

Anxiety Disorders and Sleep in Children and Adolescents



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KEYWORDS

• Adolescent • Anxiety • Bidirectionality • Child • Internalizing • Sleep

KEY POINTS

- There seems to be a robust association between sleep and anxiety in children and adolescents.
- Evidence comes from cross-sectional and longitudinal studies, and community and clinical samples.
- Variation in the definitions and measurement methods used need to be considered when interpreting results.
- Potential mechanisms suggested include physiologic and psychological processes.

INTRODUCTION

Sleep problems are common in youth, with approximately 40% of children aged 4 to 11 years experiencing difficulties for at least brief periods.¹ In clinically anxious children, this proportion seems to be substantially higher. Alfano and colleagues² reported that 85% of a sample of anxiety-disordered 7 to 14 year olds had clinically significant sleep disturbance scores.

There are good reasons to focus on youth when considering the association between sleep difficulties and anxiety. First, it is known that disorders in adults typically begin early in life. For example, in anxiety-disordered adults, a substantial proportion (38%) was diagnosed with anxiety by age 15 years.³ Second, many studies have identified that the two problems frequently co-occur in pediatric populations.⁴ Third, a growing body of research has examined the directionality of the relationship, particularly the possibility that disturbed sleep in childhood may predict anxiety

later in life.⁵ If it is the case that sleep disturbance acts as an early risk factor for developing an anxiety disorder (or vice versa), then efforts can be made to identify those individuals at potential risk and who may benefit most from intervention.

This article considers associations between sleep disturbance and anxiety in children and adolescents. First, some important methodologic issues and inconsistencies are considered. This is followed by a summary of some key findings from the literature, from both cross-sectional and longitudinal research. A variety of potential mechanisms by which sleep and anxiety may be related have been suggested, and a selection of these are then outlined.

METHODOLOGIC ISSUES

There are some important considerations when interpreting work in this field that need to be outlined before introducing the literature: definition of sleep

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problems, measurement of sleep, and conceptualizations of anxiety.

Definition of Sleep Problems

The term “sleep-related problems” is commonly used in research in this field¹ and can encompass a variety of issues. These may include dyssomnias, such as symptoms of insomnia, which may include difficulty falling asleep, or frequent nighttime waking. Alternatively, they may refer to parasomnias, including sleepwalking or night terrors. Moreover, some research has focused on specific symptoms, such as sleep duration or sleep onset latency (ie, time taken to fall asleep), whereas others have taken a broader perspective and considered a pool of sleep variables. For example, Gregory and O’Connor⁶ investigated “total sleep problems,” a heterogeneous group of sleep difficulties providing a general sense of sleep quality. Furthermore, the classification of disorders may also vary depending on the diagnostic system being used (eg, the *Diagnostic and Statistical Manual of Mental Disorders*⁷ or the *International Classification of Sleep Disorders*⁸).

Measurement of Sleep

A second issue concerns the diverse range of methods used to assess sleep. For example, it is possible to use objective methods, such as actigraphy, a watch-like device that records movement and can be used to make inferences about sleep patterns, or polysomnography, often considered the gold-standard measurement technique. Furthermore, there are innovative new methods to assess sleep that may become more important in due course.⁹ Largely for reasons of cost and ease of use, most studies use subjective measures of sleep, such as questionnaires or sleep diaries. Some studies use single-item measures. For instance, the children and adolescents investigated by Alfano and colleagues² were asked if they have trouble sleeping and/or trouble waking in the morning; or a longitudinal French cohort study where parents were asked, “Does your child have sleep problems?.”¹⁰ Others use multi-term measures.¹¹ Gregory and colleagues¹² compared subjective (ie, sleep items from the Child Behaviour Checklist) and objective measures (ie, actigraphy, sleep laboratory) of sleep. Although there was some evidence of correspondence between methods (eg, the Child Behavior Checklist item “trouble sleeping” was associated with sleep diary and actigraphy-assessed sleep latency), many variables showed no association. The use of subjective and objective measures of

sleep is likely to offer the most comprehensive assessment of how an individual is sleeping.

A further consideration is the informant: sleep data may be provided by parents or the child/adolescent themselves. The methods used may contribute to the results observed: some studies have shown that a greater number of sleep problems are revealed using child-reported (as against parent-reported) data.^{13,14} This pattern seems to be reversed in clinical samples, with parents reporting more problems than the children themselves.^{2,15}

Conceptualization of Anxiety

Finally, there is similar heterogeneity in the measurement of anxiety. For example, sleep has been examined in relation to combined anxiety-depression^{6,16} or the broader construct “internalizing symptoms,” which includes depression and anxiety together with somatic complaints.¹⁰ Others have focused on specific anxiety subtypes, such as obsessive-compulsive disorder (OCD), or most commonly generalized anxiety disorder (GAD).^{2,15} Furthermore, as outlined later, samples may comprise community-based children and adolescents, or be drawn from clinically diagnosed anxious youth.

This article considers the results from studies that have used differing conceptualizations of sleep difficulties and anxiety, and a variety of assessment methods.

CONCURRENT ASSOCIATIONS

Sleep and Combined Anxiety/Depression

Several studies have explored the association between sleep problems and combined anxiety/depression symptomatology. This latter phenotype has been found to be associated with various aspects of disturbed sleep in nonclinical samples. For example, nightmares have been associated with emotional difficulties,¹⁷ whereas trouble sleeping was associated with parent-reported anxiety/depression in children at age 6 years and again at age 11.¹⁶

Sleep and Anxiety

Many studies have explored anxiety as distinct from depression, both as a general concept and in terms of specific subtypes. Gregory and colleagues¹⁴ investigated anxiety in relation to eight parent-reported components of sleep difficulties. Of these, bedtime resistance was associated with higher child-reported anxiety scores. However, child anxiety was not associated with the other seven aspects under consideration,

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