Cognitive Behavioral Therapy for Insomnia in School-Aged Children and Adolescents

Julia Dewald-Kaufmann, PhD[a,b,*], Ed de Bruin, PhD[c], Gradisar Michael, PhD[d]

KEYWORDS

- Insomnia • Children • Adolescents • Sleep problems
- Cognitive behavioral therapy for insomnia (CBT-i)

KEY POINTS

- Insomnia is a common sleep disorder in school-aged children and adolescents with severe consequences on daytime functioning.
- Diagnostic tools should include clinical interviews, questionnaires, and sleep diaries. Objective sleep assessments (actigraphy, polysomnography) can additionally be used, especially when other sleep disorders (eg, sleep apnea) may be suspected.
- Cognitive behavioral therapy for insomnia (CBT-i) seems to be effective in school-aged children and adolescents; however, only a limited number of randomized controlled trials exist.
- More replication research, especially in clinical settings, is needed to systematically evaluate the effects of CBT-i in children and adolescents.

INTRODUCTION

One of the most prevalent sleep disorders in children and adolescents is "insomnia," which can be briefly described as problems with initiating and/or maintaining sleep with associated daytime consequences. These are typical insomnia symptoms, and when experienced for long enough and when they interfere with an important area of the young person's life (eg, schooling), then a diagnosis of an insomnia disorder may be warranted. The prevalence rates of insomnia symptoms are high and range up to 30% in children[1–3] and from ~ 40%[4] to 66%[5] in adolescents, whereas prevalence rates for the full insomnia disorder diagnosis vary between ~ 9% and 23%.[4,6–8] Differences in prevalence rates may be explained by differences in assessment methods and definitions of "sleep problems" and "insomnia" (eg, assessment of symptoms or sleep disorders, using different diagnostic classifications).[6,9] If not treated, insomnia symptoms during childhood and adolescence are often persistent and constitute a risk factor for negative daytime consequences, including cognitive deficits, behavioral problems, school problems, somatic problems, and emotional problems.[10–15] Although an insomnia disorder includes both problems with initiating and/or maintaining sleep, school-aged children and adolescents mostly suffer from

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[a] Department of Psychiatry and Psychotherapy, University Hospital, LMU Munich, Nussbaumstr. 7, Munich 80336, Germany; [b] Hochschule Fresenius, University of Applied Sciences, Infanteriestr. 11a, Munich 80797, Germany; [c] Research Institute of Child Development and Education, University of Amsterdam, Nieuwe Achtergracht 127, Amsterdam 1018 WS, the Netherlands; [d] School of Psychology, Flinders University, GPO Box 2100, Adelaide 5001, South Australia

* Corresponding author. Department of Psychiatry and Psychotherapy, University Hospital, LMU Munich, Nussbaumstr. 7, Munich 80336, Germany.

E-mail address: Julia.dewald-kaufmann@hs-fresenius.de

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problems with initiating sleep. In addition, children often have behavioral difficulties including bedtime resistance and reluctance/refusal to sleep alone.[1,16]

In the second edition of the International Classification of Sleep Disorders-2 (ICSD-2),[17] the diagnosis of Behavioral Insomnia of Childhood (with limit-setting and sleep-onset association type) captured sleep problems of school-aged children and young adolescents quite well. Indeed, many types of insomnia disorders were provided in the ICSD-2. However, with the introduction of the third edition (ICSD-3), most insomnia disorders were removed in favor of a more simplified approach. This meant specific insomnia disorder subtypes and a special pediatric category no longer exist in the ICSD-3, in which simply a distinction is now made between short-term insomnia and chronic insomnia.[18] These two diagnoses solely differ on the criteria of frequency (chronic insomnia requires sleeping problems at least three times per week) and the time frame criterion of problems lasting for at least 3 months for chronic insomnia. Most children and adolescents who seek treatment experience sleep problems over a longer time period and therefore fulfill the criteria of a chronic insomnia diagnosis. For example, Paine and Gradisar[16] found that school-aged children with insomnia were experiencing their sleep problem for 5.7 years, indicating an average age of onset at 3.7 years. Although different etiologic adult models[19] and attempts for models in young children exist,[20] no specific model for school-aged children and adolescents has been developed so far, but an interplay of multiple intrinsic and extrinsic factors is assumed to be crucial.

The recommended first-line treatment of insomnia in adults is cognitive behavioral therapy for insomnia (CBT-i),[21,22] which is a nonpharmacologic treatment that aims to change behavioral (eg, sleep hygiene, bedtime routine) and cognitive (eg, modification of thoughts) patterns to improve the individual's sleep. Adult studies show that CBT-i has beneficial and clinically meaningful effects on sleep[22–25] and even on cognitive performance.[26] Furthermore, the effects of CBT-i do not have the drawbacks of pharmacotherapy, such as habituation and dependence.[22,27] However, the number of studies systematically evaluating the effects of CBT-i in children and adolescents is relatively small, and so far no consensus statement has been published for these age groups, which may be because there are so few studies with these populations, however, this may change. Meltzer and Mindell[28] published a systematic review and meta-analysis on sleep treatments in children and adolescents, which showed that 12 of the 16 included studies focused on infants and young children (birth to 5 years), whereas only 4 studies addressed school-aged children. No randomized controlled trial (RCT) with adolescents could be included in their study at that time. Furthermore, out of the four studies on school-aged children, only one study applied CBT-i explicitly[16] and one study used a brief sleep intervention, which included aspects of CBT-i.[29] A more recent systematic review on CBT-i in adolescents included nine studies investigating the effects of CBT-i in adolescents,[30] with only one RCT that applied CBT-i in adolescents with insomnia without a comorbid disorder.[31]

Before considering CBT-i as a treatment option, children and adolescents should be screened, optimally by parent reports and self-reports, and if necessary treated for physical conditions (eg, allergies, breathing problems, chronic illnesses) that can cause sleeping problems. Because it has been shown that improving sleep has beneficial effects on emotional problems (eg, mood, anxiety),[16,32,33] it is recommended to treat insomnia problems even if it co-occurs with other mental disorders. Still, clinicians should keep comorbidity and situational influences in mind and adapt treatment individually, when needed. In children and adolescents with complaints indicating a delayed sleep-wake phase disorder, dim light melatonin onset (DLMO) should also be assessed, because patients may need exogenous melatonin to fall asleep.[34,35] If a circadian rhythm delay is suspected, the authors recommend clinicians to treat this factor before undertaking CBT-i with the following paper contained within this journal.[36] The diagnostic process of insomnia optimally includes screening questionnaires (self-reports and parent reports), a clinical interview, and sleep diaries (**Table 1**).

In this article, the authors first review the evidence for cognitive and behavioral trials for school-aged children and adolescents and then discuss the practical application of these techniques in each of these populations.

COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA IN SCHOOL-AGED CHILDREN

Empirical Evidence

The age range of school-aged children recruited into clinical trials evaluating CBT-i has ranged between 5 and 13 years of age.[16,45] It is suggested that fewer school-aged children will be able to grasp the concepts and skills needed for complex cognitive therapy skills, yet this is likely to increase from age 7 years.[16] It is also recognized that the

Table 1
Diagnostic tools used in the diagnostic process of insomnia in school-aged children and adolescents

Assessment Tool	
Sleep disorders and sleep disturbances questionnaires[3]	*Specification of Assessment*
	Sleep Disturbance Scale for Children[37]*:* 6.5–15.3 y, parent report *Children's Sleep Habit Questionnaire*[38]*:* 4–12 y, parent report *Behavioral Evaluation of Disorders of Sleep Scale*[39]*:* 5–12 y, parent report
Sleepiness questionnaires[a]	*Cleveland Adolescent Sleepiness Questionnaire*[40]*:* 11–17 y, self-report *Pediatric Daytime Sleepiness Scale*[41]*:* 11–15 y, self-report
Sleep hygiene	*Adolescent Sleep Hygiene Scale*[42]*:* 12–18 y, self-report
Clinical interview	Sleep schedule (bedtime, wake time, naps), evening activities (eg, exercise, social media use, TV), bedtime routine, sleeping environment (eg, lighting, temperature, adequate sleep opportunity), nature of sleep problem (eg, initiating and/or maintaining sleep), night time fears, bedtime refusal and/or need for parental presence, sleepiness and daytime impairments that target diagnostic criteria (eg, emotional problems, school performance), safety behaviors (eg, caffeine, alcohol, medication use), family and social functioning (eg, stress, life events). Information on what measures have already been taken to improve sleep; prior sleep therapies. Information from parents and teachers on daytime functioning can also be helpful. The clinical interview should also be used to screen for other sleep disorders (eg, apnea, narcolepsy) that should be treated differently.
Sleep diaries[b]	Bedtime, sleep onset latency, number and duration of night time awakenings, wake time, sleep duration, naps. Separate assessment for weekdays and weekends are needed, especially for adolescents.
Actigraphy	Objective assessment of bedtime, sleep onset latency, number and duration of night time awakenings, wake time, sleep duration, and naps can provide additional information. Separate assessment for weekdays and weekends are needed. Actigraphy always requires information from sleep diaries.
Polysomnography	Gives information about sleep architecture, sleep quality, and other sleep-related characteristics (eg, breathing). Can be considered if other sleep disorders (eg, sleep apnea) are suspected.
Other technologies (eg, apps, Fitbit)	Aim to measure sleep and wake times; however, their reliability and validity for sleep have not been established. These technologies are therefore not advised for sleep assessment.

[a] Further information and a systematically evaluated list of sleep questionnaires can be found in Spruyt and Gozal, 2011.[43]
[b] See, for example, Carney et al, 2012.[44]

upper end of this age range overlaps with early adolescence (denoted by the onset of puberty). For older school-aged children, the evidence is reviewed here based on the facts that (1) these children do not possess a delayed circadian rhythm contributing to their sleep problem and (2) these children's worries are more centered on issues common in younger school-aged children (eg, fears of harm to self or family members, fears of separation from parents).

Besides the relatively high prevalence rates and the effectiveness of CBT-i in adults, only two RCTs have been conducted to investigate the effectiveness of CBT-i in school-aged children.[28] In the first study, Paine and Gradisar[16] had 42 children between 7 and 13 years randomly assigned to receive either six sessions of CBT-i or a waiting list control group. Their results indicate positive effects in the CBT-i group for sleep (sleep latency, wake after sleep onset, sleep efficiency) and anxiety. These improvements were maintained at the 1-month and 6-month follow-ups. However, no changes occurred in total sleep time. In one other RCT, school-aged children with insomnia were treated with CBT-i: Schlarb and colleagues[45] implemented CBT-i, consisting of three sessions for children and three for parents in 112 children (age range 5–11.5 years). Interventions in this study included sleep restriction, stimulus control therapy, sleep hygiene, relaxation, and cognitive therapy. Results from this study show improvements in sleep problems, sleep onset latency, sleep efficiency, and nocturnal awakenings, but, similar to the study by Paine and Gradisar[16] no changes in total sleep time were found. Improvements persisted also at the 3-, 6-, and 12-month follow-up assessments. In summary, the limited empirical evidence for CBT-i in school-aged children points toward beneficial effects when treating insomnia; however, more controlled intervention studies are needed to further support these findings. Although other studies have applied sleep interventions for school-aged children (for a review, see Ref[28]), these studies (1) did not necessarily focus on children diagnosed with (only) insomnia and/or (2) did not use a combination of behavioral and cognitive techniques. Nevertheless, they frequently used the same techniques as those in the reviewed RCTs and likewise found positive effects on sleep.

Practical Application of Cognitive Behavioral Therapy for Insomnia in School-Aged Children

Concerning school-aged children's sleep, parents' behavior plays an essential role.[46] Often parents are not aware of their dysfunctional parenting behavior and develop or maintain a child's sleep problem (eg, child refuses to sleep in the absence of the parent). Furthermore, parents can forget to positively reinforce healthy sleep behaviors (eg, child goes to bed independently, child sleeps through the night). Thus, children with sleeping problems may experience an imbalance of little positive reinforcement of desirable sleep behaviors and yet too much positive reinforcement of undesirable behaviors, which may perpetuate the sleeping problems. Therefore, CBT-i for school-age children includes both interventions that relate to the parents and interventions that relate to the child.

Children with insomnia often have problems with initiating sleep, which may take the form of long sleep latencies when trying to sleep independently of a parent. This problem can be addressed by faded bedtimes, an intervention in which bedtimes are scheduled at a later time so the child becomes more sleepy when attempting sleep.[47,48] This technique aims to increase children's sleep pressure and consequently decrease sleep onset latencies and is similar to sleep restriction therapy for adolescents and adults.[49] After sleep latencies decrease, bedtimes can gradually be shifted to an earlier time point, where there is a balance between an appropriate amount of time to fall asleep (eg, <20 min) and no daytime consequences. The implementation of a positive routine before the child's bedtime is also considered to have positive effects on children's sleep, because children enter their bed more relaxed. Consequently, a positive association with the sleeping process (here lying in bed) may occur. Furthermore, moving rewarding components (positive activity with the parent) to a daytime activity helps to extinguish its association with sleep.[47] This intervention is similar to stimulus control therapy for adolescents and adults.[50,51] Positive reinforcement also plays a role when it comes to graduated extinction, during which children are gradually exposed to sleeping alone in their bed, whereas negative reinforcement (reduced anxiety due to parental attendance) is removed and replaced by positive reinforcement (eg, rewards for successful achievements and practices).[16] **Table 2** provides the step-by-step instructions for both faded bedtimes and graduated extinction.

Because many children suffer from unpleasant, sleep incompatible feelings and thoughts (eg, "If *I do not fall asleep I will fail at school"),* one important cognitive technique is thought challenging. In the first step, the dysfunctional thought is identified and then in the second step challenged by looking for evidence and against these thoughts and/or even replacing it with a more functional/helpful thought. **Box 1** presents a clinical example of thought challenging for a 10-year-old patient with insomnia. As mentioned previously, school-aged children are more likely to engage with cognitive therapy techniques as they become older. As a general rule of thumb, these techniques can be used with children aged 7 years and older,[16] but there are also capable 6-year-olds who can elicit and challenge thoughts and likewise 9-year-olds (and even adults) who have difficulty with such techniques.

Table 2
Stepwise procedure: faded bedtimes and graduated extinction

Faded Bedtimes	Graduated Extinction
1. Delay the child's bedtime by 15 min and keep this new bedtime consistent for 1 wk. 2. Ensure the child's wake up time is consistent across the 7 d of the wk. 3. Avoid the child napping 4. After 1 wk, if the child's sleep latency is >20 min, repeat Step 1 above 5. If the child's sleep latency becomes <20 min, keep to this new bedtime. 6. If daytime consequences occur (eg, sleepiness at school), then advance bedtimes by 15 min for 1 wk 7. Continue Step 6 if daytime consequences still occur 8. The goal is to strike the balance between the length of the child's sleep latency and the severity and/or frequency of their daytime consequences	1. If a child is in the parent's bed, move them to a mattress on the floor next to the parent. After practicing this step to a point where the child is experiencing less fear/anxiety, move the mattress near the bedroom door (either inside or outside the bedroom). After this is practiced enough, move the mattress further toward the child's bedroom (eg, a room near the parents' bedroom). When practiced enough, keep gradually moving the mattress closer to the child's bedroom, until they are in their own bed. *Note*: often a family might decide to go from parents' bed to a room next to the parents' bed, and then straight to the child's bedroom, as it is more convenient. 2. If a child is in their own bedroom, but needs the parent close by, then the following steps can be taken: a. Parent may be lying down under the covers with the child. b. Parent lies down on top of the covers with the child. c. Parent sits up on top of the covers with the child. d. Parent sits next to the bed, but lays their hand on the child. e. Parent sits next to the bed, but no contact with the child. f. Parent sits near the end of the child's bed or near the bedroom door. g. Parent is outside the bedroom door (eg, sitting on a chair). h. Parent gets to reclaim their night and do what they want for themselves.

(*continued on next page*)

Table 2
(*continued*)

Faded Bedtimes	Graduated Extinction
	b. Parent lies down on top of the covers with the child. c. Parent sits up on top of the covers with the child. d. Parent sits next to the bed, but lays their hand on the child. e. Parent sits next to the bed, but no contact with the child. f. Parent sits near the end of the child's bed or near the bedroom door. g. Parent is outside the bedroom door (eg, sitting on a chair). h. Parent gets to reclaim their night and do what they want for themselves.

In addition to these behavioral and cognitive interventions, CBT-i includes psychoeducation, especially on sleep hygiene, which refers to information about sleeping behaviors and the bedtime routine, because it has been shown that children and adolescents with insomnia often suffer from poor sleep hygiene.[52,53] The general sleep hygiene rules, which should be adapted for each age group, are shown in **Box 2**. In addition, it is important to inform children and their parents about various aspects of sleep, including individual differences in sleep need, sleep homeostatic pressure (as a treatment rationale for faded bedtime), and sleep architecture (ie, cycling from light-to-deep-to-light stages of sleep). Psychoeducation, and especially sleep hygiene rules, should be provided and discussed in detail before the other CBT-i interventions, as understanding the underlying mechanisms may increase motivation and compliance.

Box 1
Thought challenging of a child

Therapist: What worries you about not being able to fall asleep quickly at night?

Child: That I won't get enough sleep and fail my Maths test.

Therapist: So, every night you have a bad sleep, you're likely to fail a test?

Child: Maybe.

Therapist: OK, so what we can do is see how true that thought is by looking at what's happened in the past. How many times have you failed your test?

Child: Once.

Therapist: OK. So earlier, your mum said that you've had a sleep problem for the last 2 years.

How many tests have you had in the past 2 years?

Child: Ummm… probably, about 10.

Therapist: So, you have five tests each year?

Child: I guess not. Maybe it is like 12 or 13.

Maybe 14?

Therapist: OK. But even so. Although you have had a sleep problem over the past 2 years, you have failed 1 test out of about 14.

Child: Yeah.

Therapist: So even though you have slept not so great, you passed 13 tests out of 14.

Child: Yeah, I guess I have.

Therapist: So what are the chances of passing a test, even if you have not slept so great?

Child: I guess they are not so bad.

COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA IN ADOLESCENTS

Empirical Evidence

Similar to the research on CBT-i in children, the scientific literature on the effectiveness of CBT-i in adolescents is rare. Given the positive results from the adult literature and the high prevalence rates of insomnia in adolescents, this constitutes a rather surprising finding. In a recent meta-analysis, Blake and colleagues[30] found nine studies that used adolescent cognitive behavioral sleep interventions, which included only four RCTs, and only one of these RCTs included adolescents with an isolated insomnia diagnosis.[31] The other studies that included adolescents with "insomnia symptoms"/"sleep problems" (with or without comorbid conditions),[50,54–57] adolescents with insomnia and a comorbid psychiatric diagnosis,[58] adolescents with delayed sleep phase disorder[59] were pilot studies[54,57,58,60] and/or uncontrolled studies.[50,54,56,57,61] Still, the results from this meta-analysis showed preliminary positive effects for CBT-i in adolescents, which can be seen in increased sleep durations, decreased sleep onset latencies, decreased wake times after sleep onset, and thus improved sleep efficiency. Furthermore, positive effects were found for sleep quality and daytime functioning, including daytime sleepiness and depressive and anxiety symptoms.[62]

Box 2
Sleep hygiene rules

- A continuous place to sleep (eg, children and adolescents should have their own bed)
- Regular bedtimes: Bedtimes should be roughly the same each day (also on weekends)
- Avoidance of lying in bed for too long (eg, >30 min), waiting to fall asleep
- Sleep supporting environment (eg, cool air temperature, very dim to no light, minimal noise/sound)
- Avoidance of drinks with caffeine
- Reduction of light before bedtimes (including TV, smartphone, computer usage)
- Reduction of stimulating activities before bedtimes
- Adequate physical activity during the day
- No napping throughout the day

Focusing on the only RCT to date that included adolescents with an insomnia diagnosis, de Bruin and colleagues[31] compared CBT-i (provided as online therapy or group therapy) with a waiting list control group in a sample of 116 adolescents (age range: 12–19 years). The intervention lasted for six treatment sessions over 6 weeks, as well as a booster session 2 months after the last treatment session. The program included the following components: psychoeducation/sleep hygiene advice, exercise for worry, thought challenging (ie, cognitive therapy), mindfulness-based relaxation, restriction of time in bed, stimulus control, and finally relapse prevention. Compared with the waiting list control group, both treatment groups improved significantly on sleep efficiency, sleep onset latency, wake after sleep onset, and total sleep time.[31] These improvements were maintained up to a 1-year follow-up, and improvements were also found in symptoms of psychopathology.[33] Using Internet-based CBT-i was shown to be more cost-effective than group therapy,[63]

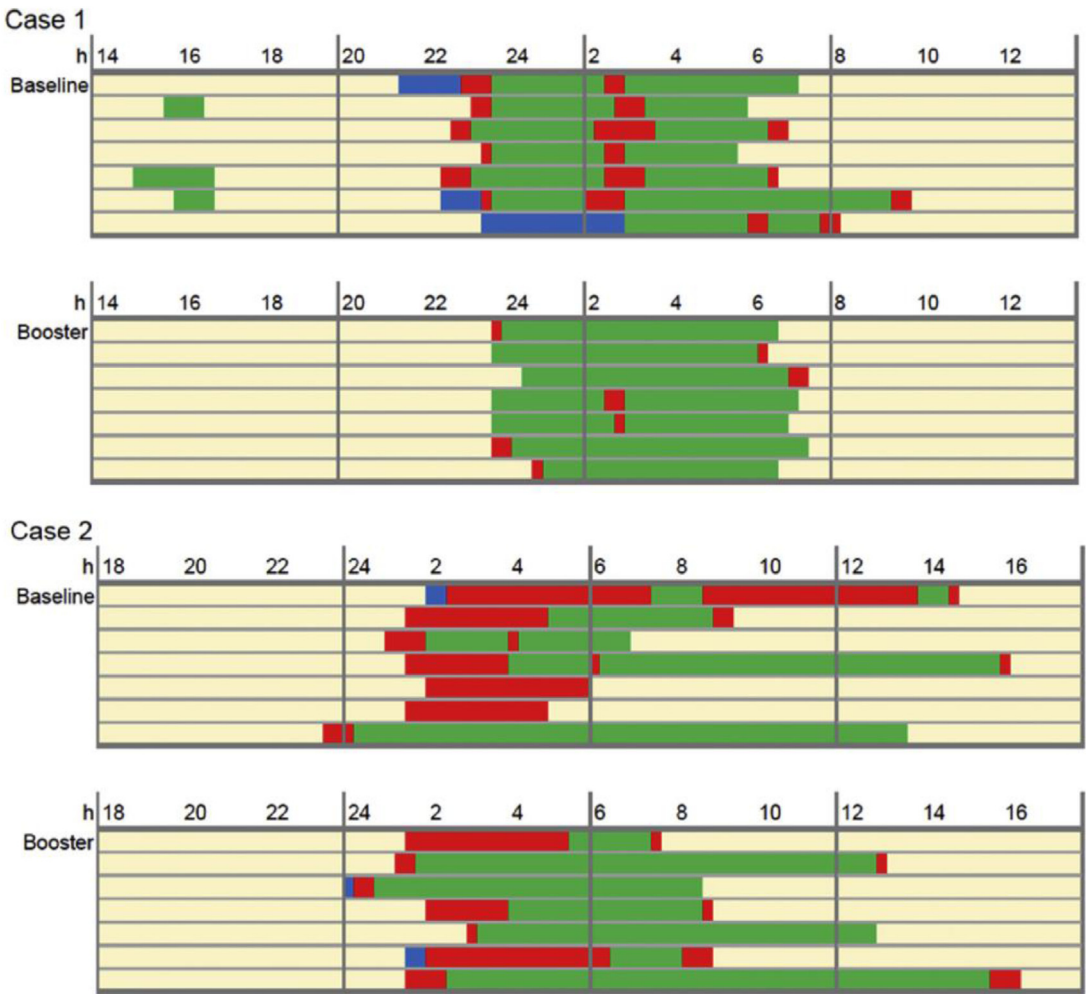

Fig. 1. Sleep diaries of two cases (described in **Box 3**) of adolescents with insomnia before and after CBT-i.

has the advantage to increase availability and access to treatment, and may also be characterized by high acceptability in adolescent populations. One should be aware that using Internet-based CBT-i requires adolescents to use their computer or mobile phone, possibly close to bedtime, which may contradict sleep hygiene advice; however, the effects of electronic media use on sleep are still not fully understood.[64,65]

Practical Application of Cognitive Behavioral Therapy for Insomnia in Adolescents

Before undertaking CBT-i for adolescents, the authors recommend that clinicians first assess for, and treat, any significant delay in their sleep timing (>2 hour difference between weekday vs. weekend bedtimes) that may be due to a delayed circadian rhythm. The rationale behind this is that although cognitive and behavioral techniques are likely to reduce the sleep latency of an adolescent with a delayed circadian rhythm, they are unlikely to advance the timing of their sleep onset time (which may be well past midnight). This delayed sleep onset will perpetuate the restricted sleep of the school-attending adolescent and may prove to become a barrier to treatment. By undertaking chronobiological treatments for the delayed sleep timing,[36] this may provide not only an improvement in an adolescent's sleep phase and duration but also some benefits to any secondary insomnia symptoms.[66]

There exists a gray area between more mild symptoms of delayed sleep phase and insomnia, especially in adolescents. The distinction between the two—even with a DLMO assessment—is not always easy to make and both can be a predisposing or perpetuating factor for the other.[66] Therefore, the predominant complaint should serve as an important factor to decide which to address first, insomnia or delayed sleep phase, or to address both simultaneously. As a principle rule

of thumb for the application of CBT-i, clinicians should decide whether there exists behavioral aspects among the symptoms that are addressed by CBT-i (ie, whether the behavioral techniques from CBT-i will address these symptoms). If the adolescent suffers solely from a biological predisposition for a severe delayed sleep phase, the application of CBT-I as the first line of treatment is not recommended.

Similar to CBT-i for children, thought challenging and sleep hygiene advice (see descriptions discussed earlier) are important for adolescent treatment of insomnia. The application of these techniques does not differ radically from those described for school-aged children. However, stressing the importance to avoid caffeinated beverages and food[67] and interactive electronic media usage[68] is more relevant in this age group. Furthermore, sleep restriction therapy refers to an intervention that directly addresses the main complaint of most adolescents with insomnia problems, namely, difficulty initiating sleep. Similar to the faded bedtimes described earlier, adolescents are asked to restrict their time in bed to consolidate sleep and to decrease sleep onset latencies. The new bedtimes should be determined based on sleep diaries or actigraphy data and have to be discussed with the adolescent.[57] Clinical practice shows that the restriction of time in bed involves going to bed later, as the predominant complaint in adolescent insomnia concerns problems falling asleep, but in some cases the adolescent may prefer to (also) get up earlier. It is important to involve the adolescent in this process, because their agreement to the protocol is needed to ensure compliance. This is essential because clinical practice shows that adolescents often experience sleep restriction as a challenging therapeutic technique. Furthermore, it is important to tailor bedtimes to daytime requirements (eg, school) and change the sleeping habits the adolescent has adopted (eg, long naps or a behaviorally shifted circadian rhythm). It is generally advised to restrict sleep until a sleep efficiency (time in bed/total sleep time*100) of 85% to 90% is reached (depended on other personal and lifestyle factors such as age, school start times, and leisure activities) and then extending bedtimes gradually (eg, by approximately 15 minutes earlier each week).[57,69,70] Sleep restriction should be repeated immediately when sleep efficiency decreases to 80%. **Fig. 1** shows sleep restriction for two clinical cases, highlighting the need to (1) adapt the protocol to the individual, (2) define treatment success differently, and (3) take other comorbidities for further treatment into account (**Box 3**).

Stimulus control therapy aims to disassociate dysfunctional associations between the bed and waking activity/alertness and instead strengthen the association with sleep.[51] Therefore, adolescents are advised to avoid stimuli that are associated with wakefulness in bed (eg, doing homework on or in the bed) and to avoid going to bed before feeling sleepy. If sleep onset does not occur after 20 to 30 minutes, adolescents are asked to get up for about 15 to 20 minutes and stay awake until they feel sleepy, before going to bed again.[69,71] This process is repeated as long as needed to fall asleep within 20 to 30 minutes.[69] However, if the bedtimes from the sleep restriction therapy exercise are set properly and going to bed during the forbidden zone of the circadian phase (ie, peak 24-h circadian alertness) is avoided,[72] stimulus control therapy is rarely needed. In addition, it has been shown that behavioral relaxation techniques

Box 3
Two cases of adolescents treated with cognitive behavior therapy for insomnia

Case 1 was a 17-year-old girl with a history of abuse, who lived independently. She had a predominant complaint of waking after sleep onset and short total sleep time. In the top graph, it is clearly visible that at baseline she sometimes napped during the day and that her bedtime rhythm was somewhat disrupted. Her total sleep time was approximately 6:00 hours and her sleep efficiency 79%. In the bottom graph, 2 months after CBT-i, her bed times had become more regular, and she refrained from napping during the day. Total sleep time had increased to 6:50 hours and sleep efficiency to 95%.

Case 2 was a 14-year-old boy with anxiety problems, who lived alone with his mother. The top graph shows a severe disruption of regular bedtime routines, with long sleep onset latencies and some nights with no sleep at all. The predominant problem seemed to be the absence of daytime routines, which was compounded by the exemption from school for most days because of complex family problems and the infrequent (bedtimes-) support from his mother because of her work hours. At baseline total sleep time was approximately 5:10 hours and sleep efficiency 46%. At 2 months after CBT-i, these increased to 7:20 hours and 72%, respectively.

Although both cases showed significant improvements, they also show that after CBT-i there could be residual sleep problems and that sleep problems of adolescents are often strongly influenced by the context, such as parents, family, and school.

(eg, body scan) can reduce sleep onset latencies, whereas the cognitive technique of constructive worry (writing down worries and solutions instead of worrying in bed) does not, because relaxation decreases psychophysiologic arousal when being applied before bedtime.[73]

SUMMARY

Insomnia is one of the most prevalent sleep disorders in school-aged children and adolescents. Although CBT-i is the first-line treatment for adults and existing studies show promising effects also for children and adolescents, the number of RCTs in these younger age groups is rather small. CBT-i techniques for school-aged children and adolescents include bedtime shifts (including sleep restriction), stimulus control, thought challenging, psychoeducation about sleep, sleep hygiene, and relaxation techniques. The inclusion of parents, especially in school-aged children with insomnia, is highly recommended. The authors strongly urge the scientific community to conduct further controlled trials, including dismantling trials that evaluate the relative effectiveness of individual CBT-i components (eg, thought challenging, sleep restriction therapy)[74]; so clinicians can be more confident in using these techniques to better the sleep health of young people. Furthermore, more research is needed to investigate specific characteristics and models of child and adolescent insomnia.

CLINICS CARE POINTS

- Use questionnaires, including self-reports and parent reports, as well as clinical interviews and sleep diaries to help diagnose insomnia in school-aged children and adolescents. Screen for physical conditions, such as allergies, breathing problems, chronic illnesses, that can cause sleep disturbances.
- Adapt treatments to the individual's comorbidities and situational influences. Treat insomnia problems even if it co-occurs with other mental disorders.

DISCLOSURE

G. Michael has a book contract with the Little Brown Book Company on this topic and has received consultancies from the Australian Psychological Society; there are no other conflicts of interest to declare.

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