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Case Vignette

Karl is a 10-year-old boy with history of high-functioning autistic disorder, mild intellectual disability, and hypothyroidism who came to the clinic with his parents due to excessive morning sleepiness. He lives at home with his parents and 13-year-old sister.

He has a regular bedtime routine that he follows and is to be in bed at 8 PM. Detailed review of nightly routine reveals Karl following a schedule of getting dressed, brushing his teeth, saying prayers, and reading for 20 min. Parents reported that Karl was taking too long in completing his routine: he counted the times he brushed his teeth, and if for any reason he “didn’t do it right,” he started the process again, delaying his bedtime. Once in bed, he prayed, and his parents noticed he was also extending his prayer time. When asked about this, Karl reported he “has to” include more people in his prayers because “so many bad things happen to them” and he wanted to make sure they “get help.” After he was done reading, the lights were turned off and his parent would leave. Karl said he then tried to fall asleep, but the “bad things that happen keep coming.” He described images and information from the news that “come into my head, like pictures from the

TV news.” Although Karl was good at following rules and knows to stay in bed, he was scared and tired at the same time. Finally, Karl described his muscles as being in “knots,” which did not let him rest. At school, he was tired, experienced difficulty concentrating, and became irritable at times, which affected both his academic performance and peer interactions.

Karl’s parents reported they had the news on in the background while eating dinner and never expected him to understand or pay attention to it. In completing the psychiatric review of systems, Karl worried about “the world coming to an end” and his parents’ safety.

Karl was diagnosed with generalized anxiety disorder. He responded well to treatment for anxiety symptoms in the form of cognitive behavioral therapy that included relaxation techniques in combination with parent psychoeducation regarding discussion of current events with him. Karl’s sleep pattern then returned to normal.

Diagnosis of Psychiatric Illnesses in Intellectual Disabilities

Having an intellectual disability (ID) does not exempt anyone from psychiatric illness. Both children and adults with ID who have comorbid psychiatric illnesses often have their psychiatric symptoms miscategorized/misidentified as attributable to their ID such that they do not receive appropriate treatment. As such, they can fairly be considered an underserved population [1]. In a typically developing population, the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5)* is used to facilitate psychiatric diagnosis; however, many of the criteria listed there do not apply easily to individuals with ID, due to inability to communicate symptoms that often are subjective in nature and/or require detailed responses to very specific questions. As a

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result, the National Association for the Dually Diagnosed (NADD) in association with the American Psychiatric Association developed the *Diagnostic Manual: Intellectual Disability (DM-ID-2): A Textbook of Diagnosis of Mental Disorders in Persons with Intellectual Disability (DSM-ID)* [2]. This manual includes a description of each psychiatric disorder and lists symptoms adapted to individuals who might not otherwise be able to report accurately on criteria needed for diagnosis, including sleep-related symptoms. The use of appropriate criteria is crucial in order to accurately diagnose children with ID.

Medication Effects on Sleep

Psychoactive medications frequently used in individuals with neurodevelopmental disabilities might have undesirable effects in sleep that might be an issue of concern for caregivers. Excessive sleepiness is frequently observed with mood stabilizers (valproic acid, lithium carbonate), anti-seizure medications (lamotrigine), antipsychotics (risperidone, aripiprazole), benzodiazepines (diazepam, lorazepam, alprazolam), alpha-agonists (guanfacine, clonidine), and antidepressants (trazodone, sertraline). Sleep disruption, usually in the form of delayed sleep initiation, can occur with stimulant medications (amphetamines, methylphenidate). For example, in children with attention-deficit/hyperactivity disorder, the use of stimulant medication leads to a longer sleep latency, worse sleep efficiency, and shorter sleep duration. It is also important to consider the doses, the administration time, and the formulation of the stimulants administered (extended release versus immediate release) [1]. Judicious use of these drugs is paramount to avoid worsening sleep problems that these patients may already have.

How to Approach Sleep Disturbances in Children with Psychiatric Problems?

Symptoms seen in psychiatric disorders can be secondary to medical disorders and medications. For example, sleep apnea and thyroid abnormalities may lead to symptoms of ADHD and depression, respectively [3]. Symptoms can also be secondary to medications such as mania that can result from steroid administration. Treating the underlying psychiatric disorder may correct much of the sleep abnormality that's present. But, frequently, medications are used to help correct continued sleep disturbances.

Because sleep disturbances are present in many children with psychiatric problems, their identification and treatment are important to improve children's quality of life and clinical outcomes (Table 24.1). The management of primary sleep disorders is very important as they can occur in addition to psychiatric problems [5]. Conversely, treatment of a primary psychiatric disorder may actually improve a child's sleep disturbance and should be undertaken. Sleep hygiene recommendations and behavioral interventions are at the heart of management. Behavioral interventions in children who have problems with initiation of sleep (especially with need for co-sleeping) such as firm schedules or modification of the hour to go to bed, depending on the case; rewards; establishment of limits; avoidance of scary movies or television shows; as well as instillation of positive thoughts and routines are all helpful [5–7]. Discipline and structure are very relevant. Breathing exercises and relaxation techniques can also be helpful [8].

In terms of medication specifically for sleep, it is important to remember that there are no US Food and Drug Administration (FDA)-approved drugs for insomnia in children. Moreover, effects vary: while some antidepressants

Table 24.1 Psychiatric diagnoses in DSM-5 and pertinent sleep abnormalities [4]

Disorder	DSM-5 diagnostic criteria (sleep abnormalities are bolded)
Schizophrenia	<p>Criterion A:</p> <ol style="list-style-type: none"> 1. Delusions 2. Hallucinations 3. Disorganized speech (e.g., frequent derailment or incoherence) 4. Grossly disorganized or catatonic behavior 5. Negative symptoms (i.e., diminished emotional expression or avolition) <p>At least two of the five symptoms must be present for at least 1 month. One of the two symptoms must be delusions, hallucinations, or disorganized speech</p>
Tourette's disorder	<p>Have two or more motor tics (e.g., blinking or shrugging the shoulders) and at least one vocal tic (e.g., humming, clearing the throat, or yelling out a word or phrase), although they might not always happen at the same time</p> <p>Have had tics for at least a year</p> <p>The tics can occur many times a day (usually in bouts) nearly every day, or off and on</p> <p>Have tics that begin before he or she is 18 years of age</p> <p>Have symptoms that are not due to taking medicine or other drugs or due to having another medical condition (e.g., seizures, Huntington disease, or postviral encephalitis)</p>

Table 24.1 (continued)

Disorder	DSM-5 diagnostic criteria (sleep abnormalities are bolded)
Obsessive-compulsive disorder	A. Presence of obsessions, compulsions, or both: Obsessions are defined by (1) and (2): (1) Recurrent and persistent thoughts, urges, or impulses that are experienced, at some time during the disturbance, as intrusive and unwanted, and that in most individuals cause marked anxiety or distress (2) The individual attempts to ignore or suppress such thoughts, urges, or images or to neutralize them with some other thought or action (i.e., by performing a compulsion)
	Compulsions are defined by (1) and (2): (1) Repetitive behaviors (e.g., handwashing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly (2) The behaviors or mental acts are aimed at preventing or reducing anxiety or distress or preventing some dreaded event or situation; however, these behaviors or mental acts are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive
	Note: Young children may not be able to articulate the aims of these behaviors or mental acts
	B. The obsessions or compulsions are time-consuming (e.g., take more than 1 h/day) or cause clinically significant distress or impairment in social, occupational, or other important areas of functioning
	C. The obsessive-compulsive symptoms are not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition
Post-traumatic stress disorder	Criterion A (one required): the person was exposed to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in the following way(s): Direct exposure Witnessing the trauma Learning that a relative or close friend was exposed to a trauma Indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics)
	Criterion B (one required): the traumatic event is persistently re-experienced, in the following way(s): Intrusive thoughts Nightmares Flashbacks Emotional distress after exposure to traumatic reminders Physical reactivity after exposure to traumatic reminders
	Criterion C (one required): avoidance of trauma-related stimuli after the trauma, in the following way(s): Trauma-related thoughts or feelings Trauma-related reminders
	Criterion D (two required): negative thoughts or feelings that began or worsened after the trauma, in the following way(s): Inability to recall key features of the trauma Overly negative thoughts and assumptions about oneself or the world Exaggerated blame of self or others for causing the trauma Negative affect Decreased interest in activities Feeling isolated Difficulty experiencing positive affect
	Criterion E (two required): trauma-related arousal and reactivity that began or worsened after the trauma, in the following way(s): Irritability or aggression Risky or destructive behavior Hypervigilance Heightened startle reaction Difficulty concentrating Difficulty sleeping
	Criterion F (required): symptoms last for more than 1 month
	Criterion G (required): symptoms create distress or functional impairment (e.g., social, occupational)
	Criterion H (required): symptoms are not due to medication, substance use, or other illnesses

(continued)

Table 24.1 (continued)

Disorder	DSM-5 diagnostic criteria (sleep abnormalities are bolded)
Bipolar disorder	<p>For a diagnosis of bipolar disorder, it is necessary to meet the following criteria for a manic episode which may have been preceded by and may be followed by hypomanic or major depressive episodes</p> <p>Manic episode: a distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased goal-directed activity or energy lasting at least 1 week and present most of the day, nearly every day</p> <p>During the period of mood disturbance and increased energy or activity three (or more) of the following symptoms are present:</p> <ul style="list-style-type: none"> Inflated self-esteem and grandiosity Decreased need for sleep More talkative than usual or pressure to keep talking Flight of ideas or subjective experience that thoughts are racing Distractibility Increase in goal-directed activity Excessive involvement in activities that have high potential for painful consequences
Separation anxiety disorder	<p>Developmentally inappropriate and excessive fear or anxiety concerning separation from those to whom the individual is attached, as evidenced by at least three of the following:</p> <ol style="list-style-type: none"> 1. Recurrent excessive distress when anticipating or experiencing separation from home or from major attachment figures 2. Persistent and excessive worry about losing major attachment figures or about possible harm to them, such as illness, injury, disasters, or death 3. Persistent and excessive worry about experiencing an untoward event (e.g., getting lost, being kidnapped, having an accident, becoming ill) that causes separation from a major attachment figure 4. Persistent reluctance or refusal to go out, away from home, to school, to work, or elsewhere because of fear of separation 5. Persistent and excessive fear of or reluctance about being alone or without major attachment figures at home or in other settings 6. Persistent reluctance or refusal to sleep away from home or to go to sleep without being near a major attachment figure 7. Repeated nightmares involving the theme of separation 8. Repeated complaints of physical symptoms (e.g., headaches, stomachaches, nausea, vomiting) when separation from major attachment figures occurs or is anticipated
Major depressive disorder	<p>Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure</p> <p>Note: Do not include symptoms that are clearly attributable to another medical condition</p> <ol style="list-style-type: none"> 1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: in children and adolescents, can be irritable mood) 2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation) 3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. (Note: in children, consider failure to make expected weight gain) 4. Insomnia or hypersomnia nearly every day 5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down) 6. Fatigue or loss of energy nearly every day 7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick) 8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others) 9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

(serotonin reuptake inhibitors such as fluoxetine) can have negative effects on sleep patterns, causing insomnia or hypersomnia, trazodone, in comparison, appears to be more effective improving insomnia [9, 10]. Other drugs such as mirtazapine and ramelteon may be effective, but data on their use are scarce [11]. Melatonin may be well tolerated and

effective in some children with autism spectrum disorders and neurodevelopmental disabilities, improving sleep duration and decreasing sleep latency [11, 12]. Hypnotics should probably be avoided due to lack to data in children [6]. Indeed, the actual success of many interventions for sleep is unknown due to very limited data [6].

Table 24.2 Tools to assess pediatric sleep

Tool	Considerations
Clinical interview	Potential iatrogenic effects of stimulants and selective reuptake inhibitors
	Responses to bedtime resistance, inconsistent household routines and bedtimes, co-sleeping, caffeine consumption, and evening use of electronic media including computers and mobile phones
Sleep diaries	To be used to calculate key sleep variables such as average sleep-onset latency, variability in sleep times, sleep efficiency, and time spent awake after sleep onset
	Questions to ask include: Sleep initiation Sleep maintenance Middle-of-the-night awakening Nightmares Early awakening and daytime sleepiness The presence and timing of daytime naps should be documented, especially in younger and nonverbal children Parental expectations of total amount of sleep Any perceived changes in mood and energy
	To be obtained from parents and other caregivers including school personnel, daycare providers, and babysitters
Standardized questionnaires	Several questionnaires available from the perspectives of both parent and child
	Parent report <i>The Children's Sleep Habits Questionnaire</i> [13] <i>Sleep Disturbance Scale for Children</i> [14]
	Child report <i>Pediatric Daytime Sleepiness Scale</i> [15] <i>Sleep Self-Report</i> [16]

Data from Alfano and Gamble [17]

Evaluation of Sleep Abnormalities Frequently Seen in Children with Psychiatric Disorders

When evaluating sleep disorders in patients who are typically developing and in children with neurodevelopmental disorders, in addition to the workup for sleep disorders detailed in the earlier chapters in this book, the following steps can be added. The psychiatric history of family members should be assessed. The child should be screened for psychiatric disorders that can present with sleep abnormalities, since sleep abnormalities can result from a primary psychiatric disorder that is comorbid with a neurodevelopmental disorder. Drug and alcohol abuse can also interfere with sleep quality, and although there is little research literature about this, having a developmental disability doesn't preclude substance use or abuse, which should always be queried as part of a mental health evaluation. Sleep complaints

are often present in psychiatric illness, not necessarily as part of formal diagnostic criteria but often as a manifestation of another symptom (i.e., fear of the dark in anxiety). Therefore, a psychiatric review of systems should include details of duration and quality of sleep. Questions about sleep initiation, maintenance, middle-of-the-night awakening, nightmares, early awakening, and daytime sleepiness are important. The presence and timing of daytime naps should be documented, especially in younger and nonverbal children. Parental expectations of total amount of sleep should also be part of the evaluation. Information should be obtained from the child, parents, and other caregivers including school personnel, daycare providers, and babysitters. A sleep journal is highly recommended and should also include any perceived changes in mood and energy (Table 24.2).

Mood Disorders

Sleep is part of the diagnostic criteria of depression and bipolar disorder; as such, details about its quality and quantity are always part of the psychiatric review of systems (see Table 24.1). These criteria apply to both children and adult regardless of their developmental functioning [4].

Prevalence of major depressive disorder (MDD) from early childhood to adolescence ranges from 1% to 8% [18]. MDD as defined by the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V)* lists insomnia or hypersomnia in its symptom criteria in addition to depressed mood, loss of interest in pleasurable activities, weight changes, psychomotor agitation or retardation, fatigue, feelings of worthlessness, diminished concentration, and recurrent thoughts of death or suicide [4]. Symptoms specific to children include irritability and excessive mood reactivity; however, MDD presents in children in a similar fashion to older patients. According to the DSM-5 criteria used for the diagnosis of major depressive disorder, insomnia or hypersomnia are occurring nearly every day [4]. Interestingly, sleep disturbances correlate with other symptomatology. For instance, agitation and insomnia go together just as hypersomnia tends to be associated with fatigue, hopelessness, and helplessness [19]. Furthermore, there is an impairment in sleep architecture, such as decrease in REM latency and other REM sleep abnormalities [20]. Also, sleep disturbances early in life correlate with the risk of developing MDD later in life [21].

Further, sleep problems correlate not only with symptoms and risk of complications but also with poor response to therapy [22]. In fact, adult patients who attempt suicide are more commonly affected by sleep disturbances [23, 24], and insomnia may be a risk factor for suicidal thoughts [25].

The prevalence rate of pediatric bipolar I and II disorders is difficult to establish. DSM-V lists a combined prevalence rate of 1.8%, for the pediatric population [4]. The mean onset

for the first manic, hypomanic, or major depressive episode is approximately 18 years for bipolar I [4]. Decreased need for sleep is a very common complaint from parents with children with neurodevelopmental disabilities but also of typically developing adolescents with bipolar disorder. Often parents identify sleep disruption retrospectively as a prodromal symptom of bipolar disorder [26, 27]. Bipolar disorder is classified in the DSM-5 as bipolar I disorder and bipolar II depending on the presence of mania or hypomania. Both can present with disordered sleep (decrease need of sleep, e.g., feels rested after only 3 h of sleep) which must be present as a criteria to fulfill diagnosis. With the development of DSM-V, the definition of bipolar disorder is very clear in adults, and the diagnosis in children and adolescents requires taking into account the child's developmental level to better identify the criteria needed for diagnosis. An example of this might be the presence of "grandiosity" as part of mania and the expression of this abnormality of thought being different in a full functioning adult versus a 5-year-old child in which fantastic role-play is normal; the same applies for sleep patterns. Increased sleep-onset latency, multiple episodes of awakening, and decreased need for sleep are also commonly seen in children with bipolar disorder [28, 29]. While acute manic episodes are characterized by decreased need for sleep, it has also been reported that sleep deprivation might play a part in relapse of mania [20]. In fact, sleep disturbances occur in the large majority of children during both manic and hypomanic episodes [30]. During depressive episodes, insomnia and hypersomnia are present [4, 31].

Very few studies have been published regarding characteristics of sleep in children with bipolar disorder. The findings of these studies suggest that children with this condition have more stage 1 sleep and a trend toward reduced stage 4 sleep [32]; lower sleep efficiency, less REM sleep, and a trend toward more awakenings [33]; and decreased sleep efficiency and duration, as well as increased nocturnal activity [34] and longer slow-wave sleep [35]. Sleep disturbances are also present in children of parents with bipolar disorder when compared with controls [36].

Anxiety Disorders

Sleep disorders are seen often in patients with anxiety disorders, and as these are among the most common psychiatric disturbances in children, adolescents, and young adults, it can be inferred how relevant is to recognize and address this problem. Prevalence of anxiety in children and adolescents is 10–20% [37]. The sleep complaints reported in the literature vary according to development, ranging from bedtime refusal, separation anxiety, resistance to sleeping alone, and fear of the dark (directly related to sleep and bedtime rou-

tine) to poor academic performance, daytime sleepiness, and irritability (secondary to poor sleep) [31]. Severity of anxiety correlates to functional impairment and sleep disruption and predicts escalating anxiety symptoms [38, 39]. As with MDD, persistent sleep disorders at an early age correlate with the development of anxiety disorders in adulthood [21].

The most common anxiety disorder in children is separation anxiety disorder. Insomnia, nightmares, and refusal to sleep alone are all associated with separation anxiety and as such should be considered in these children [40].

Post-traumatic Stress Disorder

Post-traumatic stress disorder (PTSD) is also associated with sleep disturbances. PTSD is becoming a more recognized health problem in our youth. PTSD consists in the development of symptoms following exposure to one or more traumatic events. The clinical presentation varies from fear-based responses to dysphoric mood (DSM-V) [41]. Although now a separate category in DSM-5 from anxiety disorders, PTSD is highly related to and usually comorbid with anxiety. It now belongs to a category named "Trauma and Stressor-related Disorders" [42]. In children, for example, a child suffering from physical abuse can experience fragmentation on his sleep and nightmares [43].

Obsessive-Compulsive Disorder

Children suffering from obsessive-compulsive disorder (OCD) may also be at high risk for sleep disturbances due to anxiety. Shorter total sleep times often characterize children with OCD [35]. OCD-related behavior can interfere with bedtime routines in young children as in the case described above, the need for completing rituals (counting, following a certain order) and the presence of intrusive thoughts of anxious nature keep them awake, and if those thoughts are obsessive and distressing in nature, the diagnosis changes from GAD to OCD [40, 44]. In fact, it appears that in these children, the presence of depression can play an important role in their sleep health [45].

Tourette Syndrome

Ghosh et al. reported on 123 young patients with Tourette syndrome (TS) with and without attention-deficit/hyperactivity disorder (ADHD) aging 21 years and under [46]. Sleep was a frequent issue, with 65% of children in the Tourette-only group and 64% of the group with comorbid ADHD having symptoms suggestive of a sleep disorder [46]. Insomnia was

more common in those with TS and ADHD than in TS-only, but even in the TS-only group, primary insomnia was the most common sleep disorder, affecting 32% [46]. Sleep talking also appears to be common in patients with TS [47]. Sleep disturbances in these patients may also be caused by intrusive thoughts and other emotional disturbances [48, 49].

Schizophrenia

Due to the typical age of onset of schizophrenia in adolescence or young adulthood, it is not a common problem in children. However, sleep disturbances are quite common in patients with schizophrenia, especially insomnia [49]. Individuals with schizophrenia have problems with sleep initiation and maintenance. In patients with schizophrenia, obstructive sleep apnea can be seen as a consequence of the use of neuroleptic drugs, given that these drugs can cause significant weight gain, a risk factor for the development of sleep apnea [50].

Neurodevelopmental Disabilities

Sleep disturbances often are present in children with neurodevelopmental disabilities (as high as 86%) but can be misunderstood and underdiagnosed [11, 51]. Some children who are blind have increased susceptibility to sleep problems due to their difficulty recognizing the changes in light that characterize day and night [11].

Conclusions

Having a neurodevelopmental disability of any kind does not exempt a child from having a comorbid psychiatric disorder. Symptoms that reflect impairment in quality of life should be reviewed carefully and addressed. The identification and treatment of comorbid psychiatric conditions are necessary to address disordered sleep. A psychiatric diagnosis in a non-verbal person is certainly more complicated than in the typically developing population and requires obtaining collateral information from parents or other caregivers, as full participation in a review of systems by the affected individual might not be possible. This should include a review of the daily routine, details of sleep schedule, medical history, and any medications being administered. More studies are needed in children and adults with neurodevelopmental disorders, including longitudinal studies that incorporate clinical interviews, sleep diaries, questionnaires, and multiple informants. These will allow for creation of effective practice guidelines as to how to assess for psychiatric disorders in individuals with sleep symptoms.

References

1. Kidwell KM, Van Dyk TR, Lundahl A, Nelson TD. Stimulant medications and sleep for youth with ADHD: a meta-analysis. *Pediatrics*. 2015;136(6):1144–53.
2. Fletcher RJ, Barnhill J, Cooper SA, editors. *DM-ID-2: diagnostic manual, intellectual disability: a textbook of diagnosis of mental disorders in persons with intellectual disability*. 2nd ed. Kingston: NADD Press; 2016.
3. Volkow ND, Swanson JM. Clinical practice: adult attention deficit-hyperactivity disorder. *N Engl J Med*. 2013;369(20):1935–44.
4. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Arlington: American Psychiatric Publishing; 2013.
5. Singh K, Zimmerman AW. Sleep in autism spectrum disorder and attention deficit hyperactivity disorder. *Semin Pediatr Neurol*. 2015;22(2):113–25.
6. Ramtekkar U, Ivanenko A. Sleep in children with psychiatric disorders. *Semin Pediatr Neurol*. 2015;22(2):148–55.
7. Harvey AG, Payne S. The management of unwanted pre-sleep thoughts in insomnia: distraction with imagery versus general distraction. *Behav Res Ther*. 2002;40(3):267–77.
8. Ollendick TH, Hagopian LP, Huntzinger RM. Cognitive-behavior therapy with nighttime fearful children. *J Behav Ther Exp Psychiatry*. 1991;22(2):113–21.
9. Armitage R, Emslie G, Rintelmann J. The effect of fluoxetine on sleep EEG in childhood depression: a preliminary report. *Neuropsychopharmacology*. 1997;17(4):241–5.
10. Dorsey CM, Lukas SE, Cunningham SL. Fluoxetine-induced sleep disturbance in depressed patients. *Neuropsychopharmacology*. 1996;14(6):437–42.
11. Hollway JA, Aman MG. Pharmacological treatment of sleep disturbance in developmental disabilities: a review of the literature. *Res Dev Disabil*. 2011;32(3):939–62.
12. Rossignol DA, Frye RE. Melatonin in autism spectrum disorders: a systematic review and meta-analysis. *Dev Med Child Neurol*. 2011;53(9):783–92.
13. Owens JA, Spirito A, McGuinn M. The Children's Sleep Habits Questionnaire (CSHQ): psychometric properties of a survey instrument for school-aged children. *Sleep*. 2000;23(8):1043–51.
14. Bruni O, Ottaviano S, Guidetti V, Romoli M, Innocenzi M, Cortesi F, Giannotti F. The Sleep Disturbance Scale for Children (SDSC). Construction and validation of an instrument to evaluate sleep disturbances in childhood and adolescence. *J Sleep Res*. 1996;5(4):251–61.
15. Drake C, Nickel C, Burduvali E, Roth T, Jefferson C, Pietro B. The Pediatric Daytime Sleepiness Scale (PDSS): sleep habits and school outcomes in middle-school children. *Sleep*. 2003;26(4):455–8.
16. Owens JA, Maxim R, Nobile C, McGuinn M, Msall M. Parental and self-report of sleep in children with attention-deficit/hyperactivity disorder. *Arch Pediatr Adolesc Med*. 2000;154(6):549–55.
17. Alfano CA, Gamble AL. The role of sleep in childhood psychiatric disorders. *Child Youth Care Forum*. 2009;38(6):327–40.
18. Birmaher B, Brent D, AACAP Work Group on Quality Issues. Practice parameter for the assessment and treatment of children and adolescents with depressive disorders. *J Am Acad Child Adolesc Psychiatry*. 2007;46(11):1503–26.
19. Liu X, Buysse DJ, Gentzler AL, Kiss E, Mayer L, Kapornai K, Kovacs M. Insomnia and hypersomnia associated with depressive phenomenology and comorbidity in childhood depression. *Sleep*. 2007;30(1):83–90.
20. Harvey AG, Talbot LS, Gershon A. Sleep disturbance in bipolar disorder across the lifespan. *Clin Psychol Sci Pract*. 2009;16(2):256–77.

21. Gregory AM, Rijdsdijk FV, Lau JY, Dahl RE, Eley TC. The direction of longitudinal associations between sleep problems and depression symptoms: a study of twins aged 8 and 10 years. *Sleep*. 2009;32(2):189–99.
22. Manglick M, Rajaratnam SM, Taffe J, Tonge B, Melvin G. Persistent sleep disturbance is associated with treatment response in adolescents with depression. *Aust N Z J Psychiatry*. 2013;47(6):556–63.
23. Barbe RP, Williamson DE, Bridge JA, Birmaher B, Dahl RE, Axelson DA, Ryan ND. Clinical differences between suicidal and nonsuicidal depressed children and adolescents. *J Clin Psychiatry*. 2005;66(4):492–8.
24. Franić T, Kralj Ž, Marčinko D, Knez R, Kardum G. Suicidal ideations and sleep-related problems in early adolescence. *Early Interv Psychiatry*. 2014;8(2):155–62.
25. Pigeon WR, Piquart M, Conner K. Meta-analysis of sleep disturbance and suicidal thoughts and behaviors. *J Clin Psychiatry*. 2012;73(9):e1160–7.
26. Duffy A, Alda M, Crawford L, Milin R, Grof P. The early manifestations of bipolar disorder: a longitudinal prospective study of the offspring of bipolar parents. *Bipolar Disord*. 2007;9(8):828–38.
27. Shaw JA, Egeland JA, Endicott J, Allen CR, Hostetter AM. A 10-year prospective study of prodromal patterns for bipolar disorder among Amish youth. *J Am Acad Child Adolesc Psychiatry*. 2005;44(11):1104–11.
28. Staton D. The impairment of pediatric bipolar sleep: hypotheses regarding a core defect and phenotype-specific sleep disturbances. *J Affect Disord*. 2008;108(3):199–206.
29. Roybal DJ, Chang KD, Chen MC, Howe ME, Gotlib IH, Singh MK. Characterization and factors associated with sleep quality in adolescents with bipolar I disorder. *Child Psychiatry Hum Dev*. 2011;42(6):724–40.
30. Kowatch RA, Youngstrom EA, Danielyan A, Findling RL. Review and meta-analysis of the phenomenology and clinical characteristics of mania in children and adolescents. *Bipolar Disord*. 2005;7(6):483–96.
31. Ivanenko A, Crabtree VM, O'Brien LM, Gozal D. Sleep complaints and psychiatric symptoms in children evaluated at a pediatric mental health clinic. *J Clin Sleep Med*. 2006;2(1):42–8.
32. Rao U, Dahl RE, Ryan ND, Birmaher B, Williamson DE, Rao R, Kaufman J. Heterogeneity in EEG sleep findings in adolescent depression: unipolar versus bipolar clinical course. *J Affect Disord*. 2002;70(3):273–80.
33. Mehl RC, O'Brien LM, Jones JH, Dreisbach JK, Mervis CB, Gozal D. Correlates of sleep and pediatric bipolar disorder. *Sleep*. 2006;29(2):193–7.
34. Faedda G, Teicher M. Objective measures of activity and attention in the differential diagnosis of childhood psychiatric disorders. *Essent Psychopharmacol*. 2005;6(5):239–49.
35. Nutt D, Wilson S, Paterson L. Sleep disorders as core symptoms of depression. *Dialogues Clin Neurosci*. 2008;10(3):329.
36. Jones SH, Hare DJ, Evershed K. Actigraphic assessment of circadian activity and sleep patterns in bipolar disorder. *Bipolar Disord*. 2005;7(2):176–86.
37. Beesdo K, Knappe S, Pine DS. Anxiety and anxiety disorders in children and adolescents: developmental issues and implications for DSM-V. *Psychiatr Clin N Am*. 2009;32(3):483–524.
38. Chase RM, Pincus DB. Sleep-related problems in children and adolescents with anxiety disorders. *Behav Sleep Med*. 2011;9(4):224–36.
39. McMakin DL, Alfano CA. Sleep and anxiety in late childhood and early adolescence. *Curr Opin Psychiatry*. 2015;28(6):483–9.
40. Alfano CA, Pina AA, Zerr AA, Villalta IK. Pre-sleep arousal and sleep problems of anxiety-disordered youth. *Child Psychiatry Hum Dev*. 2010;41(2):156–67.
41. Brown TSH, Belcher HM, Accardo J, Minhas R, Briggs EC. Trauma exposure and sleep disturbance in a sample of youth from the National Child Traumatic Stress Network Core Data Set. *Sleep Health*. 2016;2(2):123–8.
42. Glod CA, Teicher MH, Hartman CR, Harakal T. Increased nocturnal activity and impaired sleep maintenance in abused children. *J Am Acad Child Adolesc Psychiatry*. 1997;36(9):1236–43.
43. Sadeh A, McGuire JP, Sachs H, Seifer R, Tremblay A, Civita R, Hayden RM. Sleep and psychological characteristics of children on a psychiatric inpatient unit. *J Am Acad Child Adolesc Psychiatry*. 1995;34(6):813–9.
44. Rapoport J, Elkins R, Langer DH, Sceery W, Buchsbaum MS, Gillin JC, et al. Childhood obsessive-compulsive disorder. *Am J Psychiatry*. 1981;138(12):1545–54.
45. Díaz-Román A, Perestelo-Pérez L, Buela-Casal G. Sleep in obsessive-compulsive disorder: a systematic review and meta-analysis. *Sleep Med*. 2015;16(9):1049–55.
46. Ghosh D, Rajan PV, Das D, Datta P, Rothner AD, Erenberg G. Sleep disorders in children with Tourette syndrome. *Pediatr Neurol*. 2014;51(1):31–5.
47. Ghanizadeh A, Mosallaei S. Psychiatric disorders and behavioral problems in children and adolescents with Tourette syndrome. *Brain Dev*. 2009;31(1):15–9.
48. Modafferi S, Stornelli M, Chiarotti F, Cardona F, Bruni O. Sleep, anxiety and psychiatric symptoms in children with Tourette syndrome and tic disorders. *Eur J Paediatr Neurol*. 2016;20(5):696–703.
49. Cohrs S. Sleep disturbances in patients with schizophrenia. *CNS Drugs*. 2008;22(11):939–62.
50. Jaffe F, Markov D, Doghramji K. Sleep-disordered breathing: in depression and schizophrenia. *Psychiatry (Edgmont)*. 2006;3(7):62.
51. Jan JE, Bax MC, Owens JA, Ipsiroglu OS, Wasdell MB. Neurophysiology of circadian rhythm sleep disorders of children with neurodevelopmental disabilities. *Eur J Paediatr Neurol*. 2012;16(5):403–12.