Common Sleep Problems in Children

What are the sleep patterns of children?

Sleep plays a vital role in the mental and physical development of children. Growth hormones are actively released by the brain into the bloodstream during sleep to aid maturation. There is also intense brain activity that occurs during the restoration and repair process of sleep. Research shows that duration and quality of sleep are associated with children's higher cortical functions, such as learning, memory, attention, emotional control, problem-solving, etc., as well as behavioral problems.

Human sleep consists of stages of non-REM (NREM) and REM (rapid eye movement) sleep. We go through several cycles of these sleep stages in a typical night. In NREM, N1 is the lightest and shortest stage of sleep, while N2 makes up roughly half of our night's sleep. N3 is the deepest stage of sleep and is followed by REM sleep. In REM sleep, our brain waves are similar to those during waking and dreams mostly occur in this stage.

The sleep patterns of children change throughout their development. The usual duration of a sleep cycle for children is around 30 to 50 minutes. Their sleep consists of a relatively large amount of deep sleep. It is common for children to wake briefly after each sleep cycle, and most of them can fall back asleep without help of an adult.

The table below shows general patterns of sleep in children, but sleep habits may vary between children due to individual differences.

Age	Total sleep time	Daytime napping
0-3 months	14-17 hours	Sleep is on and off during day and night with irregular schedule
4-11 months	12-15 hours	Around 1-4 naps of 30 minutes to 2 hours
1-2 years	11-14 hours	Around 1 nap per day
3-5 years	10-13 hours	Some may have 1 nap and others do not
6-12 years	9-11 hours	Most children at this age do not need napping

(Sleep Foundation, 2020; Raising Children Network, 2019)

What are sleep disorders?

Sleep disturbances can take on many forms. It is common among both children and adults during the course of life. Only when sleep disturbances persist and significantly affect the quality, quantity, and schedules of sleep, giving rise to daytime distress and impairments in functioning are they classified as sleep disorders.

Sleep disorders are a group of conditions that affect normal sleep. They may be caused by medical problems or psychological factors. Foreign studies have shown that up to 50% of children experience sleep-related problems, while around 4% are given a diagnosis of sleep disorder (Carter, Hathaway, & Lettieri, 2014). Sleep deprivation can have negative impacts on children. Signs suggesting a possible sleep problem include, but are not limited to, excessive daytime sleepiness, difficulties falling asleep, frequent night awakenings, poor concentration, increased forgetfulness, moodiness and irritability, as well as deterioration in academic performance.

Common sleep problems in children:

Behavioral Insomnia

Behavioral insomnia in children is characterized by difficulty falling asleep or maintaining sleep causing poor sleep quality and duration. It is often presented as bed resistance or frequent night waking. Children may only be able to fall asleep under specific conditions (e.g. nursing or rocking by parents), show bedtime stalling or refusal (e.g. asking for one more bedtime story, refusing to stay in bed), or wake frequently during midnight needing the help of a caregiver to get back to sleep. It affects approximately 10% to 30 % of toddlers and preschooler and 15% of children ages 4 to 10 years according to foreign studies (Meltzer & Mindell, 2006).

Behavioral therapy is found to be highly effective for children with behavioral insomnia (Morgenthaler et al., 2006). It aims to train parents to identify and monitor sleep-related behaviors of their children. In behavioral therapy, the clinician will guide parents through different ways to help children unlearn undesirable bedtime behavior and develop a positive sleep habit. Common techniques include correcting problematic bedroom behavior and setting up regular bedtime routine.

Behavioral Insomnia: Keys to better sleep
• Establish healthy sleep habits, e.g. setting a consistent sleep schedule and creating regular bedtime rituals. • Use behavioral management techniques, e.g., limit-setting for bed stalling and bed refusal, and graduated extinction for night-waking. (Refer to: https://www.fhs.gov.hk/english/health_professional/OMP_eNewsletter/enews_20140101.html for further infomration)

Sleepwalking

Sleepwalking affects approximately 13.8% of children ages 3 to 13 (Laberge, Tremblay, Vitaro, & Montplaisir, 2000). It is thought to be caused by incomplete arousals during deep sleep and commonly occurs during early hours of sleep. Children with symptoms of sleepwalking would rise from bed when sleeping and walk about in the house, perform daytime tasks, or even show unusual or dangerous behavior. Despite having open eyes, a child suffering from sleepwalking is usually unresponsive to others and can hardly be awakened. The child would then return to sleep and have no memory of the event.

Sleepwalking usually resolves naturally. Keeping the bedroom environment safe is important for the safety of a sleepwalker; other common measures include keeping windows and doors locked and removing obstacles around the house (Ben-Joseph, 2018).

Sleep Terrors

Similar to sleepwalking, sleep terrors are also thought to be caused by incomplete arousals during deep sleep and affect around 17.3 % of children ages 3 to 13 (Laberge et al., 2000). Sleep terrors commonly occur in early childhood, the age of onset for over 80% of cases is between 3 and 10. By the age of 10, nearly 70% of children would have outgrown their sleep terrors (Laberge et al., 2000). Children with sleep terrors would appear frightened and scream or cry intensely during sleep. They are relatively unresponsive to the comfort of others during sleep terrors and cannot recall the event afterwards. Sleep terrors sometimes co-occur with sleepwalking and other conditions.

If you witness your child having an episode of sleep terror, it is best to watch and wait for them to calm down unless they are in immediate danger. Do not try to wake them up as it may further frighten the child. Consult a medical or psychological professional if sleep terrors significantly interfere with your child's sleep or daytime functioning.

Sleepwalking and Sleep Terrors: Keys to better sleep
Reduce the chance of occurrence: • Ensure your child has adequate sleep, as insufficient sleep is the primary reason for these sleep problems. • Maintain good sleep hygiene so your child can keep a regular sleep-wake schedule. Give appropriate responses: • Guide the child back to bed (for sleepwalking) / Watch and wait for your child to calm down (for sleep terror) and return to normal sleep unless they are in immediate danger. • Avoid waking up the child, as it may further frighten the child. • Avoid next-day discussion as it may lead to delayed sleep or bedtime resistance. Safety precautions for sleepwalking events: • Ensure your child's safety, e.g., keeping windows and doors locked, removing obstacles around the house

Nightmares

Dreams are images, feelings, and thoughts that we experience during sleep. They take place during REM sleep when our brain waves are similar to waking and while muscles are inhibited. There has yet to be consensus on the functions of dreams but some research shows that dreams may originate from random signals of our brain and may be associated with memory consolidations (Sayed, 2011). Nightmares are unpleasant and distressing dreams that usually take place during the second half of the sleep period. The content of nightmares often relates to children's developmental stages and challenges. For example, toddlers may have nightmares about separating from parents, pre-school children may have nightmares about monsters or the dark, while school-age children may have nightmares about real danger or death. Exposure to scary videos or movies may also increase the occurrence of nightmares (Cleveland Clinic, 2013). Nightmare disorder is categorized by recurrent episodes of nightmare that cause awakenings (Bhargava, 2011). Unlike sleep terrors and sleepwalking, children usually have clear memory of the nightmares. As a result, they may be increasingly reluctant to sleep after having nightmares. Nightmares sometimes relate to stress or mood disturbances.

Nightmares & Nighttime Fears: Keys to better sleep
Reduce the chance of occurrence: • Avoid exposure to overstimulating images or videos, e.g., frightening movies or television shows. • Ensure your child has adequate sleep, as insufficient sleep increases the frequency of nightmares.

- Identify themes of the nightmare and address possible stressors in your child's life. Seek professional advice before debriefing the contents of the nightmares with children.

Give appropriate responses and help the child to cope with fears:

- Reassure safety with statements, e.g., "we are around, and we will make sure you are safe", "it's only a dream", could help your child to calm down.
- Empathize the child's feelings, e.g., "it's okay to feel scared after a nightmare". Be patient and listen to the child's worries about the nightmare and do not dismiss or downplay them.
- Teach the child coping statements and practice with them before bed, e.g., "monsters are not real", "dark is fun".
- Use soothing objects to comfort your child, e.g., stuffed toy.
- Have fun in the dark with the child, e.g., telling stories in the dark, hide objects and your child has to find with a flashlight.
- Use a night-light or leave the bedroom door open.
- Read children books to help your child to cope with fear at night or nightmares, e.g., "What to Do When You Dread Your Bed". (怕黑不敢一個人睡覺怎麼辦)
- Provide a "bedtime pass" so that children know they have a chance to find you if needed (For details, please refer to https://www.psychology.hku.hk/sleep/asd/strategies-3.html).

Obstructive Sleep Apnea Syndrome (OSAS)

According to a local study, around 4.8% of children in Hong Kong suffer from OSAS. The prevalence of OSAS is higher in boys (Li et al., 2010). Children with OSAS may demonstrate snoring, noisy breathing, sleeping in upright position or with the neck hyperextended, unexplained morning headache, poor appetite, and restless sleep. Unlike adults, some children with OSAS may be overly active instead of sleepy as they get tired during daytime. Enlarged tonsils and adenoids is the most common cause of OSAS, while there are also other risk

factors such as obesity, poorly controlled allergic rhinitis, structural problems of the head and neck, and other muscles and neurological diseases.

OSAS: Keys to better sleep
• Seek medical consultation upon suspicion of OSAS. Respiratory pediatrician, ear and throat doctor, psychiatrists specializing in sleep disorders may perform physical examination and other investigative procedures, such as blood test, sleep study, nasopharyngoscopy, and clinical interviews. • Surgery may be considered for children with severe OSAS.

Restless Leg Syndrome (RLS)

RLS affects around 2% of children (Carter, Hathaway, & Lettieri, 2014). Children with RLS experience uncomfortable sensations and urges to move legs that usually worsen in the evening and at rest. They may have difficulties falling asleep and resist going to bed. Dopamine dysfunction and iron deficiency are thought to be related to the disorder. Excessive or inadequate physical activities may also worsen the symptoms. This condition is common in those with attention-deficit/hyperactivity disorder (ADHD). According to a review study, up to 44% of children with ADHD experience RLS symptoms, and up to 26% of subjects with RLS are found to have ADHD symptoms (Cortese et al., 2005).

RLS: Keys to better sleep
• Maintain healthy sleep-wake schedules and adequate sleep. • Have moderate exercise a few hours before bedtime, e.g., walking, stretching, massaging the affected area, or applying hot or cold packs. • Avoid caffeine or nicotine intake, e.g., coke, chocolates, and secondhand smoking of cigarettes • Seek medical consultation on the need for iron supplementation or medication.

Narcolepsy

Narcolepsy affects around 3 out of 1000 adults in Hong Kong (Wing, Li, Lam, Ho, Fong, & Leung, 2002). Although the prevalence in children is unknown, studies found that more than 30% of adults with narcolepsy begin to experience symptoms before the age of 15 (Meltzer, & Mindell, 2006). Symptoms of narcolepsy include excessive daytime sleepiness, sudden loss of muscle control (cataplexy), hallucinations when falling asleep, and feeling unable to move in sleep (sleep paralysis). Some children with narcolepsy may only present with sleepiness and a diagnosis would only be given if there is clearly excessive as compared with their developmental need for naps.

Narcolepsy: Keys to better sleep
• Seek medical consultation upon suspicion of narcolepsy. Pharmacological treatments are available for severe cases. • Family members and the school should learn about this disorder and provide corresponding accommodations, e.g., scheduled naps at school. • Establish and maintain healthy sleep habits, e.g., adequate sleep, regular sleep-wake schedule, and regular exercises. • Have regular short naps (around 15 minutes) once or twice a day. • Safety precautions: close supervision is necessary on dangerous activities, e.g., cooking or swimming.

How do sleep problems affect children and their family?

Sleep problems in children may negatively affect their daytime functioning, leading to behavioral problems, learning difficulties, irritability, and poor academic performance. Some disorders like OSAS may also impair growth and

cause other health conditions. The sleep of parents may also be affected when the child needs frequent attention at bedtime or throughout the night.

What conditions may co-exist with sleep problems in children?

Research suggests that sleep problems are more prominent in children with psychiatric or neurodevelopmental disorders (Meltzer, & Mindell, 2006). Some sleep problems are more commonly observed in specific types of disorders.

According to a foreign study, around 25 to 50% of children who are diagnosed with ADHD suffer from sleep problems (Corkum, Tannock, & Moldofsky, 1998).

In a local study, 67.9% of children diagnosed with ASD are reported to have significant problems in sleep (Doo & Wing, 2006). Sleep problems in children with ASD are found to be related to problematic daytime behavior, social skills deficits, and repetitive behavior. It is found that the severity of sleep problems predicts daytime symptom severity in ASD children (Tudor, Hoffman, & Sweeney, 2012).

Sleep complaints are also common among children with mood and anxiety disorders; up to 90% of children with anxiety disorders are reported to suffer from at least one sleep-related problem (Chase, 2011). Disrupted or insufficient sleep may also exacerbate mood and anxiety symptoms.

Autism: Keys to better sleep
• Establish regular sleep-wake schedule is important to regulate your child's circadian rhythm. • Establish a regular bedtime routine. Communicate the expected behavior clearly. The use of soothing objects may be helpful. • Tailor a comfortable sleep environment suitable for the child's sensory needs, e.g., brushing, weighted vest and blankets for tactile sensory issues, "white-nose" generators for auditory sensory issues. You may also seek advice from an occupational therapist. • Record the child's sleep patterns in a Sleep Diary. Understand their sleep and wakefulness pattern throughout the day and night for 2 weeks. Use this information to apply suitable sleep strategies for your child.

ADHD: Keys to better sleep
• Sleep hygiene and behavioral therapy (e.g., bedtime fading) • Record the child's sleep patterns in a Sleep Diary. Understand their sleep and wakefulness pattern throughout the day and night for 2 weeks. Use this information to apply suitable sleep strategies for your child. • If the child is on ADHD medication, you may seek medical advice on the need for medication adjustments.

What can I do if my child has sleep problems?

Sleep-related problems are very common among children, though not all children with sleep problems would be diagnosed with a sleep disorder. Sleep problems vary in presentation and severity. While some naturally resolve as children grow up, some require medical or psychological interventions. Below are some strategies to improve your child's sleep:

Establish good sleep habits

Establish a regular bedtime routine

- Set a clear and consistent naptime routine, e.g., nap after lunch.
- Set a bedtime routine. Allow 20-45 minutes for three or four soothing activities (e.g., bath, pajamas, brush teeth, storytime). A chart of the bedtime routine can be beneficial.
- Provide a soothing object, e.g., blanket, doll, or stuffed animal.

Keep a regular schedule

- Set a consistent bedtime that fits the child's natural sleep pattern.
- If the child has a late sleep-onset time, parents can institute bedtime fading by gradually advancing bedtime by 15 minutes until the desired bedtime is reached. This may reduce the bedtime resistance behavior of the child.

Maintain good sleep hygiene

- Provide a comfortable sleeping environment, e.g., comfortable pillow, bed, and clothing, and temperature at around 23°C.
- Keep the room dark when in bed.
- Control exposure to stimulus. Avoid electronics before bed, e.g., television and mobile phone. Avoid caffeine and nicotine consumption later in the day, e.g., chocolate and coke and secondhand smoking of cigarettes.
- Avoid daytime naps after 3pm.
- Keep the bed strictly for sleeping. Avoid watching TV, playing cell phone on the bed.

Behavioral management techniques to promote positive sleep behaviors

Promote positive sleep behaviors

- Use positive reinforcement to promote appropriate behaviors, e.g., sticker chart or rewards
- Avoid punishment to reduce inappropriate behaviors, as punishment is not effective in changing a child's behavior. Avoid using the child's bedroom or making him/her going to bed earlier as punishment.
- Be consistent in your response.
- State the fact (e.g., "it's time for bed") and avoid using questions (e.g., "ready to bed?")
- Provide reasonable choices so the child can have some sense of control (e.g., "do you want to go to bed now or 5 minutes later?")

Institute limit setting

- Set clear bedtime rules, including bedtime routines, Dos (e.g., stay in bed at night), and Don'ts (e.g., go to parent's room).
- Avoid discussing or arguing complaints about bedtime (e.g., "I am not tired") as this might reinforce bedtime problems with increased attention. Tell your child firmly and calmly that it is time to bed.
- Graduated extinction: Put your child to bed drowsy but awake, as this might help your child learn self-soothing and fall asleep independently. Check on your child briefly (1-2 minutes) and quietly to provide reassurance, especially if he or she is upset. Gradually increase the checking intervals in 5-minute increments. Parents should be prepared for "extinction bursts" in the first few nights, and be consistent in their response to the child.
- Return the child to bed if he or she comes out of the bedroom. Praise the child for appropriate behaviors.
- Provide a "bedtime pass" can be useful if your child often makes requests or come to you after bed. Parents can provide the child with one or two passes. Your child has to turn in a pass for each request made, and no more requests can be made if all passes are used up. The "bedtime pass" can be a simple index card. You can also add rewards on the card if the pass is not used (e.g., go cycling).

Promote daytime behaviors

- Get exposure to bright morning light during day time to help regulate the circadian rhythm of your child.
- Have regular exercises.

Be persistent and consistent. Expect "extinction bursts"

- Be persistent and consistent in your response.
- It is common for children to test the limits of parents. Expect "extinction bursts" where the child's behavior may become worse for several days before you begin to see improvements, or occur weeks later after the sleep training.

Seek professional advice

- Consult a medical or psychological professional if the child's conditions significantly interfere with his/her sleep or daytime functioning.

(Mindell & Owens, 2015; NICE, 2013; NICE, 2018; NICE, 2013a; Ben-Joseph, 2018; United Kingdom National Health Service, 2018; Cleveland Clinic, 2013)

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