THE CONVERSATION
Academic rigor, journalistic flair

Parents take note: even minor sleep problems can lead to cognitive difficulties in children

July 5, 2017 7.12am EDT

shutterstock

We all know that a good night's sleep is important, but from snoring to night-time waking, sleepwalking to insomnia, sleep problems in childhood are common.

Sleep has many roles, from supporting the development of the brain and strengthening neural pathways to helping the immune system – and disrupted sleep leads to multiple physical and psychological problems. Even in infancy and very early childhood, sleep problems are related to poorer mental and motor development, meaning that by the time children start school those with sleep problems are already falling behind their classmates.

Around 20-30% of children are thought to experience some kind of sleep problem. One of the most common is sleep-disordered breathing, which ranges from snoring to full-blown obstructive sleep

Author

Anna Joyce
Research Associate in sleep and cognition, Coventry University

apnoea syndrome (OSA). This is a disorder where the upper airway becomes blocked which causes difficulty breathing during sleep. Just because a child snores doesn't necessarily mean they have OSA – so, while around 12% of children snore, only around 3% have OSA.

Children who do have OSA usually wake up a lot during the night because they are struggling to breathe. They might also have severe dips in their blood oxygen levels caused by the pauses in breathing. This reduces oxygen delivery to tissues and cells in the body – including the brain.

Having this type of sleep problem has been shown to cause cognitive difficulties, which can impact children's ability to think, pay attention, process information and remember things. Research has also shown that children with sleep-disordered breathing have lower IQs and tend to do less well at school.

Sleep tight

In our recent research, we looked at the effects of sleep-disordered breathing on cognitive development in 44 children aged between two and four – 22 of whom had Down's syndrome. People with Down's syndrome often experience OSA due to physical characteristics like low muscle tone, smaller airways and large tonsils or adenoids. They also experience cognitive and behavioural difficulties which might be related to sleep problems.

We wanted to see how disturbed nights might affect preschoolers, as abilities at this stage of development are often used to predict readiness for school and future life outcomes.

Children with Down's syndrome often have issues sleeping. Shutterstock

Children came to Coventry University where we measured their language, motor and visual skills. we also asked their parents about the children's language ability and behaviour. Parents then took home equipment to measure their child's breathing, heart rate and oxygen levels during sleep.

What we found was that in the typically developing group, children whose oxygen levels dipped the lowest during sleep had the poorest expressive language skills, meaning they had more difficulty putting their thoughts into words and sentences. Those with sleep-disordered breathing also had the poorest behaviour. Their parents reported less pro-social behaviour – like being kind and helping people – and more behavioural problems.

Sound asleep

None of the children we looked at experienced severe OSA so our research shows that, even at the mild end of the spectrum, sleep-disordered breathing is sufficient to cause cognitive difficulties in otherwise healthy children. This is important, as mild OSA in children often goes unnoticed or unrecognised, and at the moment there is no consensus on the level of severity at which it should be treated.

We also found that children who slept for longer had fewer emotional symptoms such as fears, nervousness and unhappiness. This makes sense because previous research has shown that treatment of sleep problems in children usually leads to an improvement in emotional symptoms. It has even been found that childhood sleep problems can predict anxiety disorders in adulthood.

Lack of sleep can impact children emotionally and physically. Shutterstock

Our findings for children with Down's syndrome, however, were inconsistent. With this group, we found those who experienced sleep-disordered breathing actually had better language understanding and used more actions and gestures to communicate. These children also slept for longer than the typically developing children, so it is possible this protected them from the harmful effects of sleep-disordered breathing.

What all this shows is that sleep is probably just one factor among many that can help or hinder children's cognitive development. Nevertheless, given that our findings show a link between even mild sleep problems and a cognitive disadvantage, it is important that we treat sleep problems early – as this might well be the difference between make or break when it comes to schooling.

Children Sleep Down Syndrome Sleeping