Sleep disturbance in autism spectrum disorders: Recent advances in research and practice

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When we think of autism spectrum disorder (ASD), it is often the social struggles, communication difficulties and behavioural challenges that come to mind. What is less known is that over two thirds of children with ASD also experience debilitating sleep disturbance (Liu, Hubbard, Fabes, & Adam, 2006). For the child with ASD, sleep disturbance only adds to difficulties coping with everyday life, and can be a mental health tipping point for the child and the entire family.

This article aims to provide an overview of contemporary understanding of sleep disturbance in typically developing children and children with ASD and related neurodevelopmental disorders, for example, attention deficit hyperactivity disorder (ADHD). Implications for clinical practice will be highlighted using the National Health and Medical Research Council funded Sleeping Sound program as an example.

Sleep problems in the general paediatric population

Up to a third of the typically developing children will experience some level of sleep disturbance (Meltzer & Mindell, 2008). Children may have difficulties going to sleep or maintaining sleep during the night, or both. While medical conditions such as obstructive sleep apnoea and epilepsy can cause sleep disturbance, the vast majority of sleep problems in children are behavioural in origin. Commonly occurring behavioural sleep problems include:
Sleep onset association disorder – child associates falling asleep with a certain object (e.g., television) or person and is unable to fall asleep without it

Limit setting sleep disorder – where a parent fails to set appropriate bedtime limits

Delayed sleep phase disorder – where a child falls asleep late and wakes late in the morning

Primary insomnia – where a child is unable to fall asleep even if they go to bed at a later time

Night time anxiety – where a child lies in bed worrying about things that have happened during the day or about specific night time fears (e.g., fear of the dark)

Restless legs syndrome – where a child experiences sensations of creeping/tingling in the legs.

Night waking may also be due to sleep onset association disorder, restless legs syndrome, or anxiety.

**Sleep problems in children with ASD**

There is no evidence to suggest that the sleep disturbances experienced by children with ASD are fundamentally different in nature to the typically developing population. Sleep disturbances are however more common, with up to 80 per cent of children with ASD experiencing sleep disturbance during the primary school years and beyond (Liu et al., 2006). Sleep disturbance can also be experienced as more ‘intense’ for children with ASD and their family members alike. There are many reasons for this, ranging from the child’s lower tolerance for disruption to daily patterns, to the additive strain of sleep disturbance on the already psychologically burdened child and family.

While sleep problems more commonly have behavioural origins in typically developing children, the cause of sleep problems in children with ASD may be underpinned by a more complex matrix of behavioural and biological factors, including neurological comorbidities such as epilepsy, and factors that are fundamental to ASD. For example, while picking up ‘sleep social cues’ (such as when someone yawns they are sleepy) is important for establishing healthy sleeping patterns, and typically developing children seem to pick this up ‘via osmosis’, the child with ASD may miss these vital social sleep cues.

A recent longitudinal sleep study has confirmed what parents of children with ASD have known for a long time: when children with ASD are sleep deprived there is a marked impact on their ability to regulate their emotions and cope with day-to-day social functioning (May, Cornish, Conduit, Rajaratnam, & Rinehart, 2013). In a sample of 60 primary school-aged children with ASD and 60 matched, typically
developing controls, 78 per cent of the children were found to experience sleep problems compared to 29 per cent in the controls, with 65 per cent of children with ASD having persistent sleep problems one year later. Sleep disturbance in children with ASD was associated with increased aggression, hyperactivity and social difficulties and might therefore be an early risk factor or indicator for poor mental health outcomes (May et al., 2013). Sleep disturbance also predicted the emergence of later increased anxiety symptoms after controlling for baseline anxiety levels.

**Assessment of sleep problems in ASD**

This empirical evidence clearly supports best clinical practice to routinely assess sleep in children with ASD. As with any psychological assessment, a comprehensive history should be taken from parents including a detailed description of the current sleep problem. A sleep history should include:

- Pre-disposing factors (e.g., developmental vulnerabilities)
- Precipitating factors (e.g., onset of medical conditions or medications; poor sleep hygiene)
- Perpetuating factors (e.g., napping during the day, co-sleeping, parenting behaviours).

Keeping a sleep diary can also help to determine what factors might be resulting in poor sleep. Depending on the specific sleep problem that is identified, an appropriate intervention can then be selected and implemented.

**Treating sleep problems in children with ASD**

Melatonin is commonly prescribed to treat sleep problems in children with ASD. Clinical trials have shown that melatonin is effective in reducing sleep onset latency but does not increase sleep duration for children with neurodevelopmental disorders (Gringras et al., 2012). Importantly, melatonin use has not been shown to improve child behaviour and family functioning outcomes.

Non-pharmacological interventions which include behavioural sleep therapies have been shown to be effective in treating sleep problems in children with learning disabilities (Montgomery, Stores, & Wiggs, 2004). Research suggests that these parent-based sleep programs not only reduce sleep disturbance, but also improve behavioural functioning and quality of life.

**Attention deficit hyperactivity disorder and ASD**
ADHD is a major occurring comorbidity with ASD. A dual diagnosis of ASD and ADHD has only recently been included in the *DSM-5* criteria (American Psychiatric Association, 2013), bringing it in line with epidemiological studies that show 59-75 per cent of children with ASD have elevated ADHD symptomatology (Liu et al., 2006). Best clinical and research practice now includes describing and assessing ADHD symptoms in all children with ASD.

Both disorders are associated with sleep disturbance, with up to 70 per cent of children with ADHD experiencing sleep disturbance (Sung, Hiscock, Sciberras, & Efron, 2008). As in ASD, sleep problems are associated with poorer functioning for children with ADHD (Sung et al., 2008). Assessing and managing sleep problems when children present with both diagnoses is vital, given sleep problems are likely to be associated with well described poor psychosocial outcomes.

**Sleeping Sound – improving sleep in children with neurodevelopmental disorder**

The original *Sleeping Sound with ADHD* program was developed by Hiscock et al. (Sciberras et al., 2010) and aimed to examine whether treating sleep problems in children with ADHD could improve not only sleep, but broader functioning. The program was designed to be readily incorporated into ‘real life’ clinical practice and was delivered by paediatric trainees and psychologists to 244 children with ADHD randomised to the Sleeping Sound intervention or usual care. The intervention consisted of two 50-minute fortnightly consultations, followed by a follow-up phone call two weeks later. A behavioural sleep management plan was developed, tailored to the child’s specific sleep problem(s).

Children allocated to the *Sleeping Sound* intervention had improved sleep, ADHD symptoms, behaviour, quality of life and daily functioning at three and six months post-randomisation, in comparison to children allocated to the usual care group.

The Murdoch Childrens Research Institute together with the Deakin Child Study Centre recently conducted a small pilot study to examine whether the *Sleeping Sound* program was just as effective for children with ADHD and comorbid ASD. The study found that children with ASD allocated to the brief *Sleeping Sound* intervention had large improvements in sleep and psychosocial functioning at three and six months follow-up. Parental mental health was also shown to improve six months post-intervention for children with ASD. Hiscock and colleagues have now been awarded funding by the NHMRC (2014-2017) to examine the effectiveness of this program when delivered in real life clinical practice by treating paediatricians and psychologists.

**Sleeping sound in the ‘real world’**
A quick Google Search of ‘autism intervention’ will yield 17,000,000 possible websites, while ‘autism sleep intervention’ yields 4,440,000 possible websites – just a glimpse of the Everest of information parents of children with autism have to navigate. Which therapy should they engage in? When? How much? How long? Will it be effective? As we continue to develop evidence-based approaches to managing sleep difficulties in children with ASD, we can never stray too far from the lived experience of children with ASD and their parents.

Many of the families who attend Irabina, Childhood Autism Services, an autism specific early intervention service, report that their children experience difficulties related to sleep. We are excited about recent findings with regard to potentially effective, simple and family friendly interventions for sleep difficulties, and will enjoy sharing innovations with our families.

Deb Goldfinch, Irabina CEO

Conclusion

While this article has focused on sleep disturbance in children with ASD, in the ASD community there is a saying that ‘if you have met one child with autism you have met one child with autism’. This is also true for sleep. There are many children who are fantastic sleepers, and children with ASD who sleep so well they are often described as ‘deep sleepers’ by their parents. Future research understanding the differences between children with ASD who sleep well and those most at risk for sleep disturbance may help us further unravel ASD causes and could add to the growing list of effective interventions.

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References


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