions with your child from 6pm to 8pm.

Please keep in mind that many items in the following questionnaire may be asking very *similar* questions. We kindly ask that, irrespective of the items' similarities, **ALL** items are carefully reviewed and answered according to how much each one describes your own parenting.

|   | Never | Almost<br>Never | Sometimes | Often | Always |
|---|-------|-----------------|-----------|-------|--------|
| 1. I encourage my child to express her/his feelings in the evening hours.   |       |                 |           |       |        |
| 2. I make sure I spend quality time with my child at the end of the day.  |       |                 |           |       |        |
| 3. I spank my child with my hand in the evening when she/he has done something wrong.   |       |                 |           |       |        |
| 4. I listen to my child's ideas and opinions in the evening   |       |                 |           |       |        |
| 5. I spank my child in the evening when I am extremely angry.   |       |                 |           |       |        |
| 6. I have clear expectations regarding my child's nighttime routine (e.g., dinner, bath time), which I communicate to my child.                     |       |                 |           |       |        |
| 7. If my child had a difficult day, I comfort my child at night.  |       |                 |           |       |        |
| 8. My child and I laugh often at night.   |       |                 |           |       |        |
| 9. I use physical punishment (for example, spanking) in the evening hours to discipline my child because other things I have tried have not worked. |       |                 |           |       |        |
| 10. I talk with my child in the evening about how his/her day went.   |       |                 |           |       |        |

In the following items, please indicate and rate how much each one best describes your parenting at your child's *bedtime* or when your child is going to bed or sleep.

Please keep in mind that many items in the following questionnaire may be asking very *similar* questions. We kindly ask that, irrespective of the items' similarities, **ALL** items are carefully reviewed and answered according to how much each one describes your own parenting

|   | Never | Almost<br>Never | Sometimes | Often | Always |
|---|-------|-----------------|-----------|-------|--------|
| 11. I argue with my child to get her/him to go to bed.  |       |                 |           |       |        |
| 12. I promote a consistent bedtime for my child during school nights.   |       |                 |           |       |        |
| 13. If my child doesn't want to sleep alone, I let her/him sleep with me.   |       |                 |           |       |        |
| 14. I monitor my child's screen time content before bedtime. (RC)   |       |                 |           |       |        |
| 15. I lose my temper at bedtime when my child doesn't do something I ask her/him to do (such as going to her/his bed to sleep). |       |                 |           |       |        |
| 16. I lie next to my child at night until she/he falls asleep.  |       |                 |           |       |        |
| 17. I limit my child's screen time before bedtime. (RC)   |       |                 |           |       |        |
| 18. Even if my child whines or complains, I make sure that she/he goes to sleep at a consistent time during school nights.      |       |                 |           |       |        |
| 19. I sleep with my child if he/she asks me to.   |       |                 |           |       |        |
| 20. Enforcing a nighttime routine results in conflict between my child and I.   |       |                 |           |       |        |
| 21. I have to yell to get my child to go to bed at night.   |       |                 |           |       |        |
| 22. My child is allowed to use electronic devices before going to bed on school nights.   |       |                 |           |       |        |
| 23. I help my child get calm and focus on positive things before going to sleep.  |       |                 |           |       |        |



## CHAPTER III

Family-based treatment for sleep problems in early adolescence: Outcomes, lessons learned, and clinical implications from a group intervention delivered via telehealth

## Abstract

Sleep problems in adolescence are pervasive and associated with physical, psychological, and functional impairment. Around the transition from childhood to adolescence (i.e., early adolescence; 9-14 years-old), sleep is vulnerable to disruption and disturbances have been shown to prospectively predict internalizing conditions (i.e., anxiety, depression). Youth's sleep health and habits are embedded within the family context and as such, are influenced by familial factors, with parenting practices being one of them. The current study evaluated pre- to post-treatment changes in youth sleep, mental health, and parenting practices following a family-based sleep intervention for teens delivered in group format via telehealth. Additionally, the feasibility, and acceptability of the intervention are discussed, including challenges encountered, lessons learned, and clinical implications. A total of six early adolescent participants (age  $M = 11.8$ ,  $SD = 2.1$ ) with a history of sleep problems and anxiety, and their parents (83% mothers), participated in the intervention from February to March of 2021. Youth and parents reported on youth's sleep and mental health, as well as on parents' nighttime and general parenting practices at pre- and post-treatment assessments. Results revealed general within-subject improvements in youth's sleep and mental health. Nighttime and general parenting practices at post-treatment also trended in favorable directions. The preliminary findings from the current open trial lend support for the involvement of parents as active participants in sleep interventions for young adolescents. Doing so may support efforts to address the pervasiveness and gravity of poor sleep health during the sensitive developmental stage of early adolescence.

## **Introduction**

### **Sleep and Mental Health Difficulties in Early Adolescence**

Sleep problems in adolescence are pervasive and pose a serious threat to youth's physical and mental health, academic success, and safety (American Academy of Pediatrics, 2014; American Academy of Sleep Medicine, 2010; Owens, 2014). Approximately 70% of adolescents report sleep problems in the United States (National Sleep Foundation, 2014), and rates are concerningly higher (i.e., 85%) in youth with internalizing presentations (i.e., anxious, depressive symptoms, McMakin & Alfano, 2015). To add to this concern, there are established sleep disparities between White and racial and ethnic minority children and adolescents, with minoritized youth (i.e., Hispanic, Black) having shorter sleep duration, poorer sleep quality, and more delayed sleep onset (Guglielmo et al., 2018, Combs et al., 2016).

Increasing evidence supports the consideration of early adolescence (i.e., 9-14 years-old) as a developmental stage that is particularly sensitive to the effects of poor sleep on youth's emotional and behavioral health (McMakin & Alfano 2015; Blake et al., 2017; Kelly & El-Sheikh, 2014). During the transition from late childhood to early adolescence, youth experience a shift in physiological susceptibilities towards a more evening-type circadian phase preference, resulting in a biological-driven delay in sleep onset (Carskadon Vieira & Acebo, 1993). Additionally, maturational changes in youth's sleep homeostasis around this developmental stage result in a slower rate of sleep pressure or homeostatic drive, and thus, a physiologically-driven later sleep timing in young adolescents (Jenni, Acherman & Carskadon, 2005). Said delay in sleep onset is compounded by socio-contextual factors unique to the adolescent period (e.g., afterschool

employment, diminished parental monitoring around bedtime, increased media use, earlier school start times), ultimately shortening youth's sleep opportunity and placing them at higher risk for mental health difficulties. Indeed, when experienced during early adolescence, sleep problems have been shown to longitudinally predict, and thus, be a driver of internalizing difficulties to a greater extent than the reverse (Kelly & El-Sheikh, 2013; Quach, Nguyen, & Williams, 2018). Alternatively, a robust relation between sleep problems and externalizing difficulties (e.g., conduct problems, hyperactivity, inattention) has been established as bidirectional.

### **Parenting and Youth Sleep Problems**

Pediatric sleep health should be considered within the familial context. Given the limited control of their immediate environment, youth's sleep health may be influenced by dynamic family processes (e.g., caffeine consumption, family conflict, screen time monitoring) to a greater extent than adults (Meltzer, Williamson, & Mindell, 2021; El-Sheikh & Kelly, 2017). Parenting practices is one among the many familial influences on children's sleep (e.g., Acosta et al., 2021). For example, "positive" parenting practices (e.g., warmth, supportiveness, limit-setting, monitoring) have been previously linked to more optimal sleep health (e.g., longer sleep duration in youth, less daytime sleepiness) while "negative" parenting practices (e.g., hostility, physical discipline, laxness) have been linked to poorer sleep indices (e.g., inconsistent sleep schedules, lower sleep duration) in youth (e.g., Acosta et al., 2021; Meltzer & Mindell, 2007; Meijer, Reitz, & Dekovic, 2016). In early adolescent youth, a more pronounced relationship between negative parenting practices and youth's sleep problems has been documented, suggesting that the detrimental impact of negative nighttime parenting practices on

youth's sleep health outweighs the benefits of positive nighttime parenting practices during this developmental stage (Acosta et al., 2021).

Additionally, emergent research by our team provided evidence for a novel conceptual framework on early adolescent youth's sleep health within evening or nighttime family environments (Acosta et al., under review). Specifically, we examined the relationship between nighttime (i.e., within the 2 hours preceding youth's bedtime and during night's sleep) parenting practices (as opposed to general/daytime practices) and youth's sleep health. Consistent with the aforementioned literature, our investigation yielded a positive relationship between "positive" nighttime parenting practices (i.e., supportiveness, limit-setting around bedtimes, media monitoring) and better indices of youth's sleep health (e.g., longer sleep duration, higher sleep efficiency, higher sleep satisfaction). Conversely, "negative" nighttime parenting practices (i.e., hostility, physical discipline, permissiveness related to media use and bedtime schedule) were associated with indices reflecting worse sleep health in youth (e.g., higher sleep disturbances, worse sleep hygiene, lower sleep duration). Notably, nighttime parenting practices related to various domains encompassing youth's sleep health (e.g., duration, onset latency, efficiency, satisfaction) over and above the impact of general or daytime parenting practices (e.g., general warmth expressed throughout the day). These results lend support for clinically addressing nighttime parenting practices as a potential mechanism to ameliorate sleep problems in youth.

### **Gaps within Intervention Research Addressing Sleep Problems in Adolescence**

Adolescent sleep intervention research has traditionally focused on school-based psychoeducational programs (as discussed in Blake et al., 2016). Although these

interventions reach a large audience, they primarily increase sleep knowledge rather than effectuate improvements in youth's sleep and mental health (e.g., Blunden, Chapman, Rigney, 2012; Rigney et al., 2015). In contrast, targeted and active sleep interventions appear to precipitate meaningful improvements in adolescent's sleep and related mental health difficulties by modifying sleep-interfering patterns of thinking and behavior (e.g., McMakin et al., 2019; Blake et al., 2016; Blake et al., 2018).

Existing sleep interventions have primarily involved parents via provision of session material and/or sleep education to instill enforcement measures (e.g., parent-set bedtimes; Short et al., 2011; Bonnar et al., 2014). Parental involvement in adolescent sleep intervention has yielded mixed evidence with it either offering promise (e.g., by setting limits around bedtimes; Short et al., 2011) or conferring no benefits to improvements in youth's sleep (e.g., Bonnar et al., 2014). Notably, although the differential influence of positive and negative parenting practices on youth's sleep health has been repeatedly documented, parenting practices have yet to be incorporated and/or intervened on in clinical practice within adolescent sleep interventions (Khor et al., 2021). Concerningly, when involved by, for example, instilling bedtime rules, parents may lack the tools to effectively foster sleep-promoting behavioral changes in youth, which may inadvertently incite family conflict and, ironically, exacerbate youth's problems with sleep (Allison, 2000; Khor et al., 2021). Further, parenting practices or strategies at bedtime or nighttime may be uniquely challenged by competing priorities, fatigue, and mood changes, which may in turn precipitate or exacerbate family conflict and ultimately contribute to the maintenance of sleep problems in youth. Additionally, there is evidence that parenting practices in a specific context are a more powerful

predictor of youth behavior in the same context (e.g., Sanders et al., 2016), which suggests that addressing nighttime parenting practices may be of particular relevance to the reduction of sleep problems in youth. This proposition is corroborated by the aforementioned research linking nighttime parenting practices to youth's sleep health above and beyond the impact of general/daytime practices.

Altogether, empirical evidence lends support for empowering parents with well-established strategies that are tailored to effectively promoting healthy sleep habits in their children. Considering that youth have less control over their sleep practices and environment (Melzer, Williamson & Mindell, 2021), addressing the influence of youth's socio-ecological system on their sleep by targeting nighttime parenting practices may enhance already-promising treatment outcomes of cognitive-behavioral sleep interventions for adolescents. Given that reductions in pre-sleep arousal has been identified as an important mechanism for the therapeutic improvement of sleep problems among at-risk adolescents (with symptoms of anxiety and depression; Blake et al., 2016), offering parenting tools that are strategically implemented at nighttime may reduce conflict and improve physiological states for sleeping, which may in turn assist youth in modifying sleep-interfering cognitions and behaviors and thereby learn how to manage their sleep more independently. The development of a family-based sleep intervention for at-risk early adolescent youth presenting with co-occurring sleep problems and internalizing difficulties was informed by the presented gaps in adolescent sleep intervention research and the empirical evidence linking parenting practices to youth's sleep health. Additionally, the consideration of early adolescence as a period that is particularly sensitive for disturbed sleep was primordial from the inception of FABSleep.

The presented gaps in adolescent sleep intervention research as well as the empirical evidence linking parenting practices to youth's sleep health and the consideration of early adolescence as a period that is particularly sensitive for disturbed sleep informed the development of a family-based sleep intervention for at-risk early adolescent youth presenting with co-occurring sleep problems and internalizing difficulties.

### **Family-Based Sleep Intervention for Young Teens: Conceptual Model and Empirical Roots**

The Family-Based Sleep Intervention for Teens (FABSleep) primarily targets early adolescent youth's sleep not only to enhance it, but as a transdiagnostic treatment target for deterring negative mental health trajectories from escalating in adolescence. The FABSleep's protocol builds on established treatment principles for both sleep problems, and family-based treatment of externalizing and internalizing mental health difficulties. Specifically, the intervention is composed of youth- and parent-focused protocols. The program Sleeping TIGERS (McMakin et al., 2019) was used to guide the youth-focused protocol. Derived from cognitive and behavioral theories and conceptual models on vigilant attention to threat (e.g., Spielman, Saskin, & Thorpy, 1987; Dahl, 1996; Ricketts et al., 2018), Sleeping TIGERS leverages a motivational framework to modify *perpetuating* mechanisms that contribute to the development and maintenance of sleep difficulties. These mechanisms are targeted by encouraging sleep-promoting cognitions, emotions, behaviors, and in doing so, correcting maladaptive sleep habits (e.g., long afternoon naps) known to sustain sleep problems.



The parent-focused protocol was derived from social learning and ecological systems theories, applied concepts of behavior modification, and conceptual models on youth's sleep within the family context (Reitman & McMahon, 2013; Bronfenbrenner, 1992; Patterson, 2005; Meltzer, Williamson, & Mindell, 2021; Acosta et al., 2021; Acosta et al., under review). Similar to traditional behavioral parent training (BPT) interventions (e.g., McMahon & Forehand, 2003), the parent-focused protocol entails the systematic modification of the social and nighttime home environment in order to foster ecological contexts at the microsystem level where youth's sleep may be more likely to thrive. This protocol views sleep problems as a phenomenon partly sustained by conflict within nighttime parent-youth interactions, which may arise or intensify cognitive-emotional arousal and thereby disrupt youth's sleep health (Acosta et al., 2021). Our conceptual model, supported by our emergent research findings (Acosta et al., under review), posits that nighttime parenting may be a unique construct and different than general and/or daytime parenting due to contextual factors that characterize the evening timeframe. As previously mentioned, competing demands and fatigue in the nighttime hours may uniquely challenge and/or lessen parents' emotional resources to deal with challenging youth behaviors, ultimately precipitating or exacerbating family conflict. Said familial conflict, theoretically, may heighten nighttime emotionally vigilant states or physiological arousal, which directly oppose the necessary low-arousal, safe emotional environment needed for sleeping well and sufficiently by interfering with self-soothing and/or sleep-inducing processes, and subsequently disrupting youth's sleep (Dahl, 1996; Ricketts et al., 2018). Maladaptive vigilant attention to threat at bedtime is of particular relevance to the treatment of sleep problems in youth with internalizing symptoms (i.e.,

anxiety, depression) given this population's greater vulnerability to experience an attentional bias to anxiety-related threat (Dudeny et al., 2015), a state that has been shown to interfere with sleep onset and maintenance (Ricketts et al., 2018). Importantly, a secondary goal of the parent-focused protocol was to promote a positive spillover such that improved nighttime parenting generalizes to practices throughout the day, ultimately improving the quality of the parent-youth relationship, which can then be leveraged to create positive changes in youth's sleep and mental health (See Figure 1 for conceptual model).

### **The Current Study**

The current study utilized data from an open trial which included 6 participants and their parents to evaluate the initial utility, feasibility, and acceptability of FABSleep. We examined changes in youth's sleep and mental health as well as in nighttime and general parenting practices from pre- to post-treatment following participation in FABSleep, which was delivered in English, in group format and via telehealth from February to March of 2021. We hypothesized that there would be pre- to post-treatment improvements in targeted sleep health domains (i.e., disturbances, efficiency, sleep onset latency, bedtime worries). Additionally, we hypothesized pre- to post-treatment within-subject improvements in internalizing symptoms including anxiety and depression. Lastly, we hypothesized pre- to post-treatment within-subject increases in nighttime positive parenting practices (i.e., supportiveness, limit-setting, media monitoring) and decreases in nighttime negative practices (i.e., hostility, physical control). Given the small sample size, our primary goal included discussing the utility, feasibility, and acceptability of the intervention to guide future research and provide clinical suggestions

that may help address the pervasiveness and gravity of poor sleep health during the sensitive developmental stage of early adolescence.

## **Method**

### **Participants.**

Six early adolescent youth (2 males, 4 females) and their parents (1 father, 6 mothers) participated in the current study. Most youth experienced clinically elevated sleep problems (83% T-score > 60 at pre-treatment on youth-reported PROMIS Sleep Disturbances). Additionally, youths were predominantly anxious (100% T-score > 60 at pre-treatment on youth-reported PROMIS Anxiety). The sample was primarily Hispanic (66.7%). Half (50%) of the parents reported having a college degree and having a household income of below \$35,000. See Table 3.2 for the sample's sociodemographic characteristics.

### **Therapists and Supervisor**

The therapists were three doctoral graduate students, including the first author who was the leading therapist and provided peer supervision. The lead therapist had 3-years and 5-years of experience delivering evidence-based pediatric behavioral sleep interventions and parent-based interventions, (i.e., Parent-Child Interaction Therapy, Incredible Years; Shuhmann et al., 1998; Webster-Stratton et al., 2003), respectively. The other two therapists had a strong background in cognitive-behavioral therapy for children and adolescents. Therapists were trained by the lead therapist during a 3-hour training, which included didactics and role-play. However, training was ongoing during both weekly peer group supervision and clinic group supervision with a licensed pediatric clinical psychologist (supervisor DM). Additionally, live peer supervision was also

provided as the lead therapist conducted the treatment sessions jointly with the other two therapists.

The supervisor was a licensed child/adolescent clinical psychologist with more than a decade of clinical and research experience in treating pediatric sleep problems and internalizing conditions. The supervisor co-authored the Sleeping TIGERS manual. She conducted weekly group supervision with the three therapists, during which she provided all therapists with hands-on training on the methodology for assessment and treatment of pediatric sleep problems and related internalizing comorbidities. Additionally, she conducted supervision with the lead therapist to monitor the swift implementation of the intervention, therapists' psychotherapy skill acquisition, and lead therapist's supervisory practices and approaches.

### **Procedure**

With approval from the University's Institutional Review Board, youth 9 to 14 years of age and their parents were recruited in a local children's hospital where the supervisor works, and the therapists were practicum students. Participants were recruited from the waitlist within the Department of Psychology, via internal referrals and via flyers distributed within the children's hospital. The current study leveraged an already-existing and ongoing community group intervention for youth presenting with sleep problems at the supervisor's clinic. As such, other than experiencing sleep problems and being between the ages 9 to 14, no additional study eligibility criteria were enforced. Parents and youth completed pre- and post-treatment assessment surveys. Youth participants were provided with a sleep tracking device (i.e., Fitbit) throughout the intervention timeframe. FABSleep was delivered in group format, and via telehealth

given Covid-19-related social-distancing hospital guidelines. Additionally, although most parents identified as Hispanic, all of them spoke English fluently and thus both the youth- and parent-focused protocols were delivered in English. Nevertheless, parents were provided with the option to receive the intervention in Spanish. However, all parents identified English as their preferred language. The intervention took place in February to March of 2021. Youth and parent sessions were primarily conducted separately, yet simultaneously, with joint check-in and check-out discussion and/or skill practice. Per hospital procedures, each participant had an individual intake appointment with the supervisor and lead therapist to discuss their sleep and mental health concerns and evaluate their clinical fit with FABSleep. Families were paid a total of \$60 for completing weekly and pre- and post-assessment surveys. Of note, one participant requested to be seen individually by the lead therapist following the first group treatment session given concerns related to sharing private information. The lead therapist delivered FABSleep to said participant and their mother in an individual format. Data on this patient was not included in group statistical analyses.

## **Measures**

*Youth and parent sleep.* Parents and youth reported on youth's sleep via parent proxy and self-report versions of the Children's Report of Sleep Patterns (CRSP; Meltzer, et al., 2013) and of the Patient-Reported Outcomes Measurement Information System (PROMIS) Pediatric Sleep-Related-Impairment (Forrest et al., 2018) at the pre- and post-assessment waves. Additionally, some (i.e., 3) youth wore a sleep tracking device (i.e., Fitbit) intermittently throughout the duration of the intervention. Seven dimensions (i.e., sleep-related behaviors, alertness or daytime sleepiness, timing, efficiency, and duration)

encompassing pediatric sleep health (Buysse, 2014; Meltzer et al., 2021) were calculated based on data from the CRSP. Specifically, the CRSP includes a Daytime Sleepiness subscale. Further, an item inquiring about how consistently youth go to bed at night at the same time was examined to reflect timing. Additionally, data (i.e., bedtimes, wake times, sleep onset latency) from the CRSP Sleep Patterns subscale (e.g., bedtimes, wake times, sleep onset latency) was used to estimate nighttime sleep duration and efficiency. Nighttime sleep duration was calculated by subtracting estimated sleep onset latency and night waking duration from sleep opportunity (i.e., bedtime to waketime) while sleep efficiency was calculated by dividing estimated nighttime sleep duration by sleep opportunity. Data from the CRSP Sleep Hygiene (e.g., caffeine use, sleep location, electronic use at sleep onset), and Sleep Disturbance (e.g., bedtime fears, insomnia, parasomnia) subscales was used to evaluate sleep-related behaviors. For these subscales, higher scores indicated worse sleep hygiene or greater sleep disturbances. The CRSP has been demonstrated to be a reliable and valid measure of pediatric sleep health (Meltzer et al., 2013).

***Youth mental health.*** Parents and youth reported on youth's mental health via parent proxy and self-report versions of the PROMIS Pediatric Anxiety and Depressive Symptoms (Varni et al., 2012). Strong psychometric properties have been demonstrated for both scales (Varni et al., 2012). The Brief Problem Monitor (BPM; Achenbach et al., 2011) was used to assess externalizing behavioral and attention difficulties. This 19-item scale, derived from the Child Behavior Checklist and Youth Self-Report has been demonstrated to have excellent reliability, validity, and internal consistency (Achenbach

et al., 2011). All mental health measures were completed at the pre- and post-treatment assessment waves.

***Parenting practices.*** Parents and youth completed a preliminary version (prior to scale validation) of the Nighttime Parenting Scale (NPS; Acosta et al., under review). The NPS is composed of six subscales: Supportiveness, Hostility, Physical Control, Limit-Setting, Media-Monitoring, and Co-Sleeping. Parents also reported on their general/daytime positive (i.e., proactive parenting, positive reinforcement, supportiveness, warmth) and negative parenting practices (i.e., hostility, physical control, laxness) through the Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2017). Additionally, parents completed the Coping with Children's Negative Emotions Scale – Adolescent Version (CCNES-A; Fabes, Eisenberg, & Bernzweig, 1990) to assess their supportive (i.e., expressive encouragement, problem-focused and emotional-focused reactions) and unsupportive reactions (i.e., distress, minimization, and punitive) to their children's negative emotions. Strong psychometric properties have been established for both the MAPS (Parent & Forehand, 2017) and CCNES (Fabes et al., 2002). All parenting measures were completed at the pre- and post-treatment assessment waves.

***Fidelity.*** Treatment fidelity was assessed via a therapist-report 3-point Likert rating scale (1 – not covered; 2 – covered but minimally adequate; 3 – covered well) on each session's main components. Jointly, all three therapists completed fidelity checklists immediately following each treatment session. Fidelity was measured separately for youth-focused sessions, parent-focused sessions, and youth and parent joint discussion/practices.

*Acceptability of FABSleep.* Although not included in the initial research protocol, following the termination of the intervention, the lead therapist contacted each family to inquire about the acceptability and perceived challenges and benefits of FABSleep. At this time, the lead therapist also met with each therapist independently to inquire about their experiences when delivering the intervention.

### **Analytic Plan**

Analyses were conducted using SPSS 27. There was no missing data at the pre- and post-treatment assessment waves. Given the small sample size, effect sizes and indicators of clinically significant change were used to evaluate change across sleep, mental health, and parenting practices from pre- to post-treatment. Specifically, to correct for bias in small samples, we calculated effect sizes via the Hedges *g* formula (Hedges, 1981) to describe within-subject change (0.20 - 0.49 small; 0.50 - 0.79 medium, and >.80 large). Additionally, we utilized the Reliable Change Index (RCI; Jacobson & Truax, 1991) as an indicator of clinically significant change. RCI values greater than  $\pm 1.96$  suggested that the magnitude of change attributable to treatment was statistically reliable. Lastly, paired samples *t*-tests were used as an ancillary measure of within-subject change.

## **Results, Discussion, and Clinical Implications**

### **Feasibility**

*Recruitment.* Despite the high prevalence of sleep problems among youth with physical and mental health difficulties, recruiting families to participate in FABSleep was rather difficult. Connections with neurology and primary care within the children's hospital were made to create a steady flow of referrals. However, no referrals were made within these connections. Overall, five out of the six participants were recruited via the



Psychology waitlist and one via an internal departmental referral. A lack of referral flow via connections with neurology and primary care could be partly explained by decreased interactions among psychology and these departments due to remote work and social distancing guidelines at the time of recruitment. Other reasons may include physicians balancing a multitude of responsibilities, limited sleep problems screening, lack of report of sleep problems by parents and youth to providers, and a lack follow-through or warm hand-off in the case that families were provided with the intervention flyer outside of the Department of Psychology. These barriers advocate, both at the provider and consumer level, the potential benefit of integrating a behavioral specialist within primary care setting to not only relieve physician's responsibilities to appropriately address youth's sleep health, but also to establish sleep problems screening procedures and a related steady stream of referrals to Psychology. As an example, anecdotally, the supervisor established a "Sleep Clinic" with a pediatric neurologist specialized in sleep disorders, during which the supervisor was consulted to address behavioral aspects of youth's sleep problems via brief behavioral interventions and, importantly, when appropriate, conceptualize youth's sleep problems within a psychological umbrella. This model allowed for interdisciplinary knowledge sharing and collaboration as well as fostered a more comprehensive evaluation and intervention of pediatric sleep problems, and importantly, when warranted, it paved the way to make appropriate referrals.

Notably, although the number of families seeking psychological services at the current children's hospital tends to be in the one hundreds, at the time of FABSleep recruitment, only a few families reported sleep problems as their main concern on the waitlist. Interestingly, one of the most prevalent concerns reported within the Psychology

Department is anxiety, a condition that is partially characterized by disturbed sleep, which means that, consistent with the previous literature, approximately 80% of the youth in the waitlist may have experienced sleep problems at the time of recruitment. Given these factors, it appears that families may not have conceptualized sleep problems as a psychological concern that could have benefited from behavioral intervention. Additionally, conditions such as anxiety and depression may have been more noticeable or concerning to caregivers, and thus, may have precipitated help-seeking behaviors to a greater extent than for sleep problems. Concerningly, limited knowledge on developmental sleep milestones and on socio-contextual and biological shifts in sleep disruption vulnerability, compounded by society's celebration of the deprioritization of sleep ("*I'll sleep when I'm dead*") and the "normalization" of poor sleep among adolescents, both youth and their parents may not even conceive sleep problems as needing behavioral intervention in the first place. To add to this concern, a limited understanding or perception on what constitutes adequate sleep health may further widen the sleep health disparity gap between low-income, minoritized (e.g., Hispanic) youth and their higher-income white counterparts (Guglielmo et al., 2018, Combs et al., 2016). These dilemmas call for action around widespread sleep education, particularly within the context of disturbed sleep initiating or exacerbating a cascade of mental health difficulties in at-risk youth.

***Participant retention and engagement.*** Although recruitment was challenging, retaining participants in treatment was not a concern. The five parent-youth dyads that participated in the group intervention attended every session. The one participant and her mother who requested to be seen individually, also attended all six weekly individual

sessions. Parents were observed to be engaged in sessions, provided one another with support, and completed all study surveys. Nevertheless, some engagement difficulties were reported by the therapist that co-led the parenting group noting *“delivering the intervention via telehealth was hard because parents were cooking and doing other stuff during the session timeframe. Of course, telehealth allows for more access to services, but some parents didn’t treat it as a “doctor’s” appointment”*. One parent had a similar perception stating *“it was a loss that it was online. I felt it would have been more effective in person because we would have had more interactions between parents and children with the support of a therapist”*. Further, youth were observed to engage in discussion and session practices; however, the delivery of the intervention via telehealth may have also interfered with engagement. Indeed, the therapist that co-led the parenting group noted that *“the wide range of ages made it hard to equally engage youth, particularly as these were anxious teens who frequently didn’t turn on their cameras during sessions”*.

Full retention of participants may have been associated with the short length of the intervention (i.e, 6 weeks), making the commitment less daunting. The presumed advantage of retaining participants via brief interventions is notable given a consistent documentation of high attrition rates within the context of parenting interventions (up to approximately 60%; Tully & Hunt, 2017) with even higher rates in low-income, minoritized families (up to 75%; e.g., Rothenberg et al., 2019; Jent et al., 2021). Although the current sample is too small to generalize our interpretations, briefer interventions may alleviate family’s demands and thereby enhance engagement, particularly for low-income, racially, and culturally diverse families who face significant barriers (e.g., transportation, difficulty navigating healthcare systems) to accessing and

remaining engaged in evidence-based services (Derr, 2016; Alegria et al., 2010; Abe-Kim et al., 2007). The lack of attrition in the current study is congruent with previous studies on brief parenting interventions documenting lower attrition rates (i.e., from 9 to 27%; Tully & Hunt, 2015).

The aforementioned conclusions are purely speculative. Perhaps, high retention in our study may have been primarily linked to families' motivation to enhance youth's sleep health and/or families potentially finding the intervention beneficial. Additionally, although the telehealth delivery of the intervention may have impacted in-session engagement, it may have also facilitated consistent attendance given the ease of attending sessions, a factor that is consistent with evidence on families reporting fewer barriers to accessing care when participating in internet-delivered interventions (e.g., Comer et al., 2017; Sullivan et al., 2021). Also, as observed during the delivery of FABSleep, delivering the intervention in a group format may have fostered peer support and knowledge sharing, which may have potentially increased buy-in and session engagement. This type of support may have been particularly beneficial during the time when the intervention took place, given added stressors brought about by the pandemic (Prime, Wade, & Browne, 2020).

Lastly, consistent use of Fitbit devices by youth throughout the intervention was poor. Specifically, only one participant wore it for most of the 6-weeks of treatment. Two participants only had data for 1 day while the other two wore it for a total, but intermittent amount of two weeks. Although it was initially assumed that youth wearing a mainstream tracker device would be almost effortless, the data on the limited usage of it by most participants says otherwise. Relatedly, one parent noted that "*maybe at the*

*beginning my son was excited to wear it. Overtime, he lost interest on it, and he found it uncomfortable so he wouldn't wear it".* Perhaps, other participants may have found the Fitbit uncomfortable too. Additionally, they may have simply forgotten to wear it. To address these challenges, conducting weekly calls outside of treatment to inquire about Fitbit usage and collaboratively problem-solving around barriers to wearing it could have increased its use among the current sample. Alternatively, to decrease staff burden, automatizing text messages reminders to youth and parents could have also supported a more consistent use of the device. Considering these challenges, effective and creative solutions to the use of wearable sleep tracker devices that can objectively measure changes in youth's sleep should be prioritized prior to the initiation of a sleep intervention research protocol. Doing so may be particularly important as the use of wearable devices has been linked to increased awareness of sleep habits (e.g., Liang & Ploderer, 2016), and thus may motivate youth to engage in sleep-promoting behaviors to attain "better" sleep indices. For example, the parent of the participant who wore the Fitbit throughout the intervention noted "*having the Fitbit really motivated my daughter to keep working on her sleep health. She would send us screenshots of her sleep data. It helped her be consistent with her sleep-wake schedule*".

***Intervention implementation.*** FABSleep is a brief intervention, which includes content that is "*easily digestible*" to both families and therapists in training (per acceptability answers). Indeed, the delivery of the intervention via telehealth was "smooth", as reported by therapists. The ease of assigning "breakout rooms" within the same meeting facilitated a smooth transition from check-in to the separate delivery of the youth- and parent-focused protocols, and subsequently, to the joint portion of the sessions

at check-out. FABSleep can be delivered via group and individual format (i.e., 20 minutes with youth, 20 minutes with parent, 20 minutes with both parent and youth). When delivered in group format, a minimum of two therapists are needed in order to facilitate the simultaneous delivery of the youth- and parent-focused protocols. In linguistically diverse communities like the South Florida one, an additional therapist may be needed to deliver the intervention in parents' preferred (or only) language (e.g., Spanish). Thus, to respond to the ethnic diversity with respect to the predominant local ethnic tradition, the parent-focused protocol of FABSleep was developed in both English and Spanish. However, the number of therapists needed to deliver FABSleep may dampen the enthusiasm to implement the intervention given staff shortage and/or cost-effectiveness concerns. Yet, the shortness of the intervention may alleviate these concerns, particularly when delivered in group format to service multiple families simultaneously.

***Treatment Fidelity.*** For the youth-focused protocol, fidelity ranged from 66% to 100% across sessions, with an overall average of 90%. For the parent-focused protocol, fidelity ranged from 83% to 100% across sessions, with an overall average of 96%. Lastly, for the joint parent-youth portion of the sessions, fidelity ranged from 66% to 88%, with an overall average of 76%. See fidelity rates for each portion of all six group treatment sessions on Table 3.1.

As depicted in Table 3.1, fidelity ratings for the joint parent-youth portion of the sessions were generally the lowest compared to the youth- and parent-focused protocols, illuminating how, indirectly, collaboration among youths and their parents may have been de-emphasized throughout treatment. Given that the joint portion of sessions

typically occurred at the end, time constraints may have impacted therapists' ability to comprehensively deliver the parent-youth protocol. Additionally, delivering the intervention via telehealth may have also inherently precluded opportunities for effective parent-youth collaboration with therapist support. Indeed, the lead therapist and supervisor had the experience of delivering FABSleep once in person (prior to the initiation of the current study), during which seemingly collaborative parent-youth interactions supported by therapists took place. Perhaps, adding one or two more sessions to FABSleep's protocol may increase the opportunity for collaborative practices. Or, for institutions that do not bill insurance, having 90-minute sessions may also allow for more time to engage in collaborative planning, communication, and skill practice among youth, their parents, and the therapists.

### **Acceptability**

*Parent impressions.* Overall, parents reported acceptability and enthusiasm about the intervention, with one parent noting they “walked away with a much better understanding of healthy sleep habits and of the importance of sleep for our overall functioning” and another parent stating “I gained insight as to the type of behaviors that aren't conducive to getting good sleep, especially since my husband suffers from sleep problems himself. So, the group actually gave him good tips as to how to improve his own sleep.” Further, regarding the parent-focused protocol, a parent noted “it was critical for parents to be involved in treatment” and another parent reported “I found the parenting tips particularly helpful such as the importance of being positive before bedtime and improving our relationship with our children. Tips such as “don't leave praise for perfection” or have special one-on-one time with your children were really helpful. All

*parenting tips made me think that when I was a kid, I didn't have the best family environment or relationships with my parents and my sleep was bad. So maybe, improving my relationships with my parents would have helped me sleep better."* Other statements by parents included *"group taught me the importance of calming our emotions before bed instead of doing or watching something too exciting that won't let us sleep"* and *"we learned the importance of not addressing particularly stressful topics right before bedtime. For example, my husband used to do homework and point out to my daughter how she wasn't doing well in school before bedtime. I'm sure that didn't help her with her sleep, so now we know to address those subjects at different times. We know now that arguing before bedtime is not the best"*.

***Therapist impressions.*** The therapist that co-led the parenting group stated that *"making the intervention a bit longer could have provided more opportunity to address parents' unique concerns"*. However, she noted that *"the group format allowed for parents' feelings to be validated by one another. Parents were in similar positions, and it was helpful for parents to receive peer support"*. Further, she reported *"the content of sessions was easily digestible for families"*. Additionally, the therapist that led the youth group reported that she *"enjoyed delivering the intervention"* and that she now incorporates brief sleep interventions in most of her cases, noting *"I didn't realize how high the prevalence of sleep problems is among my cases. Now, I mindfully ask about sleep to all my clients and address their sleep concerns through the strategies I learned in group"*.

***Acceptability Discussion.*** As described above, parents reported high acceptability of the intervention, noting that their involvement in it was *"crucial"*. However, questions



about FABSleep's acceptability were posed by the lead therapist, which likely could have positively biased parents' and therapists' responses about FABSleep. For these reasons, statements by both parents and therapists should be "taken with a grain of salt". Nevertheless, consistent attendance, participation, and completion of surveys could be more objective indicators of families perceiving a benefit to remaining engaged in treatment. Similarly, the intervention seemed to be well accepted by therapists in training, suggesting that the content was "easily digestible" when delivering the intervention, and importantly, highly applicable to other cases. Although the enthusiasm about FABSleep may dampen due to the number of therapists needed to deliver it, as exemplified in the current manuscript, the delivery of FABSleep in group-format may provide co-therapy opportunities from which mental health providers in training can easily learn evidence-based strategies for improving youth's sleep. The ramification of that, as highlighted in the acceptability interview with therapists, can result in the addition of sleep behavioral intervention practices in mental health providers' clinical toolbox. This is important given evidence on pediatric health care clinicians lacking knowledge on sleep health and medicine (Meltzer et al., 2021), which may result in therapist underutilization of evidence-based sleep-enhancing strategies within the context of psychotherapy, and ultimately, in a persistence of sleep problems in youth (e.g., McMakin et al., 2019)

### **Utility**

*Evidence for effects on youth sleep health.* There were large effect sizes on from pre- to post-treatment on youth-reported sleep efficiency (Hedge's  $g = -1.26$ ) as well as a very large effects size in the reduction of sleep onset latency (Hedge's  $g = 1.61$ ), electronics use at bedtime (Hedge's  $g = 1.07$ ) and worries at bedtime (Hedge's  $g = 1.13$ ),

all based on CRSP descriptive data. All of these domains achieved a reliable change from pre- to post-treatment ( $RCI > 1.96$ ) and statistical significance in within-subject changes (all  $p < .05$ ; see Table 4 for paired-sample  $t$ -tests results). Additionally, there were large effect sizes in within-subject changes from pre- to post-treatment on youth-reported sleep disturbances (Hedge's  $g = .904$ ) and sleep duration (Hedge's  $g = -.843$ ) on the CRSP (all  $RCI > \pm 1.96$ ). Additionally, there was a medium effect size in within-subject changes from pre- to post-treatment on youth-reported sleep satisfaction on the CRSP (Hedges  $g = -.659$ ), PROMIS sleep-related impairment (Hedges  $g = -.659$ ), bedtime consistency on the CRSP (Hedges  $g = .685$ ), and sleep hygiene on the CRSP (Hedges  $g = .703$ ). However, none of these four sleep health domains achieved a reliable change (all  $RCIs < \pm 1.96$ ). Additionally, Figure 2 depicts pre- to post-treatment mean differences for each participant across all domains of sleep health: *Satisfaction*, *Alertness/Daytime Sleepiness*, *Timing (consistency in bedtime)*, *Efficiency*, and *Duration*. Figure 2 also includes pre- to post-treatment differences on an overall sleep disturbances index. As depicted in the graphs, there were general improvements in most domains. However, two participants (i.e., 3 and 4) had an increase in sleep disturbances and one participant (i.e., 4) had a reduced sleep duration at post-treatment. Additionally, 2 participants (i.e., 1 and 3) reported an increase in sleep-related daytime impairment at post-treatment.

Moreover, there were large effect sizes from pre- to post-treatment on parent-reported increased sleep satisfaction (Hedge's  $g = -1.88$ ), decreased sleep disturbances (Hedge's  $g = -1.09$ ), and improved Sleep Hygiene (Hedge's  $g = .959$ ), based on the CRSP. These two domains achieved a reliable change from pre- to post-treatment ( $RCI > 1.96$ ) as well as significant within-subject differences ( $p < .05$ ). Further, there were medium

effect sizes on parent-reported youth PROMIS sleep-related impairment (Hedge's  $g = .56$ ), CRSP bedtime consistency (Hedge's  $g = .596$ ), CRSP sleep efficiency (Hedge's  $g = -.666$ ), CRSP sleep duration (Hedge's  $g = -.581$ ), and CRSP electronics use at bedtime (Hedge's  $g = .596$ ). See Table 3.3 for all youth- and parent-reported sleep health outcomes.

***Evidence for effects on youth mental health.*** There were large effect sizes from pre- to post-treatment on youth-reported anxiety (Hedge's  $g = 1.22$ ) and depressive symptoms (Hedge's  $g = 1.46$ ), based on the PROMIS measures. These conditions achieved a reliable change from pre- to post-treatment ( $RCI > 1.96$ ) and statistical significance in within-subject changes (all  $p < .05$ ). More specifically, 66% ( $n = 4$ ) of the entire sample showed clinical improvement ( $RCI > 1.96$ ) in their anxiety (see Figure 3a), while 83% showed clinical improvement ( $RCI > 1.96$ ) in their depressive symptoms (see Figure 3b). Further, there was also a large effect on youth-reported attention problems (Hedge's  $g = 1.46$ ), yet it did not achieve a reliable change ( $RCIs < \pm 1.96$ ). More specifically, 50% of youth reported reduced attention problems, one youth reported no change, and two (33%) youths reported increased attention problems (see Figure 3c). Regarding externalizing problems, 66% reported reductions while 33% reported increases (see Figure 3d).

Similarly, there were large effect sizes from pre- to post-treatment on parent-reported anxiety (Hedge's  $g = .874$ ) and depressive symptoms (Hedge's  $g = .80$ ), based on the parent-proxy PROMIS measures. Specifically, 66% of parents reported decreases in their children's anxiety, while the remaining 33% reported no change. Regarding depressive symptoms, 83% of parents reported reductions in their children's depressive symptoms

while one parent reported increases. Further, there was also a large effect size on parent-reported attention problems (Hedge's  $g = 1.32$ ), based on the BPM. Lastly, there was a medium effect size on parent-reported externalizing problems (Hedge's  $g = .772$ ), based on the BPM. More specifically, 100% and 66% of parents reported decreases in their children's attention problems and externalizing problems, respectively. All parent-reported mental health outcomes achieved a reliable change (RCIs  $< \pm 1.96$ ). See Table 3.4 for all youth- and parent-reported mental health outcomes.

*Evidence for effects on parenting practices.* There was a medium effect size from pre- to post-treatment on youth-reported nighttime limit-setting (Hedge's  $g = .551$ ). Youth-reported nighttime parental limit setting decreased from pre- to post-treatment. There was also a medium effect size on reductions in youth-reported nighttime co-sleeping (Hedge's  $g = .211$ ) from pre- to post-treatment. Based on parent report, there were medium effect sizes on nighttime supportiveness (Hedge's  $g = -.724$ ), general/daytime positive parenting practices (Hedge's  $g = -.678$ ), and general/daytime negative parenting practices (Hedge's  $g = .501$ ). More specifically, 83% of parents reported increases in nighttime supportiveness and in general/daytime positive parenting practices. 83% also reported decreases in general/daytime negative parenting practices. Lastly, there were small effect sizes on reductions in parent-reported nighttime hostility (Hedge's  $g = .416$ ) and physical control (Hedge's  $g = .377$ ). More specifically, 83% of parents reported decreases in nighttime hostility. Unexpectedly, there was a small effect size for increases in unsupportive emotion socialization practices (Hedge's  $g = -.478$ ), with only one parent reporting decreased unsupportive practices. Small effect sizes were also found for increases in parent-reported nighttime limit-setting (Hedge's  $g = -.461$ ).

83% of parents reported increases in nighttime limit-setting, one parent reported no change, and another parent reported a slight decrease in nighttime limit-setting. Figure 4 and Table 3.5 depict pre- to post-treatment mean differences for each parent participant across nighttime and general/daytime parenting domains, respectively.

**Utility Discussion – Sleep Health.** Consistent with previous sleep intervention research (e.g., McMakin et al., 2019; Blake et al., 2016; Blake et al., 2018), there were *medium* to *large* effect sizes on within-subject changes in almost *all* sleep health dimensions from pre- to post-treatment. However, as depicted in Figure 2, 33% of the sample exhibited slightly increased daytime sleepiness and sleep disturbances at post-treatment. Speculatively, these results may reflect a greater awareness of problems with sleep and related impairment and/or of what constitutes adequate sleep health. Indeed, research on adolescent sleep problems incidence has documented a subjective underestimation of self-identified sleep problems despite evidence of clinical indicators of disturbed sleep (Short et al., 2013). As such, via the intervention, increased awareness of the detrimental impact of poor sleep may have precipitated worries or rumination about sleep (e.g., “*I’m having a hard time falling asleep, so I won’t get enough sleep tonight to focus on my test tomorrow*”), an experience that has been commonly documented in poor sleepers (Hiller et al., 2015). Alternatively, given the narrow timeframe of the intervention, these unexpected increases in sleepiness and sleep disturbances may have signaled environmental stress (e.g., spike in Covid-19 cases, upcoming Florida testing in schools). Nevertheless, both youth- and parent-reported sleep health outcomes were primarily favorable, which is notable given the brevity of treatment

and the limitations in treatment personalization due the group format delivery of the intervention.

Within-subject improvements in many domains encompassing youth's sleep health following a group intervention boosts the enthusiasm for the dissemination of brief, targeted sleep interventions to promote population-level health gains, particularly during sensitive developmental periods, which can be capitalized to prevent mental health difficulties (McMakin & Alfano, 2015). To maximize their public health potential, the delivery of evidence-based sleep-promoting practices may be crucial to reduce the sleep health disparity suffered by low-income, racially, and ethnically diverse families (Guglielmo et al., 2018, Combs et al., 2016). However, as previously mentioned, a concerning large number of pediatric health care clinicians lack knowledge about developmentally appropriate sleep milestones, socio-contextual and biological shifts in sleep disruption vulnerability, and most importantly, about how to treat pediatric sleep problems via evidence-based practices (Meltzer et al., 2021). Moreover, even if pediatric providers have sleep intervention knowledge, recommendations such as "*do not let your children use their smartphones before bedtime*" or "*make sure that your child goes has a regular sleep-wake schedule*" often lack the provision of helpful parenting strategies to *actually* follow through with said recommendations. Ironically, without tools at their disposal, sleep-related enforcement measures by parents may create additional parent-youth conflict that can maintain or exacerbate youth's sleep problems. Precisely for these reasons, including parents as active participants in targeted sleep interventions, even as children grow older, may be particularly beneficial to enhance youth's sleep health. Although the uncontrolled open trial nature of the current study doesn't allow for

identifying the mechanisms underlying improvements in the current sample's sleep health, increases of medium effect sizes in nighttime supportiveness and general/daytime positive practices may have contributed to the sleep health outcomes. Certainly, to avoid “the wheel of being reinvented”, a future randomized-control trial (RCT) comparing the youth-focused intervention to FABSleep may answer questions related to the level of ancillary benefit of actively involving parents in sleep interventions for adolescents.

Furthermore, consistent with previous research on adolescent sleep (e.g., Short et al., 2013) there were discrepancies among youth and parent reports of youth's sleep problems, which may be associated with parents' increasingly reduced awareness of their children's sleep patterns as they grow older. For example, there was a large effect size in youth-reported reductions in bedtime worries from pre- to post-treatment, compared to a small effect size reported by parents. Clearly, worrying at sleep onset is a more internal phenomenon that parents may be unaware of, and that adolescents, in particular, may be less prone to disclose. Alternatively, sleep-related behaviors such as bedtime regularity and daytime sleepiness may be more observable behaviors to parents, which may lead to more congruent perceptions. Perceptual discrepancies on what constitutes poor sleep health are relevant as they may result in underutilization of sleep interventions due to parents being uninformed about the severity or even the presence of their children's sleep problems. Consistent with the aforementioned recommendations, a potential avenue to circumvent this issue may be to systematically inquire about children's sleep during physical and mental health visits, which may in turn send a message to families about the importance of having good sleep health (Meltzer et al., 2021). Importantly, the integration of sleep problems screening within primary care and mental health settings

may foster the provision appropriate referrals, and thereby encourage families to take care of their sleep.

***Utility Discussion – Mental Health.*** Remarkably, there were large effect sizes on changes from pre- to post-treatment youth- and parent-reported anxiety and depression, with 66% and 83% of the sample reporting reliable clinical improvement in youth-reported anxiety and depressive symptoms, respectively. These results are notable as the current youth sample was a predominantly anxious one (100% had a T-score above 60 at pre-treatment on PROMIS Anxiety) and because the intervention did not specifically target anxiety and depression. Improvements in anxiety and depressive symptoms were corroborated by parents' report. Similarly, there were large effect sizes on decreased youth- and parent-reported attention problems. Parents also reported a medium effect size on decreased externalizing problems. These improvements in indices of mental health are congruent with past studies documenting decreased anxiety and depression symptomatology following cognitive-behavioral and mindfulness-based sleep interventions (e.g., Blake et al, 2016; Bei et al., 2013). However, sleep intervention studies have reported small effect sizes on reductions in mental health difficulties. Although we cannot discern the mechanism leading to mental health improvements in the current study, perhaps, the family-based nature of the intervention may have contributed to these large effects via increased positivity and/or presumed decreased conflict within parent-youth interactions, consistent with an abundance of robust evidence on parenting programs leading to reductions in externalizing and internalizing difficulties (Higa-McMillan et al., 2011).



Improvements in anxiety are noteworthy given several past studies revealing that anxious youth's problems with sleep revolve primarily around onset and maintenance due to a vigilant and/or cognitively (e.g., rumination) and somatically (e.g., muscular tension) aroused pre-sleep states, partly attributed to underdeveloped self-regulatory/soothing skills (Dahl, 1996; Ricketts et al., 2018; Alfano et al., 2013. Forbes et al., 2008; Alfano et al., 2010). For these reasons, FABSleep intentionally targeted youth's emotional state at the pre-sleep period via sleep-promoting bedtime practices (e.g., winding-down, savoring) and, presumably, via more positive nighttime parent-youth interactions and/or parent supportive behaviors (e.g., rewarding, praising) to youth's implementation of learned skills. These findings fit within the framework of hyperarousal models of insomnia (Riemann et al., 2010), and highlight the clinical importance of addressing psychological and physiological arousal at bedtime to not only improve the quality of sleep (Blake et al., 2017), but to decrease general anxiety among at-risk youth. The conceptual model underlying FABSleep is consistent with this recommendation as it aims to foster a safe and calm family environment within which youth's sleep's health may be optimized. Importantly, these results also call attention to the need to systematically incorporate a sleep enhancement component (e.g., savoring at bedtime) to cognitive-behavioral interventions for anxious youth (e.g., McMakin et al., 2019).

It is important to contextualize youth's mental health improvements within the context of the pandemic when families, and adolescent youth in particular, may have felt isolated and lonely. Perhaps, improvements in mental health may have been also linked to increased socialization, intimacy, and support via participation in a group intervention with similarly aged peers who experienced similar psychological distress. Very possibly,

feeling understood, listened to, and emotionally validated, independent from the implementation of treatment skills, could have yielded such remarkable improvements in anxiety, depression, and externalizing difficulties. A future RCT may answer questions related to disentangling the mechanisms underlying improvements in mental health following a sleep intervention. Nevertheless, the current findings suggest that delivering a brief behavioral group sleep intervention may assist in the transdiagnostic amelioration of sleep and mental health difficulties during highly stressful and unprecedented times when youth's psychological distress may intensify (Gassman-Pines et al., 2020). Additionally, these findings also support FABSleep's implementation as a brief and targeted triage opportunity to address the high number of youths awaiting psychological services for months.

***Utility Discussion – Parenting Practices.*** As hypothesized, per parents' report, there were general increases in positive nighttime practices (i.e., supportiveness, limit-setting) and general/daytime positive parenting practices as well as general decreases in parent-reported nighttime negative practices (i.e., hostility, physical control). Youth's report; however, did not corroborate these findings. Indeed, youth reported a slight decrease in their parents' nighttime supportiveness, limit-setting, and media monitoring. Poor concordance among youth- and parent-reported parenting practices is not uncommon (e.g., Taber, 2010) and, in the current study, may have been partially related to social desirability biases on the part of parents, parents' "emotional" investment into the intervention and desire to perceive positive self-changes, and/or youth simply not noticing changes in their parents' parenting practices. Alternatively, or additionally, differences in perceived parenting practices may reveal underlying conflict within the

parent-youth relationship. Indeed, adolescents' subjective perceptions of parenting practices has been shown to relate to the quality of the parent-youth relationship and to adolescents' well-being (e.g., Bosco et al., 2003; Paulson & Sputa, 1996). For example, adolescents' perception of their parents as supportive, affectionate, and emotionally available have been associated with more positive youth behavioral and emotional well-being (Bosco et al., 2003). Such evidence highlights the importance of incorporating both youth- and parent-report measures of parenting practices both in research and clinical settings as differences in perceived parents' behaviors may contribute to increased parent-youth relational conflict. Incorporating coded observations of parenting behaviors during parent-interactions may also be warranted in future trials. To address this discordance and perhaps through more parent-youth collaborative in-session practices, families receiving FABSleep would have benefited from greater emphasis on how newly-learned sleep strategies can be supported or reinforced through positive parenting practices, which may have in turn created a more congruent insight on adaptive parenting behaviors among youth and their parents.

Furthermore, although the effect sizes for within-subject changes in parenting practices ranged from small to medium (and all RCIs were insignificant), they are consistent with the larger parenting intervention literature (e.g., Compas et al., 2009; Forehand et al., 2012; Chu et al., 2015; Florean et al., 2020; Fluja-Contreras, Garcia-Palacios, & Gomez, 2019) and noteworthy given the limited treatment personalization and the shortness and format (i.e., group and via telehealth) of the intervention. The smaller effect sizes are unsurprising given the following reasons: First, when it comes to nighttime parenting practices, the measured used was a preliminary version of the

validated and finalized scale of the NPS (Acosta et al., under review). In turn, this version may not have reliably captured the domains that encompass *nighttime* parenting. Second, FABSleep is a shorter intervention (~1.5 months), compared to well-established parenting interventions (~ 3 months) known to effectuate changes in parenting practices (e.g., Parent-Child Interaction Therapy, Eyberg & Funderbunk, 2011; Helping the Noncompliant Child, McMahon & Forehand, 2003), which are typically intensive interventions that foster skill acquisition through live coaching and daily at-home practice. Third, when compared to parenting interventions for young children, literature on pre- to post-treatment effect sizes for older children and/or adolescents following parenting interventions documents effect sizes of smaller magnitude (e.g., Leijten, Overbeek, & Janssens, 2012; Chu et al., 2015; Florean et al., 2020). Notably, the trends on parent-reported increased positive nighttime and general practices and decreased negative nighttime and general practices following a 6-week, group intervention is exciting as many established parenting interventions are traditionally “long” and intensive and are known to have high attrition rates, particularly in low-income, and racially and culturally diverse families (e.g., Lanier et al., 2011; McCabe & Yeh 2009; Questch et al., 2020). Despite our small sample, all families, which were predominantly Hispanic and of a low socioeconomic background, participated in FABSleep from beginning to end (even the family who chose an individual format). Although it cannot be concluded, the short timeframe or, as previously mentioned, the telehealth delivery of the intervention may have assisted in retaining families throughout the entire duration of the intervention via reduced barriers. As such, even if the parenting effects sizes were smaller to medium in magnitude, the current preliminary findings suggest that a brief parenting

intervention focused on supporting youth's sleep health may foster improved parent-youth nighttime interactions with a presumed spillover effect on adaptive general/daytime parenting practices, and a possibly improved family milieu. From a clinical perspective, the discussion of addressing negative parent-youth dynamics within the context of a sleep intervention almost provided a low-stigma opportunity to create parental insight on possibly unsupportive or conflicted family environments that may have sustained youth's sleep and mental health difficulties. This seemingly greater awareness is corroborated by the qualitative comments by parents emphasizing the importance of a calm and positive family environment at nighttime to foster higher quality and more sleep.

Lastly, similarly to our interpretations on the current youth mental health findings, it is vital to contextualize the presumed "improvements" in parent-reported parenting practices findings within the context of a pandemic when parents were navigating ongoing unprecedented and highly stressful uncertainties and, very possibly, high levels of psychological distress (Patrick et al., 2020). Although we didn't assess for parents' psychological well-being, it is likely that all families were in one way or another impacted by the pandemic, which may have increased family conflict, and diminished parents' emotional resources to effectively engage in skill practice or handle "difficult" youth behavior. Similarly to youth, receiving peer parental support via empathy, understanding, and advice from others with alike familial experiences may have also contributed to a motivation to engage in the discussed parenting practices and/or strategies.

***Limitations and Strengths.*** The findings previously discussed should be interpreted within the study's limitations. First, the sample was *very* small and so the

findings may not be generalizable. Future replicatory studies with a larger sample of youth and parent dyads is warranted. Second, due to the open trial design, the causal influence of the intervention cannot be concluded, and thus, improvements in sleep and mental health could have been attributed to alternative factors other than the intervention. A future RCT could answer these questions. Third, data was entirely collected during the Covid-19 pandemic, which again, may limit the findings' generalizability given the uniquely and acutely stressful timeframe during which the intervention was delivered. Fourth, the lack of objective sleep data measured by Fitbits limit the enthusiasm of the current findings given our inability to corroborate subjective improvements in sleep. Future research should emphasize planning around difficulties with sleep tracker usage among youth.

Despite the small sample and related cautious interpretations of the results, the current study's sample was primarily Hispanic and of lower socioeconomic background, which is notable given the underrepresentation of this population in the literature and sleep health disparities among Hispanic and non-Hispanic whites (Williams et al., 2015; Loreda et al., 2010). Additionally, most data, including nighttime parenting practices, was collected *both* via youth and parent reports, allowing for different perspectives to be explored, and for said differences to be clinically interpreted in meaningful ways. Further, the intervention was accepted by both therapists in training and families, suggesting that the content was "easily digestible" and applicable. Additionally, the current research addressed an understudied question on the influence of parenting practices on adolescent youth's sleep health. Indeed, associations among parenting practices and children's sleep have primarily been studied during infancy and early

childhood (El-Sheikh & Kelly, 2017). In turn, the current study corroborates previous empirical data (e.g., Acosta et al., under review) and adds to the conceptualization of early adolescent youth's sleep health within the family context.

### **Conclusion**

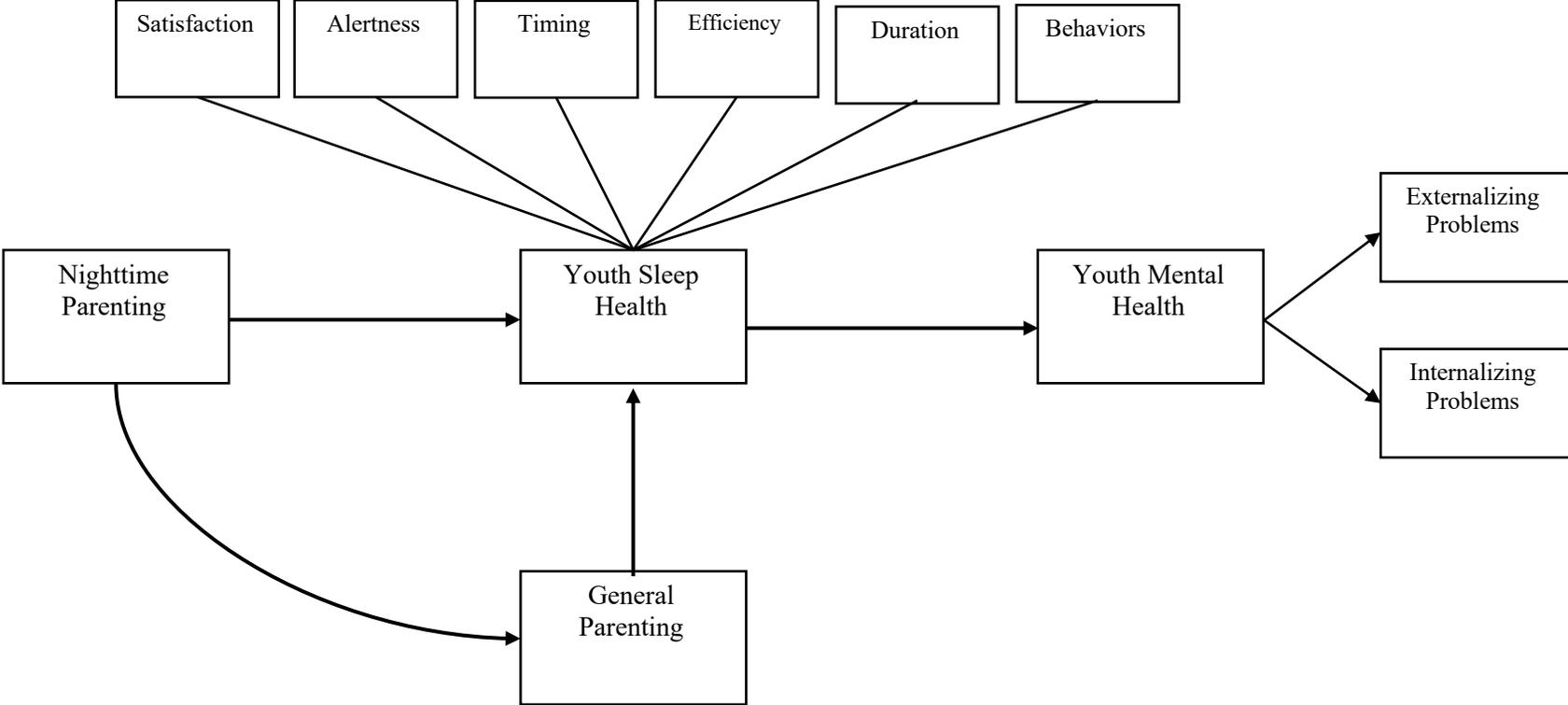
The current manuscript described the conceptual model and implementation of a family-based intervention for peri-pubertal youth with sleep problems. The current study utilized data from 6 participants and their parents and provided preliminary support for the utility, feasibility, and acceptability of FABSleep. FABSleep was derived primarily from an evolving understanding of familial and/or parent-youth relational ecosystems as *perpetuating* mechanisms that increase or cause sleep problems and commonly co-occurring mental health difficulties in youth (e.g., Acosta et al., 2021, Meltzer, Williamson, & Mindell, 2021, El-Sheikh & Kelly, 2017). As such, FABSleep aimed to target sleep and mental health difficulties not only via well-established cognitive-behavioral sleep-promoting strategies adapted for youth with comorbid anxiety (McMakin et al., 2019), but also via increases in supportive and adaptive parenting practices, so that the presumably strengthened parent-youth relationship could be leveraged to create positive sleep and mental health changes in youth. Given that sleep during early adolescence is prone to malfunction and problems with it around this developmental stage prospectively increase the risk of internalizing distress (i.e., anxiety, depression; McMakin & Alfano 2015; Blake et al., 2016; Kelly & El-Sheikh, 2014), FABSleep specifically addressed sleep problems during this *sensitive* developmental period as a transdiagnostic approach towards reducing and/or, ideally, *preventing* mental health difficulties later in adolescence.

Interestingly, FABSleep's goal to enhance youth's sleep health partly via enhanced positive practices provided a low-stigma and seemingly innocuous opportunity to gain and promote insight on families' microcosm and potentially maladaptive dynamics that may have sustained family conflict and related youth's sleep and mental health difficulties. Furthermore, the findings from the current study provided preliminary support for the use of sleep enhancement as a transdiagnostic target for improving sleep health, with potential to deter negative mental health trajectories and improve overall family functioning, while simultaneously screening for mental health difficulties that may warrant a higher level of care. Prospective associations between sleep problems and internalizing difficulties, as well as evidence that targeting anxiety does not fully resolve sleep problems (McMakin, et al., 2019) further emphasize the need for sleep intervention dissemination.

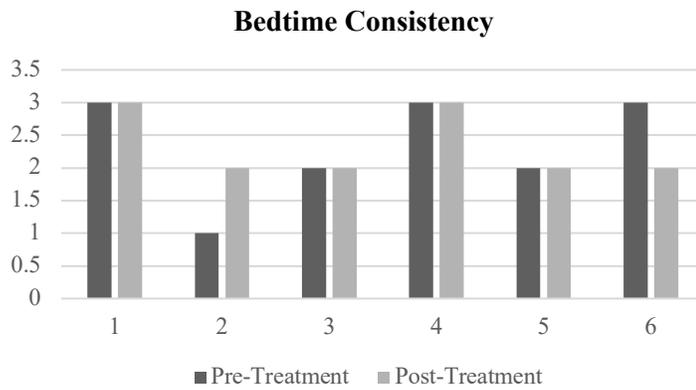
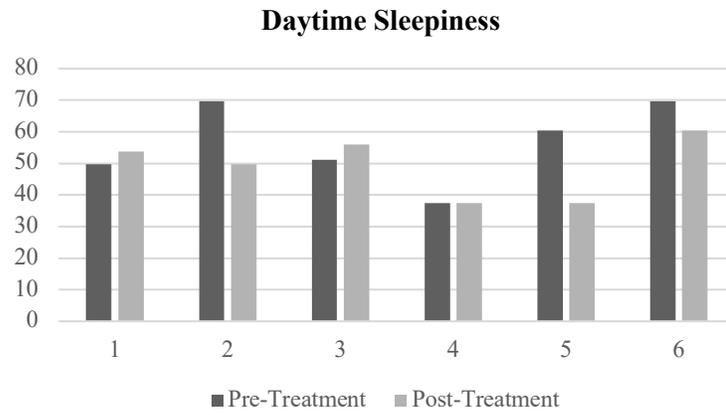
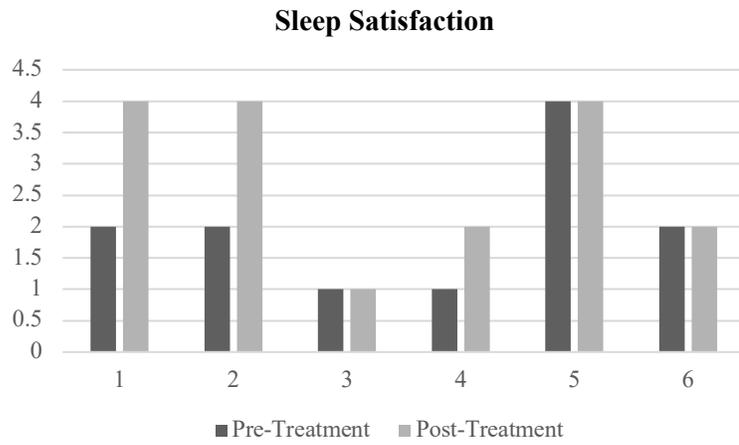
All in all, the current study lends further support for parenting practices as contributors to youth's sleep health (e.g., Acosta et al., 2021). The lesson learned via our clinical experiences and supported by empirical data is that parents' active involvement in their children's treatment may be of key importance in order to create ecological immediate environments that support healthy sleep and good mental health. Capitalizing on *sensitive* developmental periods such as early adolescence to enhance youth's sleep health may prove fruitful in ameliorating the mental health crisis that intimately affect both families and providers. In other words, let's join forces and help youth sleep better and longer as the benefits may be astounding.



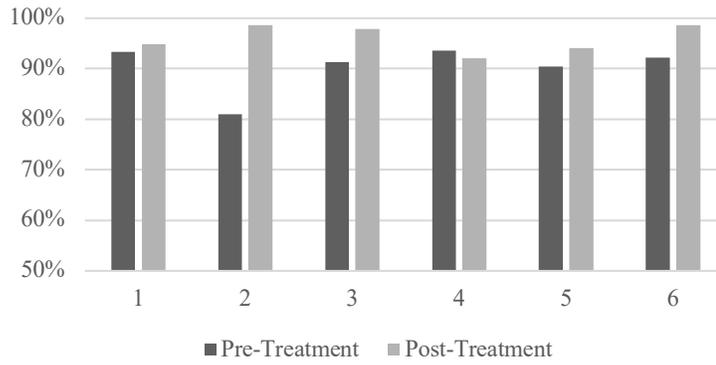
**Figure 1.** Family-Based Sleep Intervention for Teens - Conceptual Model



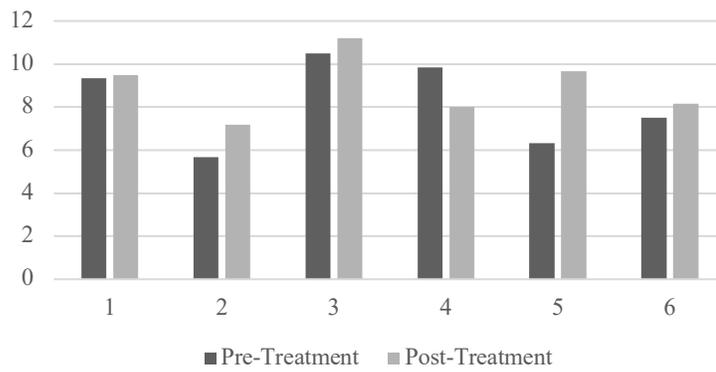
**Figure 2.** Pre- to post-treatment self-report differences on youth’s sleep health domains.



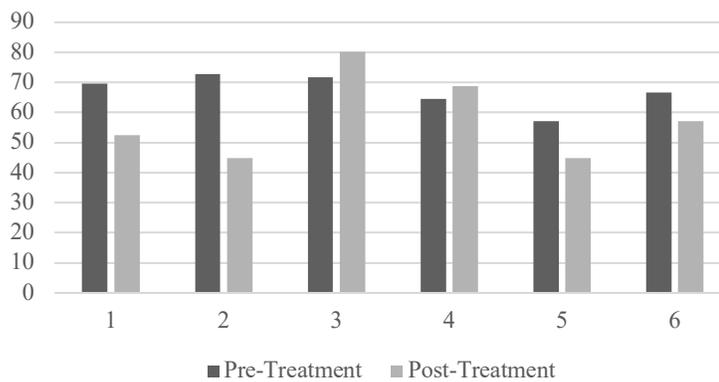
### Sleep Efficiency



### CRSP Sleep Duration



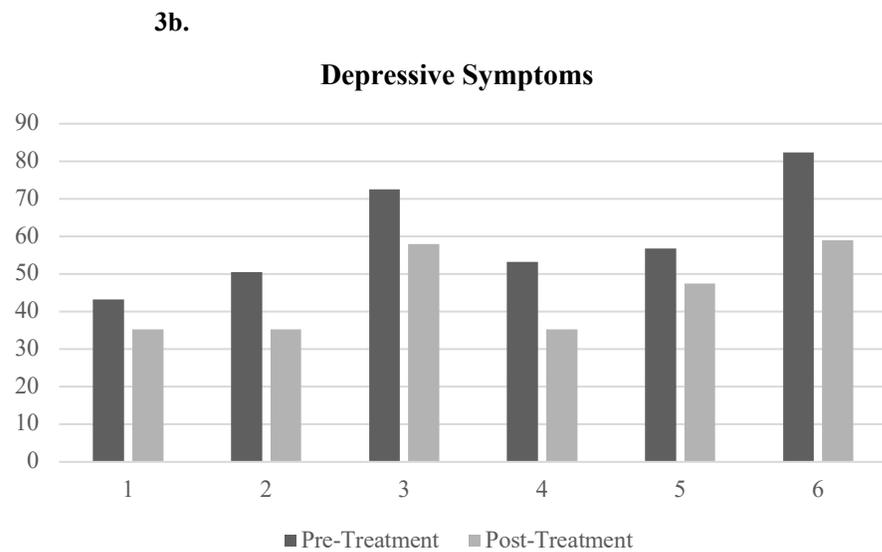
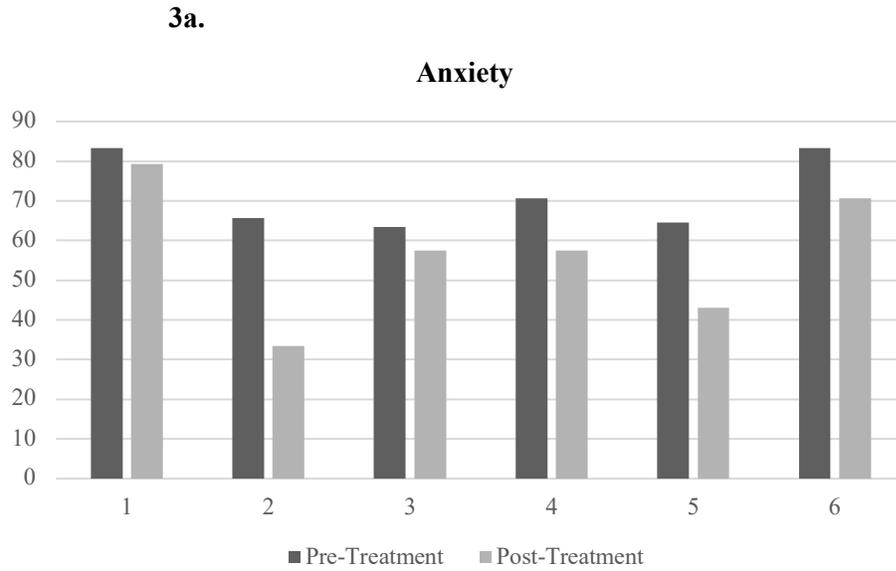
### PROMIS Sleep Disturbances



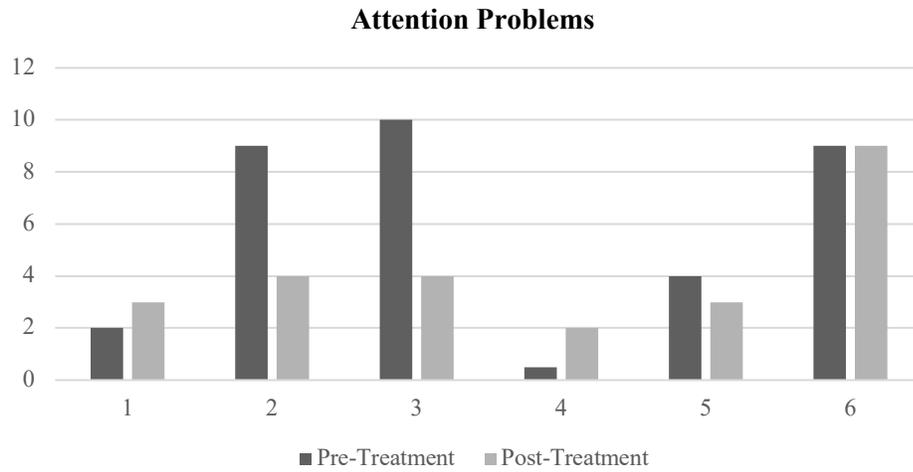
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\*x-axis depicts each participant; y-axis depicts T-scores for Daytime Sleepiness and PROMIS Sleep Disturbances

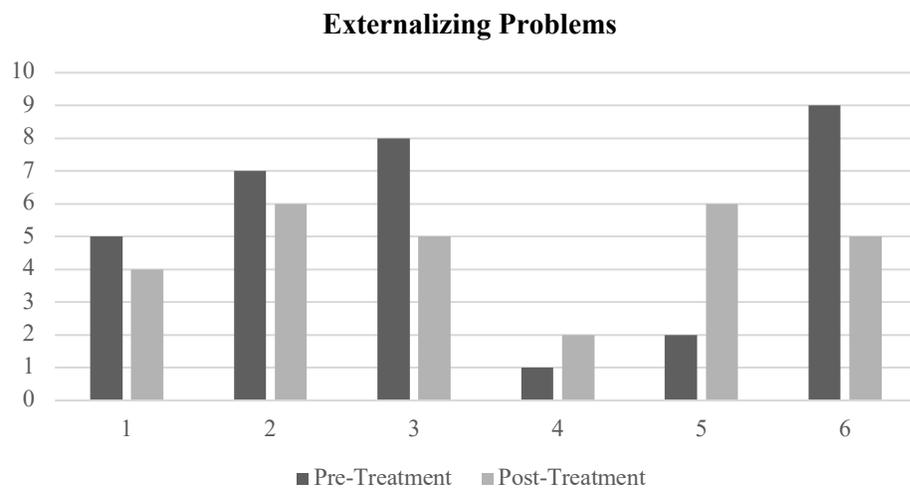
**Figure 3.** Pre- to post-treatment self-reported differences on youth’s internalizing and externalizing symptoms.



3c.



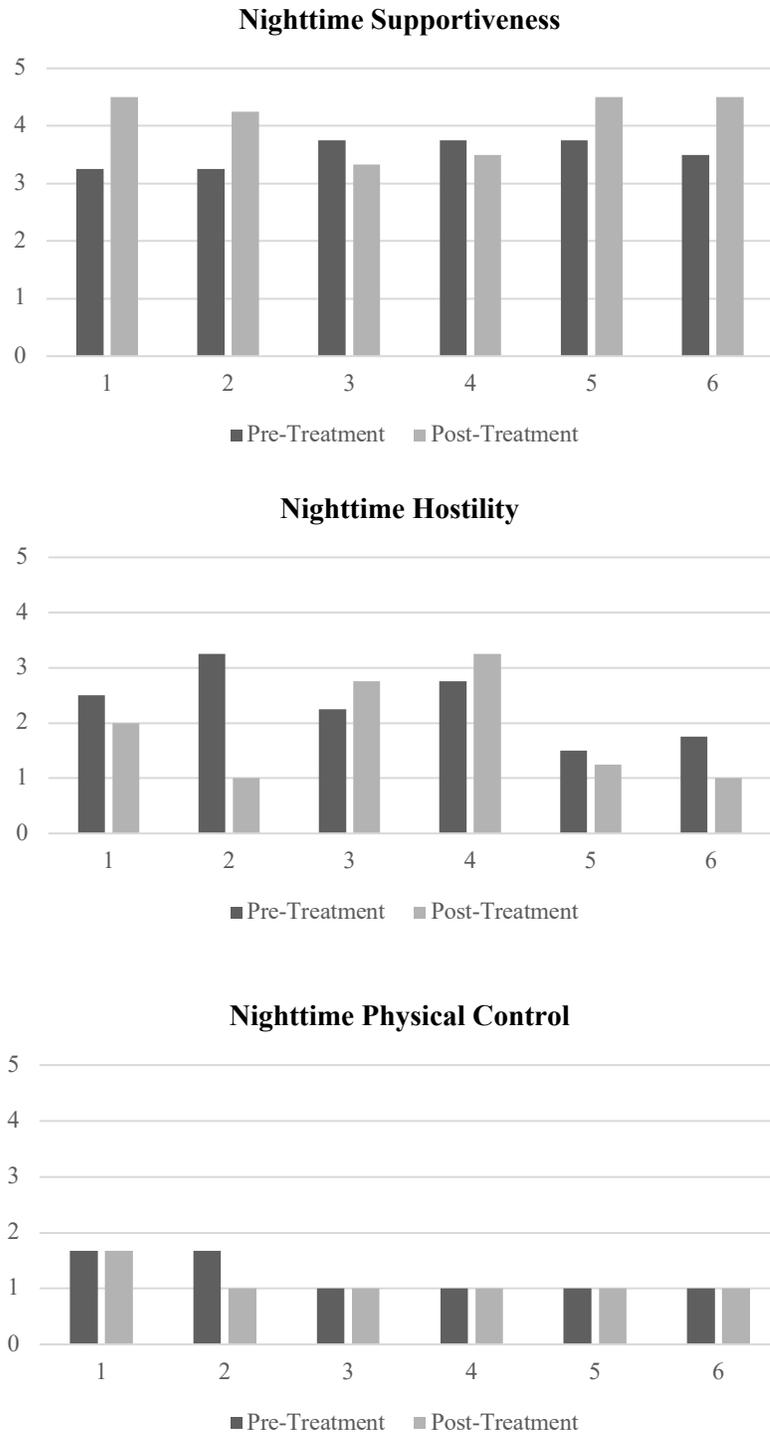
3d.



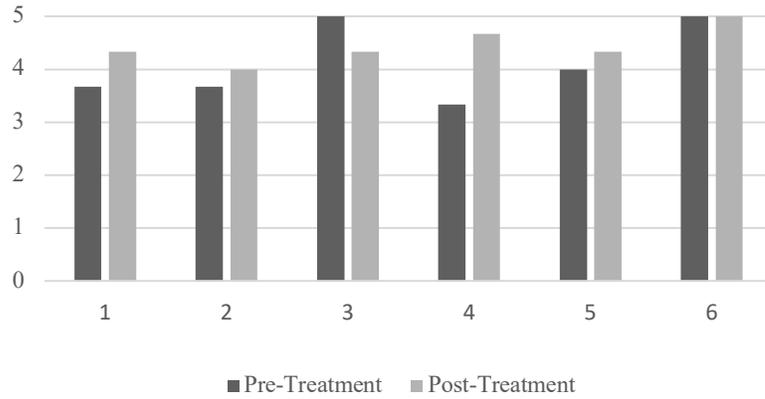
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\*\*x-axis depicts each participant; y-axis depicts T-scores for PROMIS Anxiety and PROMIS Depressive Symptoms

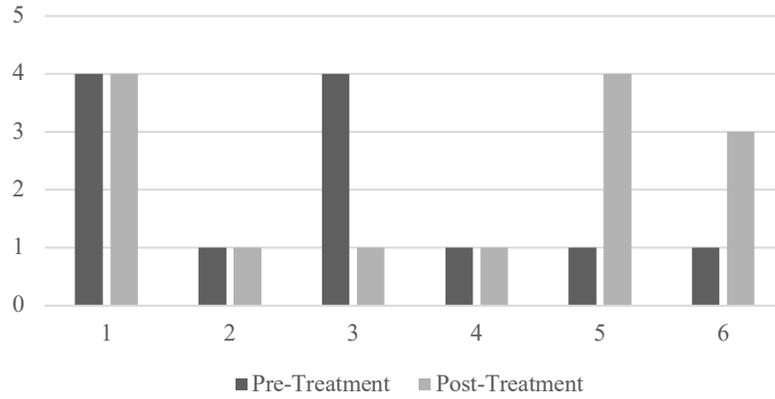
**Figure 4.** Pre- to post-treatment parent-reported changes on nighttime parenting domains.



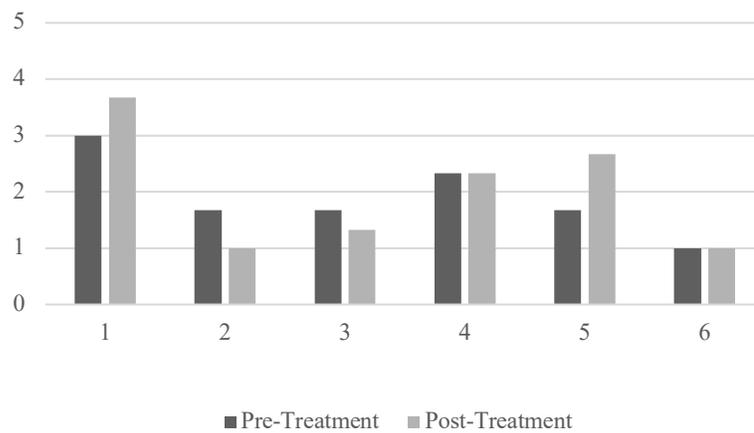
### Nighttime Limit-Setting



### Nighttime Media Monitoring



### Nighttime Co-Sleeping



\*x-axis depicts each parent participant

**Table 3.1.** Family-Based Sleep Intervention for Teens (FABSleep) – Treatment Structure

| FABSleep Session                  | 1: Motivation, Orientation, and Benefits   | 2: Thoughts, Feelings, and Behaviors   | 3: Daytime Sleep-Promoting Habit   | 4: Regular Sleep-Wake Schedule  | 5: Restricting Media Use  | 6: Positive Emotions and Relapse Prevention   |
|-----------------------------------|--|--|--|---|---|---|
| <b>Youth Protocol Components</b>  | <p>Psychoeducation on sleep during adolescence.</p> <p>Discussion about the possibility of improving sleep.</p> <p>Identifying “pros” and “cons” of developing healthy sleep habits.</p> <p>Establish goals for treatment.</p> | <p>Review sleep regulatory systems</p> <p>Psychoeducation on the thoughts-feelings-behavior triangle</p> <p>Exercise on functional analysis on sleep-interfering thoughts, feelings, and behaviors</p> <p>Discussion of nighttime sleep-promoting habits (i.e., regular bedtime, lights out cue, wind-down routine, stimulus control).</p>                                 | <p>Review nighttime sleep-promoting habits and savoring practice.</p> <p>Psychoeducation on daytime sleep-promoting habits (e.g., light cues, brisk wake up, wake-up routine, short and early naps, restrict caffeine).</p> <p>Discussion of scheduled worrying.</p> <p>Discussion of affective switching.</p> | <p>Maintaining a consistent sleep and wake time.</p> <p>Psychoeducation on circadian rhythms and sleep in teenagers.</p> <p>Identify barriers and solutions to maintaining a consistent sleep-wake schedule.</p> <p>Explore ways to limit daytime naps.</p> | <p>Explore how media interferes with sleep.</p> <p>Develop a behavioral contract for limiting media use at bedtime.</p> <p>Skills: diaphragmatic breathing and savoring as sleep-promoting bedtime practices.</p> <p>Guided practice of diaphragmatic breathing and savoring.</p> | <p>Review treatment progress.</p> <p>Review learned skills to improve sleep.</p> <p>Discuss the value of positive emotions and savoring to facilitate sleep.</p> <p>Develop a relapse prevention plan.</p>  |
| <b>Parent Protocol Components</b> | <p>Psychoeducation on sleep during adolescence.</p> <p>Discuss importance of parental involvement</p> <p>Identify benefits and barriers to involvement</p> <p>Established goals for treatment</p>                              | <p>Benefits and barriers to supporting patient into changing their nighttime habits.</p> <p>Psychoeducation on the thoughts-feelings-behavior triangle.</p> <p>Identify sleep-interfering behaviors for youth.</p> <p>Discussion on what helps youth sleep well at night.</p> <p>Discussion on the importance of positivity before bedtime (i.e., positive attending).</p> | <p>Review concept of homeostatic drive.</p> <p>Psychoeducation on daytime sleep-promoting habits.</p> <p>Skill: modeling sleep-promoting behaviors.</p> <p>Skill: praising and rewarding sleep-promoting behaviors by youth.</p>   | <p>Supporting a consistent sleep and wake time.</p> <p>Psychoeducation on circadian rhythms and sleep in teenagers.</p> <p>Skill: family problem-solving.</p>   | <p>Explore how media interferes with sleep.</p> <p>Recommendations on managing youth’s media use at bedtime.</p> <p>Skill: effective communication.</p>   | <p>Reviewed overall treatment progress.</p> <p>Review learned parenting skills to support the improvement youth’s sleep.</p> <p>Psychoeducation on important adolescence milestones.</p> <p>Skill: scaffolding.</p> <p>Develop a relapse prevention plan.</p> |



|   |  |  |  |   |   |  |
|---|--|--|--|---|---|--|
| <b>Youth &amp; Parent Protocol Components</b> | Youth and parents share treatment goals with one another.        | In-session savoring practice.                                      | Discuss benefits of receiving social support during treatment.<br><br>Identify types of support that parents can offer.<br><br>Brainstorm potential rewards. | Identify types of support parents can offer to assist patient in maintaining a regular sleep-wake schedule.<br><br>Design a Sleep Plan for youth. | Discuss behavioral contract.<br><br>Identify types of support that parents can offer to assist patient in restricting their media use at bedtime. | Discuss youth's relapse prevention plan.<br><br>Identify types of support that parents can offer to assist patient in maintaining their relapse prevention plan. |
| <b>Fidelity (%)</b>                           | Youth Session = 83<br>Parent Session = 83<br>Youth + Parent = 66 | Youth Session = 100<br>Parent Session = 93<br>Youth + Parent = 100 | Youth Session = 66<br>Parent Session = 100<br>Youth + Parent = 88  | Youth Session = 100<br>Parent Session = 100<br>Youth + Parent = 66  | Youth Session = 92<br>Parent Session = 100<br>Youth + Parent = 83   | Youth Session = 100<br>Parent Session = 100<br>Youth + Parent = 50   |

**Table 3.2.** Sociodemographic information for the present study sample.

| <b>Demographic Characteristics</b> | <b><i>M (SD) or %</i></b><br><b><i>N = 6</i></b> |
|------------------------------------|--|
| Child Age                          | 11.8 (2.1)                                       |
| Parent Age                         | 40.2 (9.1)                                       |
| Child Sex (% Female)               | 66.6   |
| Parent Sex (% Mothers)             | 83.3   |
| Child Race/Ethnicity               |  |
| White                              | 50   |
| Hispanic                           | 66.7   |
| Parent Race/Ethnicity              |  |
| White                              | 50   |
| Hispanic                           | 66.7   |
| Family Structure                   |  |
| Single                             | 16.7   |
| Married                            | 66.7   |
| Separated/Divorced                 | 16.7   |
| Family Income                      |  |
| Under \$20,000                     | 16.7   |
| \$20,000 - \$34,999                | 33.3   |
| \$35,000 - \$49,999                | 16.7   |
| \$75,000 - \$99,999                | 16.7   |
| Over \$100,000                     | 16.7   |
| Parent Education                   |  |
| H.S or GED                         | 33.3   |
| Some College                       | 16.7   |
| College Degree                     | 50   |

*Note:* H.S High School

**Table 3.3.** Change in youth- and parent-reported sleep health domains from pre- to post-treatment.

| <b>Youth Report</b>       | <b>Mean (SD) - Pre</b> | <b>Mean (SD) - Post</b> | <b>T-test</b> | <b>Hedges' <i>g</i></b> | <b>RCI</b> |
|---------------------------|------------------------|-------------------------|---------------|-------------------------|------------|
| Sleep Satisfaction        | 2.0 (1.1)              | 2.83 (1.3)              | -1.633        | -.659                   | -1.63      |
| SRI/Alertness             | 18.67 (9.0)            | 13.66 (4.9)             | 1.451         | .586                    | -1.45      |
| Timing                    | 2.3 (.81)              | 2.3 (.51)               | .000          | .685                    | 0          |
| Sleep Efficiency (%)      | 90.3                   | 95.09 (3.71)            | -3.129*       | -1.263                  | -3.13      |
| Sleep Duration (HH:MM)    | 8:15 (1:57)            | 8:57 (1:27)             | -2.087        | -.843                   | -2.13      |
| Sleep Hygiene             | 2.46 (.69)             | 1.99 (.20)              | 1.741         | .703                    | 1.74       |
| Sleep Disturbances        | 2.79 (.58)             | 2.15 (.76)              | 2.240         | .904                    | 2.24       |
| Electronics at Bedtime    | 2.88 (1.4)             | 1.47 (.60)              | 2.858*        | 1.077                   | 2.66       |
| Bedtime Worries           | 3.50 (1.18)            | 2.66 (.76)              | 2.988*        | 1.126                   | 2.98       |
| Sleep Onset Latency (Min) | 33.3 (10.3)            | 23.3 (15)               | 4.0*          | 1.615                   | 4          |
| <b>Parent Report</b>      | <b>Mean (SD) - Pre</b> | <b>Mean (SD) - Post</b> | <b>T-test</b> | <b>Hedges' <i>g</i></b> | <b>RCI</b> |
| Sleep Satisfaction        | 1.33 (.52)             | 2.16 (.75)              | -5.0*         | -1.884                  | -4.99      |
| SRI/Alertness             | 20.17 (3.9)            | 12.5 (5.5)              | 1.487         | .560                    | 1.48       |
| Timing                    | 2.83 (.4)              | 2.5 (.54)               | 1.581         | .596                    | 1.58       |
| Sleep Efficiency (%)      | 93.84                  | 96.1 (2.7)              | -1.767        | -.666                   | -1.76      |
| Sleep Duration (HH:MM)    | 8:50 (1:35)            | 9:50 (1:20)             | -1.542        | -.581                   | 1.53       |
| Sleep Hygiene             | 2.36 (.46)             | 2.04 (.26)              | 3.544*        | .959                    | 2.54       |
| Sleep Disturbances        | 2.62 (.28)             | 2.21 (.50)              | 2.909*        | 1.096                   | 2.91       |
| Electronics at Bedtime    | 2.22 (1.06)            | 1.77 (.65)              | 1.581         | .596                    | 1.58       |
| Bedtime Worries           | 2.92 (.66)             | 2.58 (1.4)              | .466          | .176                    | .46        |
| Sleep Onset Latency (Min) | 25.83 (16.18)          | 20.42 (15.9)            | .859          | .351/.324               | 0.86       |

\**p*-value < .0

**Table 3.4.** Change in youth- and parent-reported mental health difficulties from pre- to post-treatment.

| <b>Youth Report</b>    | <b>Mean (SD) -<br/>Pre</b> | <b>Mean (SD) -<br/>Post</b> | <b>T-test</b> | <b>Hedges' <i>g</i></b> | <b>RCI</b> |
|------------------------|----------------------------|-----------------------------|---------------|-------------------------|------------|
| Anxiety                | 32.17 (6.4)                | 22.33 (11.6)                | 3.016*        | 1.22                    | 3.01       |
| Depressive Symptoms    | 22.17 (12)                 | 13.66 (4.9)                 | 3.615*        | 1.46                    | 3.61       |
| Externalizing Problems | 1.76 (.47)                 | 1.66 (.21)                  | .725          | .293                    | .725       |
| Attention Problems     | 1.94 (.70)                 | 1.69 (.41)                  | 1.580         | .638                    | 1.58       |
| <b>Parent Report</b>   | <b>Mean (SD) -<br/>Pre</b> | <b>Mean (SD) -<br/>Post</b> | <b>T-test</b> | <b>Hedges' <i>g</i></b> | <b>RCI</b> |
| Anxiety                | 32.17 (6.4)                | 17.83 (5.7)                 | 2.320         | .874                    | 2.32       |
| Depressive Symptoms    | 22.17 (12)                 | 11.83 (5.5)                 | 2.123         | .80                     | 2.12       |
| Externalizing Problems | 1.76 (.47)                 | 1.67 (.52)                  | 2.051         | .772                    | 2.05       |
| Attention Problems     | 1.94 (.70)                 | 1.66 (.42)                  | 3.503*        | 1.32                    | 3.76       |

\**p*-value < .05; RCI = Reliable Change Index

**Table 3.5.** Change in youth- and parent-reported parenting practices from pre- to post-treatment.

| <b>Youth Report</b>        | <b>Mean (SD) -<br/>Pre</b> | <b>Mean (SD) -<br/>Post</b> | <b>T-test</b> | <b>Hedges' <i>g</i></b> | <b>RCI</b> |
|----------------------------|----------------------------|-----------------------------|---------------|-------------------------|------------|
| Nighttime Supportiveness   | 2.71 (.85)                 | 2.50 (.86)                  | .336          | .126                    | .335       |
| Nighttime Hostility        | 2.2 (.99)                  | 2.25 (.92)                  | -.128         | -.048                   | -.128      |
| Nighttime Physical Control | 1.55 (.77)                 | 1.50 (.93)                  | .415          | .156                    | .415       |
| Nighttime Limit-Setting    | 3.61 (.74)                 | 3.17 (1.2)                  | .628          | .236                    | .627       |
| Nighttime Media Monitoring | 2.83 (1.6)                 | 2.50 (1.0)                  | .415          | .156                    | .415       |
| Nighttime Co-Sleeping      | 2.11 (1.5)                 | 1.94 (1.5)                  | 1.46          | .551                    | -1.32      |
| <b>Parent Report</b>       |                            |                             |               |                         |            |
| Nighttime Supportiveness   | 3.54 (.24)                 | 4.10 (.54)                  | -1.92         | -.724                   | -1.92      |
| Nighttime Hostility        | 2.33 (.64)                 | 1.87 (.96)                  | 1.10          | .416                    | 1.10       |
| Nighttime Physical Control | 1.22 (.34)                 | 1.11 (.27)                  | 1.0           | .377                    | 1.0        |
| Nighttime Limit-Setting    | 4.11 (.72)                 | 4.44 (.34)                  | -1.23         | -.461                   | -1.22      |
| Nighttime Media Monitoring | 2.0 (1.5)                  | 2.33 (1.5)                  | -.395         | -.149                   | -.395      |
| Nighttime Co-Sleeping      | 1.89 (.69)                 | 2.0 (1.1)                   | -.439         | -.165                   | -.438      |
| General/Daytime PP         | 3.97 (.54)                 | 4.2 (.55)                   | -1.79         | -.678                   | -1.79      |
| General/Daytime NP         | 2.12 (.45)                 | 1.77 (.42)                  | 1.33          | .501                    | 1.33       |
| Supportive ESP             | 5.76 (1.0)                 | 6.09 (.61)                  | -.718         | -.270                   | -.717      |
| Unsupportive ESP           | 2.82 (.45)                 | 3.35 (.75)                  | -1.27         | -.478                   | -1.27      |

\*PP = positive practices; NP = negative practices; ESP = emotion socialization practice

## References

- Abe-Kim, J., Takeuchi, D.T., Hong, S., Zane, N., Sue, S., Spencer, M.S., Appel, H., Nicdao, E., & Alegria, M. (2007). Use of mental health-related services among immigrant and US-Born Asian American: Results from the National Latino and Asian American Study. *American Journal of Public Health, 97*(1), 91-98. doi: [10.2105/AJPH.2006.098541](https://doi.org/10.2105/AJPH.2006.098541).
- Achenbach, T. M. (2009). *The Achenbach system of empirically based assessment (ASEBA): Development, findings, theory, and applications*. Burlington: University of Vermont, Research Center for Children, Youth, and Families.
- Achenbach, T. M., McConaughy, S. H., Ivanova, M. Y., & Rescorla, L. A. (2011). Manual for the ASEBA Brief Problem Monitor (BPM). Burlington: University of Vermont, Research Center for Children, Youth, and Families.
- Achenbach, T.M., & Rescorla, L.A. (2001). Manual for the ASEBA Preschool Forms and Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Acosta, J., Parent, J., Hare, MS., DiMarzio, K., & Sisitsky, M., & McMakin, D.L. (2022). The Nighttime Parenting Scale: Assessing the impact of specific versus general parenting practices on youth's sleep health during a sensitive developmental stage. *Under review*.
- Acosta, J., Parent, J., McMakin, D. L., McKee, L., DiMarzio, K., & Dale, C. (2021). Longitudinal associations between parenting practices and youth sleep problems. *Journal of Developmental and Behavioral Pediatrics, 42*(9), 751-760. doi: [10.1097/DBP.0000000000000953](https://doi.org/10.1097/DBP.0000000000000953).
- Alegria, M., Vallas, M., & Pumariega, A. J. (2010). Racial and ethnic disparities in pediatric mental health. *Child and Adolescent Psychiatric Clinics of North America, 19*(4), 759–774.
- Alfano, C.A., Pina, A.A., Zerr, A.A., & Villalta, I.K. (2010). Pre-sleep arousal and sleep problems of anxiety-disordered youth. *Child Psychiatry & Human Development, 41*(2), 156-167. doi: [10.1007/s10578-009-0158-5](https://doi.org/10.1007/s10578-009-0158-5).
- Alvaro, P.K., Roberts, R.M., & Harris, J.K. (2013). A Systematic Review Assessing Bidirectionality between Sleep Disturbances, Anxiety, and Depression. *Sleep, 36*(7), 1059-1068. doi: [10.5665/sleep.2810](https://doi.org/10.5665/sleep.2810).
- American Medical Association, American Academy of Sleep Medicine. American Medical Association. (2010). Resolution 503: Insufficient sleep in adolescents. Chicago, IL
- Bakk, Z., Tekle, F.B., Vermunt, J.K. (2013). Estimating the Association between Latent Class Membership and External Variables Using Bias-adjusted Three-step Approaches. *Sociological Methodology, 43*(1), 272-311. doi:[10.1177/0081175012470644](https://doi.org/10.1177/0081175012470644)

- Beebe, D.W. (2006). Neurobehavioral morbidity associated with disordered breathing during sleep in children: a comprehensive review. *Sleep, 29*, 1115–1134. doi: 10.1093/sleep/29.9.1115.
- Bei, B., Byrne, M.L., Ivens, C., Waloszek, J., Woods, M.J., Dudgeon, P., Murray, G., Nicholas, C.L., Trinder, J. & Allen, N.B. (2013). Pilot study of a mindfulness-based, multi-component, in-school group sleep intervention in adolescent girls. *Early Intervention Psychiatry, 7*(2), 213-220. doi: 10.1111/j.1751-7893.2012.00382.x.
- Bell, B.G., & Belsky, J. (2008). Parents, parenting, and children’s sleep problems: Exploring reciprocal effects. *British Journal of Developmental Psychology, 26*, 579–593.
- Blake, M., Waloszek, J.M., Schwartz, O., Raniti, M., Simmons, J.G., Blake, L., Murray, G., Dahl, R.E., Bootzin, R., Dudgeon, P., Trinder, J., & Allen, N.B. (2016). The SENSE study: Post intervention effects of a randomized controlled trial of a cognitive-behavioral and mindfulness-based group sleep improvement intervention among at-risk adolescents. *Journal of Consulting and Clinical Psychology, 84*(12), 1039-1051. doi: 10.1037/ccp0000142.
- Blake, M.J., Blake L.M., Schwartz, O., Raniti, M., Waloszek, J.M., Murray, G., Simmons, J.G., Landau, E., Dahl, R.E., McMakin, D.L., Dudgeon, P., Trinder, J., & Allen, N.B. (2018) Who benefits from adolescent sleep interventions? Moderators of treatment efficacy in a randomized controlled trial of a cognitive-behavioral and mindfulness-based group sleep intervention for at-risk adolescents. *Journal of Child Psychology and Psychiatry, 59*(6), 637-649. doi: 10.1111/jcpp.12842.
- Blunden, S.L., Chapman, J., & Rigney, G.A. (2012). Are sleep education programs successful? The case for improved and consistent research efforts. *Sleep Medicine Reviews, 16*(4), 355-370. doi: 10.1016/j.smrv.2011.08.002.
- Bonnar, D., Gradisar, M., Moseley, L., Coughlin, A.M., Cain, N., & Short, M.A. (2015). Evaluation of novel school-based interventions for adolescent sleep problems: does parental involvement and bright light improve outcomes? *Sleep Health, 1*(1):66-74. doi: 10.1016/j.sleh.2014.11.002.
- Bosco, G. L., Renk, K., Dinger, T. M., Epstein, M. K., & Phares, V. (2003). The connections among adolescents’ perceptions of parents, parental psychological symptoms, and adolescent functioning. *Journal of Applied Developmental Psychology, 24*, 179–200. [http://dx.doi.org/ 10.1016/S0193-3973\(03\)00044-3](http://dx.doi.org/10.1016/S0193-3973(03)00044-3).
- Brand, S., Gerber, M., Beck, J., Kalak, N., Hatzinger, M., Pühse, U., & Holsboer-Trachsler, E. (2011). Perceived parenting styles differ between genders but not between elite athletes and controls. *Adolescent health, medicine and therapeutics, 2*, 9–14. doi: 10.2147/AHMT.S16992.

- Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (pp. 187–249). Jessica Kingsley Publishers.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Press.
- Buysse, D.J. (2014). Sleep health: can we define it? Does it matter? *Sleep*, *37*(1), 9–17. doi:10.5665/sleep.3298
- Carskadon, M.A., Vieira, C., & Acebo, C. (1993). Association between puberty and delayed phase preference. *Sleep*, *16*(3), 258–62. doi: 10.1093/sleep/16.3.258.
- Chandler, J., Paolacci, G., Peer, E., Mueller, P., & Ratliff, K.A. (2015). Using Nonnaive Participants Can Reduce Effect Sizes. *Psychological Science*, *26*(7), 1131–1139. doi:10.1177/0956797615585115.
- Chu, J.T, Bullen, P., Farruggia, S.P., Dittman, C.K., & Sanders, M.R. (2015). Parent and Adolescent Effects of a Universal Group Program for the Parenting of Adolescents. *Prevention Science*, *16*(4), 609–620. doi: 10.1007/s11121-014-0516-9.
- Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: a latent profile analysis. *European Journal of Psychotraumatology*, *4*, doi:10.3402/ejpt.v4i0.20706
- Combs, D., Goodwin, J. L., Quan, S. F., Morgan, W. J., & Parthasarathy, S. (2016). Longitudinal differences in sleep duration in Hispanic and Caucasian children. *Sleep medicine*, *18*, 61–66. doi:10.1016/j.sleep.2015.06.008.
- Comer, J.S., Furr, J.M., Miguel, E.M., Cooper-Vince, C.E., Carpenter, A.L., Elkins, R.M., Kerns, C.E., Cornacchio, D., Chou, T., Coxe, S., Deserisy, M., Sanchez, A.L., Golik, A., Martin, J., Myers, K.M. & Chase R. (2017). Remotely delivering real-time parent training to the home: An initial randomized trial of Internet-delivered parent-child interaction therapy (I-PCIT) *Journal of Consulting and Clinical Psychology*, *85*(9), 909–917. doi: 10.1037/ccp0000230.
- Compas, B. E., Forehand, R., Keller, G., Champion, J. E., Rakow, A., Reeslund, K. L., McKee, L., Fear, J. M., Colletti, C. J., Hardcastle, E., Merchant, M. J., Roberts, L., Potts, J., Garai, E., Coffelt, N., Roland, E., Sterba, S. K., & Cole, D. A. (2009). Randomized controlled trial of a family cognitive-behavioral preventive intervention for children of depressed parents. *Journal of Consulting and Clinical Psychology*, *77*(6), 1007–1020. doi: 10.1037/a0016930.
- Crone, E. & Dahl, R. (2012). Understanding adolescence as a period of social–affective engagement and goal flexibility. *Nature Reviews Neuroscience*, *13*, 636–650. doi: 10.1038/nrn3313.



- Crowley, S.J., Acebo, C., Carskadon, M.A. (2006), Sleep, circadian rhythms, and delayed phase in adolescence. *Sleep Medicine*, 8(6), 602-112. doi: 10.1016/j.sleep.2006.12.002.
- Cummings, E. M., Davies, P. T., & Campbell, S. B. (2000). *Developmental psychopathology and family process: Theory, research, and clinical implications*. Guilford Press.
- Dahl, R.E. (1996) The impact of inadequate sleep on children's daytime cognitive function. *Seminars in Pediatric Neurology*, 3, 44-50. doi: 10.1016/s1071-9091(96)80028-3.
- Dahl, R.E. & El-Sheikh M. (2007) Considering sleep in a family context: Introduction to the special issue. *Journal of Family Psychology*, 21, 1-3. doi: 10.1037/0893-3200.21.1.1.
- Derr, A. S. (2016). Mental health service use among immigrants in the United States: A systematic review. *Psychiatric Services (Washington, D.C.)*, 67(3), 265–274.
- Dudenev, J., Sharpe, L. & Hunt, C. (2015). Attentional bias towards threatening stimuli in children with anxiety: A meta-analysis. *Clinical Psychology Review*, 40, 66-75. doi: 10.1016/j.cpr.2015.05.007.
- Eisenberg, N., Cumberland, A., & Spinrad, T.L. (1998) Parental Socialization of Emotion. *Psychological Inquiry*, 9(4), 241–273. doi:10.1207/s15327965pli0904\_1.
- Eisenberg, N., Spinrad, T.L., & Eggum, N.D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology*, 6, 495–525. doi:10.1146/annurev.clinpsy.121208.131208
- El-Sheikh, M. & Kelly, R.J. (2017) Family Functioning and Children's Sleep. *Child Development Perspectives*, 11(4), 264-269. doi:10.1111/cdep.12243
- Eyberg, S., & Funderburk, B. (2011). *Parent – Child Interaction Therapy Protocol*. Gainesville, FL: PCIT International Publishing.
- Fabes, R. A., Poulin, R. E., Eisenberg, N., & Madden-Derdich, D. A. (2002). The Coping with Children's Negative Emotions Scale (CCNES): Psychometric properties and relations with children's emotional competence. *Marriage & Family Review*, 34(3-4), 285–310. doi: 10.1300/J002v34n03\_05.
- Fabes, R.A., Eisenberg, N., & Bernzweig, J. (1990). The Coping with Children's Negative Emotions Scales. (CCNES): Description and scoring. Tempe, AZ: Arizona State University.
- Florea, I.S., Dobrea, A., Păsăreanu, C.R., Georgescu, R.D., & Milea, I. (2020). The Efficacy of Internet-Based Parenting Programs for Children and Adolescents with Behavior Problems: A Meta-Analysis of Randomized Clinical Trials. *Clinical Child and Family Psychology Review*, 23(4), 510–528 (2020). doi:10.1007/s10567-020-00326-0.

- Flujas-Contreras, J., García-Palacios, A., & Gómez, I. (2019). Technology-based parenting interventions for children's physical and psychological health: A systematic review and meta-analysis. *Psychological Medicine*, *49*(11), 1787-1798. doi: 10.1017/S0033291719000692.
- Forbes, E. E., Bertocci, M. A., Gregory, A. M., Ryan, N. D., Axelson, D. A., Birmaher, B., & Dahl, R. E. (2008). Objective sleep in pediatric anxiety disorders and major depressive disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, *47*(2), 148–155. doi: 10.1097/chi.0b013e31815cd9bc.
- Forehand, R., Thigpen, J. C., Parent, J., Hardcastle, E. J., Bettis, A., & Compas, B. E. (2012). The role of parent depressive symptoms in positive and negative parenting in a preventive intervention. *Journal of Family Psychology*, *26*(4), 532–541. doi:10.1037/a0028406.
- Forrest, C.B., Meltzer, L.J., Marcus, C.L., de la Motte, A., Kratchman, A., Buysse, D.J., Pilkonis, P.A., Becker, B.D. & Bevans, K.B. (2018). Development and validation of the PROMIS Pediatric Sleep Disturbance and Sleep-Related Impairment item banks. *Sleep*, *41*(6). doi: 10.1093/sleep/zsy054.
- Gassman-Pines, A., Ananat, E.O., Fitz-Henley, J. 2nd. (2020). COVID-19 and Parent-Child Psychological Well-being. *Pediatrics*, *146*(4), e2020007294. doi: 10.1542/peds.2020-007294.
- Gregory, A.M. & Sadeh, A. (2012). Sleep, emotional and behavioral difficulties in children and adolescents. *Sleep Medicine Reviews*, *16*(2), 129-36. doi: 10.1016/j.smr.2011.03.007.
- Guglielmo, D., Gazmararian, J. A., Chung, J., Rogers, A. E., & Hale, L. (2018). Racial/ethnic sleep disparities in US school-aged children and adolescents: a review of the literature. *Sleep health*, *4*(1), 68–80. doi:10.1016/j.sleh.2017.09.005.
- Gunn, H.E., O'Rourke, F., Dahl, R.E., et al. (2019) Young adolescent sleep is associated with parental monitoring. *Sleep Health*, *5*(1), 58-63. doi: 10.1016/j.sleh.2018.09.001.
- Hackell, J.M, Abularrage, J.J., Almendarez, Y.M., Arauz, A.D., Boudreau, A., Abeba M. Berhane, P.E. Cantrell, L.M. Kafer, K.S. Schafer, A.S, Warner, R., Hagan, J.F., Kemper, A.R., & Shaw, J.S. (2021) Recommendations for Preventive Pediatric Health Care. *Pediatrics*, *147*(3). doi: 10.1542/peds.2020-049776.
- Hedges LV. (1981). Distribution theory for Glass's estimator of effect size and related estimators. *Journal of Educational Behavioral Statistics*, *6*, 107–128. doi: 10.3102/10769986006002107.
- Herbert, S.D., Harvey, E.A., Roberts, J.L., Wichowski, K., & Lugo-Candelas, C.I. (2013). A randomized controlled trial of a parent training and emotion socialization program for

- families of hyperactive preschool aged children. *Behavior Therapy*, 44, 302–316. doi: 10.1016/j.beth.2012.10.004.
- Higa-McMillan, C. K., Francis, S. E., Rith-Najarian, L., & Chorpita, B. F. (2016). Evidence base update: 50 years of research on treatment for child and adolescent anxiety. *Journal of Clinical Child & Adolescent Psychology*, 45(2), 91–113. doi:10.1080/15374416.2015.1046177.
- Hiller, R.M., Johnston, A., Dohnt, H., Lovato, N. & Gradisar, M. (2015). Assessing cognitive processes related to insomnia: A review and measurement guide for Harvey's cognitive model for the maintenance of insomnia. *Sleep Medicine Reviews*, 23, 46-53. doi: 10.1016/j.smr.2014.11.006.
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1), 12–19. doi: 10.1037/0022-006X.59.1.12
- Jenni, O.G., Achermann, P., & Carskadon, M.A. (2005). Homeostatic sleep regulation in adolescents. *Sleep*, 28(11), 1446-1454. doi: 10.1093/sleep/28.11.1446.
- Jensen-Doss, A., Patel, Z.S., Casline, E., Mora Ringle, V.A., Timpano, K.R. (2021). Using Mechanical Turk to Study Parents and Children: An Examination of Data Quality and Representativeness. *Journal of Clinical Child & Adolescent Psychology*, 15, 1-15. doi: 10.1080/15374416.2020.1815205.
- Jent, J. F., Rothenberg, W. A., Weinstein, A., Stokes, J., Barnett, M., Srivatsa, N., Dandes, E., & Garcia, D. (2021). Comparing Traditional and Ebook-Augmented Parent-Child Interaction Therapy (PCIT): A Randomized Control Trial of Pocket PCIT. *Behavior Therapy*, 52(6), 1311-1324.
- Kelly, R.J., Marks, B.T., & El Sheikh, M. (2014). Longitudinal relations between parent-child conflict and children's adjustment: the role of children's sleep. *Journal of Abnormal Child Psychology*, 42(7), 1175–1185. doi:10.1007/s10802-014-9863-z.
- Kelly, R.J. & El-Sheikh, M. (2014). Reciprocal relations between children's sleep and their adjustment over time. *Developmental Psychology*, 50(4), 1137–1147.
- Khor, S.P.H., McClure, A., Aldridge, G., Bei, B., & Yap, M.B.H. (2021). Modifiable parental factors in adolescent sleep: A systematic review and meta-analysis. *Sleep Medicine Reviews*, 56, 101408. doi: 10.1016/j.smr.2020.101408.
- Lanier, P., Kohl, P. L., Benz, J., Swinger, D., Moussette, P., & Drake, B. (2011). Parent-child interaction therapy in a community setting: Examining outcomes, attrition, and treatment setting. *Research on Social Work Practice*, 21(6), 689–698.

- Leijten, P., Overbeek, G., Janssens, J.M. (2012). Effectiveness of a parent training program in (pre)adolescence: evidence from a randomized controlled trial. *Journal of Adolescence*, 35(4), 833-42. doi: 10.1016/j.adolescence.2011.11.009.
- Liang, Z. & Ploderer, B. (2016). Sleep tracking in the real world: a qualitative study into barriers for improving sleep. In Parker, C (Ed.) *Proceedings of the 28th Australian Computer-Human Interaction Conference (OzCHI 2016)*. Association for Computing Machinery, United States of America, pp. 537-541. 10.1145/3010915.3010988.
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, 44(1), 1-23. doi: 10.3758/s13428-011-0124-6.
- Matsunaga, M. (2010). How to factor-analyze your data right: Do's, don'ts, and how-to's. *International Journal of Psychological Research*, 3(1), 97–110. doi:10.21500/20112084.854.
- McDaniel, B. T., & Teti, D. M. (2012). Coparenting quality during the first three months after birth: The role of infant sleep quality. *Journal of Family Psychology*, 26(6), 886–895. doi: 10.1037/a0030707.
- McMahon, R., & Forehand, R. L. (2003). *Helping the noncompliant child: Family-based treatment for oppositional behavior* (2nd ed.). Guilford.
- McMakin, D. L., & Alfano, C. A. (2015). Sleep and anxiety in late childhood and early adolescence. *Current Opinion in Psychiatry*, 28(6), 483–489. doi:10.1097/YCO.0000000000000204.
- McMakin, D.L, Ricketts, E.J., Forbes, E.E., Silk, J.S., Ladouceur, C.D., Siegle, G.J.,...Dahl, R.E. (2019). Anxiety Treatment and Targeted Sleep Enhancement to Address Sleep Disturbance in Pre/Early Adolescents with Anxiety. *Journal of Clinical Child & Adolescent Psychology*, 48(sup1), S284 S297. doi: 10.1080/15374416.2018.1463534.
- Meijer, A.M., Reitz, E., & Dekovic, M. (2016) Parenting matters: a longitudinal study into parenting and adolescent sleep. *Journal of Sleep Research*, 25, 556–64. doi: 10.1111/jsr.12406. Meltzer, L.J., & Mindell, J.A. (2007). The relationship between child sleep disturbances and maternal sleep, mood, and parenting stress: a pilot study. *Journal of Family Psychology*, 21, 67–73. doi: 10.1037/0893-3200.21.1.67
- Meltzer, L. J., Avis, K. T., Biggs, S., Reynolds, A. C., Crabtree, V. M., & Bevans, K. B. (2013). The Children's Report of Sleep Patterns (CRSP): a self-report measure of sleep for school-aged children. *Journal of Clinical Sleep Medicine: JCSM: official publication of the American Academy of Sleep Medicine*, 9(3), 235–245. doi: 10.5664/jcsm.2486.
- Meltzer, L.J. & Mindell, J.A. (2007). Relationship between child sleep disturbances and maternal sleep, mood, and parenting stress: a pilot study. *Journal of Family Psychology*, 21(1):67-73. doi: 10.1037/0893-3200.21.1.67.

- Meltzer, L.J., Williamson, A.A., & Mindell, J.A. (2021) Pediatric sleep health: It matters, and so does how we define it. *Sleep Medicine Reviews*, 57, [doi: 10.1016/j.smrv.2021.101425](https://doi.org/10.1016/j.smrv.2021.101425).
- Narmandakh A, Roest AM, de Jonge P, Oldehinkel AJ. Psychosocial and biological risk factors of anxiety disorders in adolescents: a TRAILS report. *Eur Child Adolesc Psychiatry*. 2021 Dec;30(12):1969-1982. [doi: 10.1007/s00787-020-01669-3](https://doi.org/10.1007/s00787-020-01669-3).
- National Sleep Foundation. (2014). Sleep in America Poll – Sleep in the Modern Family. *Sleep Health*, 1(2), 13. [doi:10.1016/j.sleh.2015.04.013](https://doi.org/10.1016/j.sleh.2015.04.013).
- O'Neil, K & Penrod, Steve. (2001). Methodological variables in web-based research that may affect results: Sample type, monetary incentives, and personal information. *Behavior research methods, instruments, & computers*. *Journal of the Psychonomic Society, Inc.* 33, 226-33.
- Owens, J., Adolescent Sleep Working Group, & Committee on Adolescence (2014). Insufficient sleep in adolescents and young adults: an update on causes and consequences. *Pediatrics*, 134(3), e921–e932. [doi:10.1542/peds.2014-1696](https://doi.org/10.1542/peds.2014-1696).
- Owens, J.A., Spirit, o A., & McGuinn, M. (2000). The Children's Sleep Habits Questionnaire (CSHQ): Psychometric properties of a survey instrument for school-aged children. *Sleep*, 23, 1043–1051.
- Palmer, C. A., Clementi, M. A., Meers, J. M., & Alfano, C. A. (2018). Co-Sleeping among School-Aged Anxious and Non-Anxious Children: Associations with Sleep Variability and Timing. *Journal of Abnormal Child Psychology*, 46(6), 1321-1332. [doi:10.1007/s10802-017-0387-1](https://doi.org/10.1007/s10802-017-0387-1).
- Parent, J., & Forehand, R. (2017). The Multidimensional Assessment of Parenting Scale (MAPS): Development and psychometric properties. *Journal of Child Family Studies*, 26(8), 2136–2151. [doi: 10.1007/s10826-017-0741-5](https://doi.org/10.1007/s10826-017-0741-5).
- Parent, J., Forehand, R., Dunbar, J. P., Watson, K. H., Reising, M. M., Seehuus, M., & Compas, B. E. (2014). Parent and adolescent reports of parenting when a parent has a history of depression: Associations with observations of parenting. *Journal of Abnormal Child Psychology*, 42(2), 173–183
- Patterson, G. R. (2005). The next generation of PMTO models. *Behavior Therapist*, 28, 25–32.
- Paulson, S. E., & Sputa, C. L. (1996). Patterns of parenting during adolescence: Perceptions of adolescents and parents. *Adolescence*, 31(122), 369–381.
- Pearl, A. M., French, B. F., Dumas, J. E., Moreland, A. D., & Prinz, R. (2014). Bidirectional effects of parenting quality and child externalizing behavior in predominantly single parent, under-resourced African American families. *Journal of Child and Family Studies*, 23(2), 177–188. [doi:10.1007/s10826-012-9692-z](https://doi.org/10.1007/s10826-012-9692-z).

- Phares, V., Fields, S., Kamboukos, D., & Lopez, E. (2005). Still looking for poppa. *American Psychologist*, *60*(7), 735–736. doi:10.1037/0003-066X.60.7.735.
- Prime, H., Wade, M., & Browne, D.T. (2020) Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, *75*(5), 631-643. doi: 10.1037/amp0000660.
- Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, *75*(5), 631–643. doi:10.1037/amp0000660.
- Quach, J. L., Nguyen, C. D., Williams, K. E., & Sciberras, E. (2018). Bidirectional Associations Between Child Sleep Problems and Internalizing and Externalizing Difficulties From Preschool to Early Adolescence. *JAMA pediatrics*, *172*(2), e174363. doi: 10.1001/jamapediatrics.2017.4363.
- Randler, C., Bilger, S., & Díaz-Morales, J. F. (2009) Associations among sleep, chronotype, parental monitoring, and pubertal development among German adolescents. *Journal of Psychology*, *143*, 09–520. doi: 10.3200/JRL.143.5.509-520.
- Rapee, R.M. (2012). Family factors in the development and management of anxiety disorders. *Clinical Child and Family Psychology Review*, *15*(1):69-80. doi: 10.1007/s10567-011-0106-3.
- Reitman, D., & McMahon, R. J. (2012). Constance “Connie” Hanf (1917–2002): The mentor and the model. *Cognitive and Behavioral Practice*, *20*, 106–116. doi: 10.1016/j.cbpra.2012. 02.005
- Ricketts, E. J., Price, R. B., Siegle, G. J., Silk, J. S., Forbes, E. E., Ladouceur, C. D., Harvey, A. G., Ryan, N. D., Dahl, R. E., & McMakin, D. L. (2018). Vigilant attention to threat, sleep patterns, and anxiety in peripubertal youth. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *59*(12), 1309–1322. doi: 10.1111/jcpp.12923
- Riemann, D., Spiegelhalder, K., Feige, B., Voderholzer, U., Berger, M., Perlis, M., & Nissen, C. The hyperarousal model of insomnia: a review of the concept and its evidence. *Sleep Medicine Reviews*, *14*(1), 19-31. doi: 10.1016/j.smr.2009.04.002.
- Rigney, G., Blunden, S., Maher, C., Dollman, J., Parvazian, S., & Matricciani, L., & Olds, T. (2015). Can a school-based sleep education programme improve sleep knowledge, hygiene and behaviours using a randomised controlled trial. *Sleep Medicine*, *16*(6), 736-45. doi: 10.1016/j.sleep.2015.02.534.
- Roberts, R. E., & Duong, H. T. (2014). The prospective association between sleep deprivation and depression among adolescents. *Sleep*, *37*(2), 239–244. doi:10.5665/sleep.3388.
- Rodriguez, V. J., La Barrie, D. L., Zegarac, M. C., & Shaffer, A. (2021). A Systematic Review of Parenting Scales Measurement Invariance/Equivalence of by Race and Ethnicity:

Recommendations for Inclusive Parenting Research. *Assessment*. doi:  
[10.1177/10731911211038630](https://doi.org/10.1177/10731911211038630).

- Roesch, S.C., Villodas, M., & Villodas, F. (2010). Latent class/profile analysis in maltreatment research: A commentary on Nooner et al., Pears et al., and looking beyond. *Child Abuse & Neglect*, *34*(3), 155-160. doi: 10.1016/j.chiabu.2010.01.003.
- Rothenberg, W. A., Weinstein, A., Dandes, E. A., & Jent, J. (2019). Improving child emotion regulation: Effects of parent-child interaction-therapy and emotion socialization strategies. *Journal of Child and Family Studies*, *28*, 720-731. doi: 10.1007/s10826-018-1302-2
- Sadeh, A., Dahl, R.E., Shahar, G., & Rosenblat-Stein, S. (2009). Sleep and the transition to adolescence: a longitudinal study. *Sleep*, *32*(12), 1602-1609. doi: 10.1093/sleep/32.12.1602.
- Sadeh, A., Raviv, A., & Gruber, R. (2000). Sleep patterns and sleep disruptions in school-age children. *Developmental Psychology*, *36*(3), 291-301. doi: 10.1037//0012-1649.36.3.291.
- Sadeh, A., Tikotzky, L., Scher, A. (2010). Parenting and infant sleep. *Sleep Medicine Reviews*, *14*(2), 89-96. doi: 10.1016/j.smr.2009.05.003.
- Sanders, W., Parent, J., Forehand, R., & Breslend, N. L. (2016). The roles of general and technology-related parenting in managing youth screen time. *Journal of Family Psychology*, *30*(5), 641–646. doi:10.1037/fam0000175.
- Sanders, W., Zeman, J., Poon, J., et al. (2015). Child regulation of negative emotions and depressive symptoms: The moderating role of parental emotion socialization. *Journal of Child and Family Studies*, *24*, 402-415.
- Schuhmann, E.M., Foote, R.C., Eyberg, S.M., Boggs, S.R. & Algina, J. (1998). Efficacy of parent-child interaction therapy: interim report of a randomized trial with short-term maintenance. *Journal of Clinical Child Psychology*, *27*(1):34-45. doi: 10.1207/s15374424jccp2701\_4.
- Shapiro, D. N., Chandler, J., & Mueller, P. A. (2013). Using Mechanical Turk to study clinical populations. *Clinical Psychological Science*, *1*(2), 213–220. doi: [10.1177/2167702612469015](https://doi.org/10.1177/2167702612469015).
- Shimizu, M., Zeringue, M.M., Erath, S.A., Hinnant, J.B., El-Sheikh, M. (2020) Trajectories of sleep problems in childhood: associations with mental health in adolescence. *Sleep*, *44*(3), zsa190. doi: 10.1093/sleep/zsa190.
- Shochat, T., Cohen-Zion, M., & Tzischinsky, O. (2014) Functional consequences of inadequate sleep in adolescents: a systematic review. *Sleep Medicine Reviews*, *18*(1),75-87. doi: 10.1016/j.smr.2013.03.005.

- Short, M. A., Gradisar, M., Gill, J., & Camfferman, D. (2013). Identifying adolescent sleep problems. *PloS one*, *8*(9), e75301. doi:10.1371/journal.pone.0075301.
- Short, M.A., Gradisar, M., Wright, H., et al. (2011). Time for bed: parent-set bedtimes associated with improved sleep and daytime functioning in adolescents. *Sleep*, *34*(6), 797–800. doi:10.5665/SLEEP.1052
- Spielman, A.J., Saskin, P., Thorpy, M.J. (1987). Treatment of chronic insomnia by restriction of time in bed. *Sleep*, *10*(1), 45-56.
- Sullivan, A., Forehand, R., Acosta, J., Parent, J., Comer, J. S., Loiselle, R., & Jones, D. J. (2021). COVID-19 and the Acceleration of Behavioral Parent Training Telehealth: Current Status and Future Directions. *Cognitive and behavioral practice*, *28*(4), 618–629. doi: 10.1016/j.cbpra.2021.06.012.
- Super, C. M., & Harkness, S. (2013). Culture and children's sleep. In A. R. Wolfson & H. E. Montgomery-Downs (Eds.), *The Oxford handbook of infant, child, and adolescent sleep and behavior* (pp. 81–98). Oxford University Press.
- Taber, S. M. (2010). The veridicality of children's reports of parenting: a review of factors contributing to parent-child discrepancies. *Clinical Psychology Review*, *30*(8), 999–1010. doi: 10.1016/j.cpr.2010.06.014.
- Teti, D.M., Crosby, B. (2012). Maternal depressive symptoms, dysfunctional cognitions, and infant night waking: the role of maternal nighttime behavior. *Child Development*, *83*(3):939-53. doi: 10.1111/j.1467-8624.2012.01760.x.
- Thompson, R.A. & Meyer, S. (2007). Socialization of Emotion Regulation in the Family. In J. J. Gross, ed. *Handbook of Emotion Regulation*. New York, NY: The Guilford Press; 249-268.
- Tully, L.A. & Hunt, C. (2016). Brief Parenting Interventions for Children at Risk of Externalizing Behavior Problems: A Systematic Review. *Journal of Child and Family Studies*, *25*, 705–719. doi: 10.1007/s10826-015-0284-6.
- Tully, L.A. & Hunt, C. (2017). A randomized controlled trial of a brief versus standard group parenting program for toddler aggression. *Aggressive Behavior*, *43*(3), 291-303. doi: 10.1002/ab.21689.
- Varni, J.W., Thissen, D., Stucky, B.D., Liu, Y., Gorder, H., Irwin, D.E., DeWitt, E.M., Lai, J.S., Amtmann, D., DeWalt, D.A. (2012). PROMIS® Parent Proxy Report Scales: an item response theory analysis of the parent proxy report item banks. *Quality of Life Research*, *21*, 1223–1240. doi: 10.1007/s11136-011-0025-2.
- Webster-Stratton, C., & Reid, M. J. (2003) *The Incredible Years parents, teachers, and children training series: A multifaceted treatment approach for young children with conduct*



- problems*. In A. E. Kazdin & J. R. Weisz (Eds.), *Evidence-based psychotherapies for children and adolescents* (pp. 224–240). New York: Guilford Press.
- Wong, M. M., Brower, K. J., & Zucker, R. A. (2011). Sleep problems, suicidal ideation, and self-harm behaviors in adolescence. *Journal of Psychiatric Research*, *45*(4), 505–511. doi:10.1016/j.jpsychires.2010.09.005.
- Youngstrom, Eric & Loeber, Rolf & Stouthamer-Loeber, Magda. (2001). Patterns and Correlates of Agreement Between Parent, Teacher, and Male Adolescent Ratings of Externalizing and Internalizing Problems. *Journal of Consulting and Clinical Psychology*, *68*, 1038-50. doi: 10.1037/0022-006X.68.6.1038.

## VITA

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### SELECTED PUBLICATIONS AND PRESENTATIONS

Acosta, J., Parent, J., Hare, MS., DiMarzio, K., & Sisitsky, M., & McMakin, D.L. (2022). The Nighttime Parenting Scale: Assessing the impact of specific versus general parenting practices on youth's sleep health during a sensitive developmental stage. *Under review*.

Sullivan, A., Forehand, R., Acosta, J., Parent, J., Comer, J.S., Loiselle, R. & Jones, D. (2021). COVID-19 and the acceleration of remote BPT delivery now and in the future. *Cognitive and Behavioral Practice*. doi: 10.1016/j.cbpra.2021.06.012

DiMarzio, K., Peisch, V., Acosta, J., Dale, C., Gutierrez, J., & Parent, J. (2021). Keeping your coparent in mind: A longitudinal investigation of mindfulness in the family system. *Family Process*. doi: [10.1111/famp.12702](https://doi.org/10.1111/famp.12702).

McKee, L.G., DiMarzio, K., Parent, J., Dale, C.F., Acosta, J., & O’Leary, J. (2021). Profiles of emotion socialization across development and longitudinal associations with youth psychopathology. *Research on Child and Adolescent Psychopathology*. doi: 10.1007/s10802-021-00829-6.

Acosta, J., Parent, J., DiMarzio, K McMakin, D.L, McKee, L.G, & Dale, C.F. (2021). Longitudinal associations between parenting practices and youth sleep problems. *Journal of Behavioral and Developmental Pediatrics*. doi: 10.1097/DBP.0000000000000953.

DiMarzio, K., Parent, J., Forehand, R., Thigpen, J.C., Acosta, J., Dale, C., & Compas, B. (2021). Parent-child role confusion: Exploring the role of family processes in the context of parental depression. *Journal of Clinical Child and Adolescent Psychology*. doi 10.1080/15374416.2021.1894943

Acosta, J., Garcia, D., & Bagner, D.M. (2019). Parent-Child Interaction Therapy for children with and at risk for developmental delay: The role of sleep problems. *Journal of Developmental and Behavioral Pediatrics*, 40(3), 183-191. doi: 10.1097/DBP.0000000000000647.

Acosta, J., Garcia, D., McMakin, D. L., & Bagner, D. M. (2017). Sleep problems in children with developmental delay: Implications for parent training. In H. Agazzi (Chair), Parent-Child Interaction Therapy for pediatric health issues. Symposium conducted at the annual meeting of the American Psychological Association, Washington, D.C.

Cadet, G., Acosta, J., & Parent, J. (2021). Nighttime parenting and youth sleep problems during a sensitive developmental stage. 55<sup>th</sup> Annual Convention of the Association for Behavioral and Cognitive Therapies.

Acosta, J., Dale, C.F., & Parent, J. (2019). Longitudinal association between youth sleep problems and parenting practices: The role of youth developmental stage. Society for Research in Child Development Biennial Meeting, Baltimore, MD.

Dale, C.F., Acosta, J., McGregor, E., & Parent, J. (2019). The Longitudinal association between youth screen time and behavioral problems: The role of sleep disturbances. Society for Research in Child Development Biennial Meeting, Baltimore, MD.

Acosta, J., Dale, C.F., DiMarzio, K. & Parent, J. (2019). Youth sleep problems and parenting behaviors: The roles of warmth, behavioral control, and emotion socialization. International Convention of Psychological Science, Paris, France.