

# Sleep Problems and Autism Spectrum Disorders

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Sleep disorders are quite common among people with Autism spectrum Disorder (ASD). As much as 80% of them suffer from one or more sleep disorders.

Many [studies](#) have shown that a lack of sleep results in poor daytime behavior in ASD, such as day time sleepiness, depression, anxiety, lack of concentration, hyperactivity, increased distractibility, irritability, and poor learning abilities.

Research has also shown that on average people with autism have a shorter duration of the REM stage of sleep, which is the stage where learning happens, and memories are formed. This overall results in poor cognitive abilities.

Other than that, lack of sleep also worsens the symptom of autism and results in stress and anxiety—both of which in turn makes sleep even more difficult.

Even though sleep disorder is a common issue among people with autism that even plays a role in worsening the symptoms and behavior, yet sleep management is never discussed as a supportive treatment option for autism.

Therefore, it's necessary to address the issue of sleep disorder in autism to

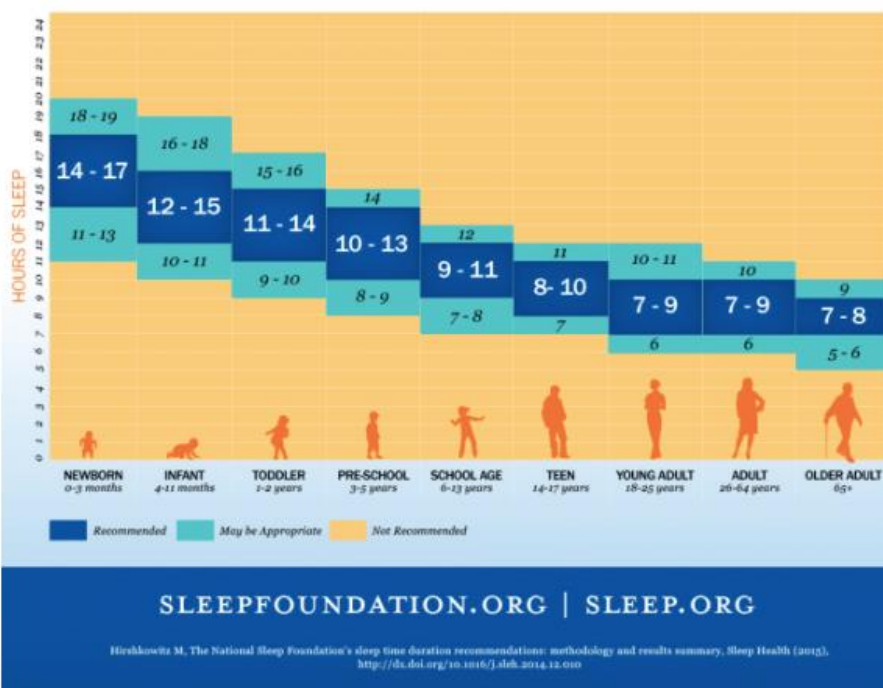
promote healthy growth, control certain symptoms, improve the learning abilities, and promote a better quality of life.

## How to Know if There is a Sleep Issue?

A few things would indicate a sleep issue, including:

- Difficulty falling asleep or staying asleep.
- Waking up multiple times a night,
- Difficulty going back to sleep.
- Presence of snoring, difficulty in breathing, or an altered breathing pattern
- A specific repetitive limb motion when he/she goes to sleep.
- Sleepwalking or night terrors.
- Sleeping less than how much they should. The recommended sleep for kids of different age are as follows (including nap times):

## SLEEP DURATION RECOMMENDATIONS



The most common sleep disorder in ASD is insomnia, characterized by difficulty in falling and staying asleep.

Also, if there's a co-existing medical condition, the chances of them to have a disturbed sleep cycle are higher. More on this is discussed below.

A lack of sleep will show up in their actions and performance the next day. Keeping an eye on how they are behaving will give you an idea. A decline in performance at school, and increased aggression or moodiness could be a sign of sleep deprivation.

Consider keeping a sleep diary, where you can write down the usual and unusual behavior, and the duration of sleep your child is getting every day. It

would help you compare the difference better and will also give the doctor an idea about the probable diagnosis quickly.

### What is the Cause of Insomnia in Autism Spectrum Disorder?

The sleep disturbance in ASD originates from various factors that include biological, environmental, and psychological factors.

Some of the factors that play an important role are:

#### 1. Co-existing medical conditions

People with autism spectrum disorder are more prone to other [medical conditions](#) like anxiety, gastrointestinal problems (constipation, diarrhea, and

gastroesophageal reflux disease), ADHD, tic disorder, OCD, etc. These are a few of many medical conditions that quite frequently occur with ASD, and each of these is known to disrupt the sleep cycle.

For example, the inability to calm down because of too much anxiety or the heartburns as a result of gastroesophageal reflux disease is enough to make them stay up due to discomfort. Also, the treatment of ADHD involves the use of stimulants, which will again result in insomnia.

## **2. Imbalance in melatonin levels and other neurotransmitter action**

It has been found that people with autism have abnormal levels and action of melatonin and certain neurotransmitters like GABA and serotonin.

GABA is an inhibitory neurotransmitter that is also involved in the sleep cycle. It acts on regions of the brain that promotes sleep. Some studies have suggested that the action of GABA in these areas of the brain is disrupted in ASD.

Other studies have shown how the level of melatonin is abnormal in ASD, which is attributed to the deficiency of a serotonin-based enzyme, ASMT (acetylserotonin methyltransferase) in ASD, which is essential for the synthesis of melatonin.

The imbalance in the regulation of melatonin, which is the major hormone that controls sleep, has also been seen.

Normally, the levels of melatonin increase during nighttime and decrease in the day time due to the presence of sunlight. But in the case of autism, a higher level of melatonin is present during the day and a lower level of melatonin is present during the night. This results in insomnia, and daytime sleepiness.

## **3. Increased sensitivity to stimuli**

People with autism are also known to have sensory issues, which can be both hyposensitivity and hypersensitivity.

Hypersensitive individuals have a higher degree of sensitivity towards light, sound, smell, and touch. This might be problematic when it comes to having a good night sleep. Minor sounds, like walking in the room, opening a door in another room, and the streetlight peeking through the window, that doesn't normally influence other people's sleep, might disrupt the sleep of people with ASD.

## **4. Failure to understand social cues**

In general, we know that it's time to sleep by the presence and absence of the sunlight— as monitored by our circadian rhythm. Other than the sunlight, the circadian rhythm is also stimulated by social cues. These social cues for sleep induction include watching our family members preparing or going to bed.

Children with ASD quite commonly suffer from communication difficulties and are known to have difficulty in understanding social cues. They often fail to understand the social cues related

to sleep. This could be one of the reasons for sleep disturbances in ASD.

## Assessment of Sleep Disorders in Autism

Your doctor might ask for a brief history and try to find out the cause of sleep issues. Sometimes sleep disturbance can be a result of improper sleep schedule, and such minor details might come out with history. Symptoms indicating other co-existing medical conditions might also be caught with appropriate questionnaires.

After the questionnaire session is done, your doctor might consider several options to record the sleep cycle of the individual.

1. **Sleep diaries** can be used as a helpful tool. This diary should be used to record all the specific information regarding sleep, like time of going to bed and falling asleep, numbers of times they woke up at night, any specific repeated limb movements, periods of absent breathing, when they wake up in the morning, time and duration of nap times, etc. Anything unusual to the normal occurrence should also be noted down.
2. **Polysomnography** is the gold-standard for the assessment of sleep disorder.

Electrodes are applied to the scalp at bedtime, and sleep-related activities are recorded during the

night. It records the physiology of the body during sleep like eye movement, respiratory rate, leg muscle activities, etc, and the diagnosis is made as per the physiologic response during sleep.

A few things that can be assessed using this technique are total sleep duration, sleep latency, sleep paralysis, abnormal breathing pattern, and narcolepsy. Although they are the gold standard investigation, it might be difficult to be used on some people, especially children.

3. **Actinography** is another convenient method. A watch-like device is placed on the wrist or the leg to detect limb movement, which is used to study the sleep pattern. Total sleep time, sleep onset time, waking time, the number of nighttime awakening, longest sleep period, and the efficiency of sleep are a few things that can be measured with this method.
4. **Videosomnography** involves video recording while sleeping. It will show the number of nighttime awakening, abnormal limb movements, sleepwalking, parasomnias, sleep apnoea, etc.

## How Can You Help Your Child with Autism?

To tackle insomnia a few things that you should consider are:

### 1. Making some changes to your child's bedroom.

Children with autism are highly sensitive to various stimuli, like light and sound. Therefore, the light coming in through a window, the sound of the door creaking, opening or closing doors in another room, and the very hot or cold temperature of the room can disrupt their sleep.

So, you should consider:

- Putting up heavy, dark curtains on the window to block out any light coming through it.
- If your door creaks, get it fixed.
- Consider heavy carpeting in the room to minimize noise produced due to movement in the room.
- Adjust the room temperature as per the comfort of your child.

### 2. Having a relaxing bedtime routine.

Since kids with autism have trouble understanding social cues by themselves, it's a good idea to have a fixed nighttime routine so that your kid can relate to those activities with sleep. Make sure that the routine involves activities that are relaxing in nature, and avoid anything that would increase the activity of your kid. For example, avoid the use of electronics like TV or phone at

least 1 hour before bedtime.

A few relaxing options that you might choose are:

- Soothing bath before bedtime
- Reading a story
- Massage your kid's back gently
- Relaxing music

Stop all other activities 30 minutes to one hour before bedtime and follow your routine every day of the week in the same sequence. The sleep schedule should be at the same time every day as well.

A nighttime routine and a fixed sleeping time will help your kid's mind prepare itself to go to sleep.

### 3. Daytime exercise or activities

Getting your kid involved in exercise or activities requiring a lot of energy will get your kid tired enough by evening to fall asleep quickly.

However, make sure that these activities are not scheduled near bedtime, as that will make your kid over-active and disrupt sleep. Any kind of emotional and behavioral stimulation should be avoided near bedtime as well.

### 4. Appropriate naptime

Naps help recover from the lack of sleep the previous night. It's also important for the normal growth of kids. However, the timing and duration of the nap time are equally important to maintain the balance. Make sure that the nap times are not scheduled late-afternoon. Also, make sure that your kid

is not sleeping for too long during the day.

Younger kids need nap time for proper growth, and therefore naps should be encouraged. A bit older kids may not need naps, and naps should be considered only when they are sick. Teens and adults, on the other hand, don't need naps, and naps would essentially disrupt their sleep at night. They should also consider naps when extremely needed.

### **5. Check what they eat near bedtime.**

Adjusting eating habits would be helpful as well.

Products that contain caffeine should be avoided before sleep. These include chocolate, coffee, tea, sodas etc. In some cases, avoiding caffeine only before bed might not be enough, and so you might want to avoid them altogether.

Avoid eating dinner or snacks very close to bedtime. Also, avoid foods with high sugar and simple carbs before bed as well. Sugar is a stimulant and will impact sleep and sleep quality.

Avoid any food that they might be intolerant to, like dairy products. Acidic foods like spicy foods, and fast foods, should be avoided if they have gastroesophageal reflux disease.

This will avoid any discomfort arising during the night.

### **6. Teach your kid to sleep alone.**

If your kid is habitual of you being around for sleep, they will find it difficult

to go back to sleep again if you are not around when they wake up.

You can teach your kid to sleep alone:

1. Start by interacting less or not cuddling with your kid on the bed.
2. After a few days, sit on a chair next to the bed until your child sleeps. Each day make sure that the distance of the chair from the bed is farther. Do this until you move the chair out of the room.
3. Then start sitting outside the room, not to be seen by your child. If the kid gets upset, wait for some time and then go back to the room to check. Make sure you don't spend a lot of time in the room to comfort them, and not interact a lot either.

The whole process will take a few weeks. Make sure that you keep the interactions and eye contact to a minimum and that you don't spend a lot of time with your child if he/she wakes up.

### **7. Dietary supplement of melatonin.**

Research has found [melatonin supplements](#) are great options to induce sleep in ASD as well. It has been found that they are well-tolerated, effective, and don't have any significant side-effects. Although, more studies are required to see if any long-term effects can result from its use. But so far it has performed well.

They should be administered near



bedtime. It effectively reduces the sleep latency period (the time you take to fall asleep) by as much as 20-40 minutes.

Researches till now have shown that people who use dietary melatonin supplements sleep well and show a subsequent improvement in the behavior.

Over time as the sleep schedule stabilizes, these supplements can be withdrawn. But in some cases, long term use may be required.

Speak to the pediatrician or your doctor regarding the use of melatonin supplements before use.

### **8. Bright light therapy.**

Sunlight is a natural factor that affects our circadian rhythm and thus affects the production of melatonin.

As many autistic individuals have disrupted circadian rhythm and improper regulation of melatonin, bright light therapy is very beneficial to manage the natural circadian rhythm. A light that emits 10,000 lux and filters all the UV light is used in the morning time, immediately after waking up. The exposure with bright lights during the daytime reduces the levels of melatonin and thus prevents day time sleepiness.

Apart from that, bright light therapy is also great for improving mood and behavioral issues in autism.

Avoid using bright light therapy near bedtime, as it will have an opposite effect– exposure to light will reduce the melatonin levels and disrupt sleep.

Speak to your pediatrician about it. If required, he/she will be able to write appropriate referrals.

### **9. Use of essential oils to induce sleep.**

Some research has shown that lavender and peppermint essential oil's aroma is great for relieving stress anxiety and inducing sleep. However, how much it is effective in the case of autism is **still being studied**. So far, the answer to whether essential oils help with sleep in autism is "maybe". But many parents have given testimonials that essential oil's aromatherapy has helped their kids.

You might consider adding a few drops of lavender essential oil in the bathwater or using a diffuser to spread the aroma of lavender in the room, near bedtime. Or use a few drops for massage.

### **10. What about medications for sleep?**

Drugs are kept as the last resort for the management of sleep disturbances. They should only be taken as per the directions of a doctor.

Also, there are no FDA approved drugs for sleep for pediatric cases. Melatonin supplements can be used, however. Speak to the pediatrician regarding its use.

## **A Few Specific Conditions that Might Disrupt the Sleep Cycle in ASD**

While insomnia can be managed with simple interventions mentioned above, sometimes a more complex condition may be present that may be responsible for the sleep disruption. Each of these conditions will need special management depending upon their cause and severity.

### **1. Sleep apnoea**

ASD doesn't increase the risk of having sleep apnoea but it sure is a condition to consider if sleep disturbance is present. Sleep apnoea is a condition in which a person completely stops breathing during sleep. Several causes may result in sleep apnoea, including, enlarged adenoids or tonsils, dental conditions, birth defects, etc.

Therefore, it will require a more extensive examination and investigations to find out the cause. The doctor will be able to suggest an appropriate treatment depending on the cause.

If your child snores and stops breathing intermittently, then that might be an indication that he/she has something obstructing the airways, and this should be brought to the attention of the doctor.

### **2. NREM arousal disorder:**

Conditions like sleepwalking and night terrors come under this disorder. This happens when the brain is partly in

the NREM stage of the sleep cycle and partly awake. Individuals going through this disorder usually don't recall the bad dream or the behavior following the episode.

Sleepwalking refers to the condition when a person gets up or starts walking, partially in sleep. They are, however, capable of performing complex tasks during this period, like opening the door and driving a car. They usually occur in childhood, more common in girls, and the problem usually resolves as the child grows up. The prevalence of sleepwalking in adults is around 1 to 7 percent.

A night terror is a condition in which a person gets up from sleep in total fear, screaming. However, the person will not be completely awake, and usually, go back to sleep following the episode and not remember the incidence the next day.

Both the conditions are mostly self-resolving as the kid grows up. However, in both cases, they are prone to get injured while sleepwalking and therefore certain safety measures like padding of the floor and furniture corner, locking the doors and the windows, and removal of sharp or dangerous objects are useful measures to be taken.

Very severe conditions will require medical treatment. Consult your doctor for proper assessment and to know the best option of treatment for you.

### **3. REM sleep behavior disorder**

This happens during the REM phase



of the sleep cycle, and in this disorder, the individual acts out his/her dreams. This may include screaming, jumping from the bed, punching, kicking, and other forms of violent behavior.

While this condition is usually found in elderly males, autistic kids have been found to have this condition as well.

This condition will require medications to control it. Drugs including benzodiazepines and antidepressants might be used. Consult your doctor for proper evaluation and prescription of medications.

#### **4. Rhythmic movement disorder:**

It includes repeated movement of the head (like headbanging), neck or limbs during the transition period from being awake to sleep.

It is usually common in infants and toddlers, but it may persist in some older children and adults as well.

This condition naturally resolves by the age of 5, but in severe cases, medications might be needed. Drugs like anticonvulsants and antidepressants are used for its treatment. Consult your doctor for proper evaluation and prescription.

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