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Sleep and mental health: the moderating role of perceived adolescent-parent attachment

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ABSTRACT

Objective: The present study investigated whether the effects of sleep duration and quality on adolescent adjustment were moderated by perceived attachment to mothers and fathers.

Design: The study used a cross-sectional design.

Setting: Participants were recruited from small town and semirural communities in Alabama.

Participants: Participants were 106 adolescents (mean age = 13.61 years, SD = .73; 55% girls; 28% African American, 72% European American) and their parents.

Measurements: Sleep duration (minutes) and sleep quality (efficiency, number of long wake episodes) were derived using actigraphy, and subjective sleep/wake problems were derived with adolescent reports. Adolescents also reported on perceived attachment to mothers and fathers, internalizing symptoms, and self-esteem. Mothers and fathers reported on externalizing behaviors.

Results: Path model analyses indicated that perceived attachment to parents moderated relations between adolescents' sleep quality and their adjustment. For externalizing symptoms and self-esteem, adolescents at greatest risk for maladjustment were those who reported poor quality sleep (ie, more sleep/wake problems, lower sleep efficiency) coupled with less secure attachment to parents. Conversely, adolescents who experienced better actigraphy-based sleep quality (ie, higher sleep efficiency, fewer long wake episodes) in conjunction with more secure attachment to parents experienced the lowest levels of anxiety symptoms. Less secure attachment was associated with high levels of anxiety symptoms independent of sleep quality. Similar patterns of associations emerged for attachment to mothers and fathers.

Conclusions: Findings highlight the importance of examining the conjoint influence of sleep and adolescent-parent relationships toward explication of adolescent's mental health.

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Among typically developing youth, insufficient sleep and poor quality sleep are relatively common¹ and associated with a wide range of mental health problems.^{2,3} However, not all youth with sleep problems experience mental health difficulties, and explication of variables that can function to enhance vulnerability or protective factors in the link between sleep disturbances and adjustment are warranted. In addition to a growing body of work documenting relations between children's sleep and family functioning, an emerging literature suggests that family processes may function as moderators of risk and can alter the association between sleep problems and well-being in youth.⁴ Extending this literature, we examined

adolescents' perceptions of attachment to parents as moderators of the association between sleep and mental health (also referred to as *adjustment*), including internalizing and externalizing symptoms as well as self-esteem. *Attachment* is defined as adolescents' perceptions of trust, open communication, and lack of alienation with mothers and fathers and is thought to reflect security in these relationships. Several sleep parameters were derived: actigraphy-based sleep duration (minutes) and quality (efficiency, number of long wake episodes), and self-reported sleep/wake problems. In our study, *sleep problems* refer to shorter and poorer quality (lower efficiency, more frequent waking) sleep as derived from actigraphy, as well as subjective reports of more sleep/wake problems.

Sleep occurs in the context of the family, and associations between negative family interactions and poor sleep have been documented (for meta-analysis, see Bartel et al⁵). Because vigilance and sleep are incompatible, a safe and secure family environment

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facilitates sleep.⁶ Indeed, a secure attachment is associated with low levels of adjustment problems in youth (for meta-analyses, see Fearon et al⁷ and Madigan et al⁸), whereas an insecure attachment is linked with mental health problems.⁹ We propose that both sleep and attachment may interact and conjointly influence youths' mental health.¹⁰

An emerging literature is beginning to identify conditions under which sleep and family processes may interact to affect youth outcomes. In a study using an earlier wave of data from the same data set as the current study, lower perceived attachment security to mothers coupled with short or less efficient sleep predicted poor academic achievement in children.¹¹ In another study, maternal sensitivity, a correlate of attachment, during infancy was associated with lower adjustment problems in toddlerhood among children with longer but not shorter mother-reported sleep duration in infancy.¹² Collectively, these findings support the proposition that sleep and parent-child relationships may interact to predict children's adaptation.

Although the aforementioned studies highlight the role of sleep in the contexts of attachment and maternal sensitivity among younger children, we are not aware of studies that have examined such associations among adolescents.¹³ Furthermore, a majority of existing studies in the attachment literature focus primarily on mothers, with limited work on attachment to fathers.¹⁴ Yet, the inclusion of fathers is needed for a more comprehensive understanding of the link between parent-child relationships and youths' mental health.¹⁴ The few studies comparing relations between mother and father attachments or relationships and children's adjustment have yielded mixed findings, such that some have found similar patterns across mothers and fathers,^{15,16} whereas others have found null effects or effects for only 1 parent.¹¹ Our current assessments are likely to augment this literature.

The present study

We examined the moderating role of attachment to both mothers and fathers in the association between adolescent sleep and mental health. Consistent with dual-risk perspectives,¹⁷ in which an individual may have a vulnerability that increases risk or a protective factor that reduces risk, an insecure attachment may exacerbate the association between sleep problems and mental health difficulties and *vice versa*. It is also plausible that the benefits of a secure attachment would only be evident in the context of longer and/or better quality sleep. Such a pattern would reflect a protective-reactive moderating process, where a protective factor (attachment) confers benefits in the context of low but not high risk (sleep problems)¹⁸. These 2 patterns of moderation effects have emerged in the young literature examining sleep, family functioning, and development. Given the inconsistencies in this developing literature, we had no *a priori* hypothesis about the pattern of moderation effects.

Method

Participants

Data for the present study come from Time 3 (T3; collected in 2009) of a larger study (for additional details, see Kelly and El-Sheikh¹⁹). At the first wave (collected in 2004), participants were recruited from public elementary schools. Eligibility criteria included children who lived with both parents and had no diagnosis of a chronic illness, mental disability, attention deficit/hyperactivity disorder, or a diagnosed sleep disorder based on mothers' reports.

At T3, 113 youth participated. After the exclusion of youth without any data on primary study variables and those who did not report on attachments to both parents, the final analytic sample included 106 adolescents (mean_{age} = 13.61, SD = .73; 55% girls; 28% African Americans, 72% European Americans). At T3, 4% of participants

were diagnosed with attention deficit/hyperactivity disorder; 6%-7% reported having asthma or allergies, respectively. Data were not collected on sleep disorders.

Procedures

The study was approved by the university's institutional review board. Sleep data were collected with actigraphs worn on adolescents' nondominant wrists from bedtime to waking for 7 consecutive nights (Sunday to Saturday) during the regular school year, excluding holidays. Parents kept a sleep diary with records of the adolescents' bedtimes and wake times to corroborate actigraphy data²⁰ and were called daily to obtain this information. Nights during which medication was used for illnesses (most commonly allergies, asthma) were excluded from analyses. Families visited the laboratory, on average, 0.72 day (SD = 5.46) following the final day of wearing the actigraph; a majority (77.3%) came the day following the last day of wearing the actigraph, and 1 family came in 48 days later. In the laboratory, families completed questionnaires, and adolescents' weight (in kilograms) and height (in centimeters) were measured to compute body mass index (BMI).

Measures

Actigraphy-based sleep

Motionlogger Octagonal Basic actigraphs (Ambulatory Monitoring Inc, Ardsley, NY) were used to derive sleep parameters, and data were scored using Sadeh's algorithm.²¹ Seven nights of valid actigraphy data were available for 55% of the sample; 23% had 6 nights, 9% had 5 nights, and 13% had 4 nights or fewer. Missing data were due to: forgetting to wear the actigraph; use of medications; and, less frequently, malfunctioning equipment. Only sleep data for individuals with ≥ 5 nights of valid actigraphy data (87%) were included in analyses.²² Several sleep variables were derived by averaging data across all available nights²¹: sleep minutes (number of minutes scored as sleep between sleep onset and waking), sleep efficiency (percentage of epochs scored as sleep between sleep onset and offset), and long wake episodes (number of night wakings ≥ 5 minutes). Night-to-night stability was high for sleep minutes, sleep efficiency, and long wake episodes ($\alpha = .79-.90$).

Subjective sleep quality

Adolescents completed the Sleep/Wake Problems scale of the School Sleep Habits Survey.²³ Ten items measured how often youth had irregular sleep schedules, stayed up late at night, overslept in the morning, and had trouble going to sleep/staying asleep during the past 2 weeks. Items were rated on a 5-point scale (1 = never to 5 = every day/night; $\alpha = .70$).

Perceived attachment

Adolescents completed the Inventory of Parent and Peer Attachment²⁴ separately for mothers and fathers. The Inventory of Parent and Peer Attachment is a well-established measure that assesses the extent to which adolescents consider their parents to be sources of emotional security²⁴ and is comprised of 3 subscales: Trust (10 items; "My mother/father trusts my judgment"), Communication (9 items; "My mother/father helps me to talk about my difficulties"), and Alienation (6 items, reverse-scored; "Talking over my problems with my mother/father makes me feel ashamed or foolish"). Items were rated on a 5-point scale (1 = almost never or never true to 5 = almost always or always true). Consistent with prior literature,²⁵ scores across the 3 scales were averaged to create a single score of perceived attachment. High internal consistency was found; $\alpha = .91$ and $.88$ for mothers and fathers, respectively.

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