Journal of Anxiety Disorders 32 (2015) 66–72

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

Anxiety sensitivity and sleep-related problems in anxious youth

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ARTICLE INFO

Article history:
Received 3 September 2014
Received in revised form 19 March 2015
Accepted 24 March 2015
Available online 1 April 2015

Keywords:
Child
Child anxiety
Sleep
Anxiety sensitivity

ABSTRACT

Anxiety disorders constitute the most common mental health disturbance experienced by youth. Sleep-related problems (SRPs) are highly prevalent among anxious youth and encompass a variety of problems including nighttime fears, insomnia, and refusal to sleep alone. Given that chronic sleep disturbance is associated with a range of behavioral and physical problems in youth and predicts future psychopathology, it is important to elucidate the nature of SRPs in anxious youth. The present study investigated the relationship between sleep problems and anxiety sensitivity in a sample of 101 anxious youth, ages 6–17. Heightened anxiety sensitivity significantly predicted prolonged sleep onset latency across the sample, even after accounting for severity of anxiety, depression, and age. Results support previous research indicating that SRPs are common among anxious youth and suggest that anxiety sensitivity may play a particularly important role in sleep onset latency.

1. Introduction

Anxiety disorders constitute the most common class of mental health disturbance in childhood, affecting roughly 12–20% of youth (Achenbach, Howell, McConaughy, & Stranger, 1995; Gurley, Cohen, Pine, & Brook, 1996; Merikangas et al., 2010). Anxiety disorders are associated with pronounced functional impairments and reduced quality of life across the lifespan (e.g., Comer et al., 2010; Langley, Bergman, McCracken, & Piacentini, 2004), and importantly are linked with sleep-related problems (SRPs) in youth populations (Alfano, Ginsburg, & Kingery, 2007). Researchers have proposed a reciprocal relationship between sleep difficulties and anxiety, whereby disturbed sleep increases a child's vulnerability to developing anxiety, while anxiety, in turn, interferes with sleep (Dahl, 1996). Research suggests that the majority of anxious youth and their parents report significant sleep difficulties (Alfano, Pina, Zerr, & Villalta, 2010). For example, in one study, 88% of anxious children were reported to experience at least one SRP, and 55% experienced three or more (Alfano et al., 2007).

Quality sleep in childhood is critical for optimizing cognitive development, academic performance, and physical and emotional health. Inadequate sleep is associated with a range of difficulties in children, including daytime sleepiness, inattention, impulsivity, disruptive behavior, impaired cognitive functioning and academic performance, and social difficulties (Aronen, Paavonen, Fjällberg, Soininen, & Törrönen, 2000; Dahl, 1996; Fallone, Owens, & Deane, 2002; Fredriksen, Rhodes, Reddy, & Way, 2004; Mindell, 1999; Wolfson & Carskadon, 1998). Insufficient sleep can also negatively affect the immune system and metabolic processes, and has been associated with lower health-related quality of life in children (Hart, Palermo, & Rosen, 2005). Furthermore, persistent sleep difficulties in early childhood predict future psychopathology (Gregory, Eley, O'Connor, & Plomin, 2004; Gregory & O'Connor, 2002).

Despite emerging findings linking impaired sleep and pediatric anxiety, very little research has focused on patterns and predictors of SRPs in children presenting with formal anxiety disorders. Given the high prevalence of sleep difficulties in this population, it is important to empirically clarify the nature and correlates of SRPs in clinically anxious children. Despite overall impressive outcomes associated with established treatments for child anxiety (e.g., Beidel, Turner, & Morris, 2000; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008; Silverman, Pina, & Viswesvaran, 2008; Walkup et al., 2008), rates of only partial remission or non-response are also high (Ginsburg et al., 2011), and it may be that children with co-occurring anxiety and sleep difficulties require more tailored interventions specifically targeting sleep symptoms.

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http://dx.doi.org/10.1016/j.janxdis.2015.03.009
0887-6185/

Research elucidating patterns and predictors of SRPs in anxious youth is needed to inform such targeted and tailored treatment.

The very small but growing empirical work in this area suggests that anxiety sensitivity may be a key factor linking pediatric anxiety and SRPs. Anxiety sensitivity refers to the perception that physiological sensations related to anxiety are uncontrollable and are harmful or threatening (Reiss, Peterson, Gursky, & McNally, 1986). Individuals with high anxiety sensitivity are hypersensitive to and fearful of internal cues of anxiety, such as a racing heart, breathlessness, or stomach discomfort (Reiss & McNally, 1985). Anxiety sensitivity is a well-established risk factor for the development and maintenance of anxiety symptoms (e.g., Reiss, 1991; Silverman & Weems, 1998), and in other work researchers have proposed that heightened physiological arousal associated with anxiety sensitivity may contribute to difficulties initiating sleep (Morin, Rodrigue, & Ivers, 2003; Tang & Harvey, 2004). There is some empirical evidence supporting this hypothesis in adults, based on research with adults suffering with insomnia (Vincent & Walker, 2001). Babson, Trainor, Bunaciu, and Feldner (2008) further investigated the role of anxiety sensitivity in SRPs among adults and found that it moderated the relationship between sleep anticipatory anxiety and sleep onset latency. Specifically, for adult participants with high anxiety sensitivity, sleep anticipatory anxiety was significantly associated with longer sleep onset latency. Gregory and Eley (2005) investigated this phenomenon in a community sample of children, ages 8–11, using both parent- and child-report measures. Indeed, findings revealed that community children's anxiety sensitivity was a unique predictor of overall sleep problems. Research has yet to examine the link between anxiety sensitivity and SRPs in clinically referred anxious youth.

Much remains to be learned about the links between anxiety sensitivity and SRPs in youth diagnosed with formal anxiety disorders. The present study evaluated SRPs (i.e., sleep duration, total sleep disturbance, bedtime resistance, sleep onset latency, sleep anxiety, night wakings, parasomnias, sleep disordered breathing, and daytime sleepiness) in treatment-seeking anxious youth, and examined the extent to which anxiety sensitivity plays a unique role in sleep disturbance. Given previous research in the adult literature, we hypothesized that anxiety sensitivity predicts longer sleep onset latency in anxious youth. Since anxiety sensitivity is characterized by hyperawareness of bodily sensations, it is likely to be experienced while awake and when one's attention is not focused elsewhere. Therefore, individuals may be particularly vulnerable to focusing inward while lying in bed without external distractions. Children with longer sleep onset latency, in turn, would expectedly show shorter sleep duration, higher total sleep disturbance, greater bedtime resistance, and more daytime sleepiness. Lastly, given research showing that both SRPs and anxiety sensitivity vary by age (Alfano et al., 2007, 2010; Walsh, Stewart, McLaughlin, & Comeau, 2004), we further broke down analyses across younger and older youth, and also examined links between anxiety sensitivity and SRPs after controlling for age.

2. Methods

2.1. Participants

Study participants included 101 children and adolescents, ages 6–17 years, inclusive ($M = 11.17$, $SD = 2.67$), and their mothers, seeking outpatient treatment for childhood anxiety disorders at a large clinic in Boston, Massachusetts specializing in the treatment of childhood internalizing disorders. Children were included if they were diagnosed via the Anxiety Disorders Interview Schedule for Children and Parents (ADIS-C/P; Silverman & Albano, 1996) with a principal DSM-IV anxiety disorder diagnosis of social anxiety disorder, separation anxiety disorder, generalized anxiety disorder (GAD), specific phobia, obsessive-compulsive disorder, panic disorder, or anxiety disorder not otherwise specified. Children were excluded if they had a positive diagnosis of a pervasive developmental disorder, autism spectrum disorder, organic brain syndrome, mental retardation, or active suicidal ideation. Children were also excluded from the present study if they had a positive diagnosis of an organic or medical condition linked with established SRPs (e.g., restless leg syndrome, obstructive sleep apnea). For children on psychotropic medications, medication stabilization criteria had to be met prior to study inclusion (i.e., 1 month for benzodiazepines, 3 months for SSRIs or tricyclics). Twenty-three (22.8%) participants were taking a psychotropic medication at the time of the study including antidepressants ($n = 15$; 14.9%), stimulants ($n = 5$; 5.0%), benzodiazapines ($n = 2$; 2.0%), and atypical antipsychotics ($n = 1$; 1%). The sample was comprised of 51 males (50.5%) and 50 females (49.5%). Regarding race/ethnicity, 85% of the sample self-identified as Caucasian, 2% Latino, 1% African-American, 1% Asian, and 11% biracial or other. Participants met DSM-IV criteria for a principal diagnosis of either GAD ($n = 24$; 23.8%), separation anxiety disorder ($n = 14$; 13.9%), social anxiety disorder ($n = 10$; 9.9%), obsessive-compulsive disorder ($n = 11$; 10.9%), panic disorder ($n = 11$; 10.9%), specific phobia ($n = 11$; 10.9%), anxiety disorder not otherwise specified ($n = 16$; 15.8%), or co-principal anxiety diagnoses ($n = 4$, 4.0%). Thirty-seven percent ($n = 37$) of the sample was diagnosed with a comorbid disorder. The most common comorbid diagnoses included specific phobia ($n = 14$; 13.9%), GAD ($n = 13$; 12.9%), and social anxiety disorder ($n = 7$; 6.9%). Three participants (2.9%) were diagnosed with a comorbid mood disorder. No participating youth were diagnosed with PTSD.

2.2. Procedures

Study procedures were conducted under the approval of the Institutional Review Board of Boston University Charles River Campus. During a baseline diagnostic evaluation at the Center for Anxiety and Related Disorders, structured diagnostic interviews were conducted and self-report questionnaire data were collected from families who met inclusion criteria and consented to participate in research at the Center. All assessments were conducted at the Center for Anxiety and Related Disorders (CARD) at Boston University by doctoral students in clinical psychology specializing in the study of pediatric anxiety disorders. Following completion of the diagnostic interview, the evaluator collected all self-report forms from participants. All assessments were completed under the supervision of licensed clinical supervisors of the Child and Adolescent Fear and Anxiety Treatment Program at CARD.

2.3. Measures

2.3.1. Demographic data

A parent questionnaire was completed to provide descriptive information about the child and family.

2.3.2. Diagnostic status

The Anxiety Disorders Interview Schedule-Child and Parent Versions (ADIS-IV-C/P; Silverman & Albano, 1996) was used to assess the presence of DSM-IV anxiety disorders, mood disorders, and externalizing disorders of childhood, and to screen for other selected disorders (e.g., psychotic disorders, eating disorders, and somatization disorders). The ADIS-IV-C/P is a child adaptation of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown, DiNardo, & Barlow, 1994). The ADIS-IV-C/P includes visual prompts depicting thermometers to obtain child ratings of fear, worry, distress/interference, and occurrence of physical sensations. Parents and children are asked to provide ratings, ranging from