

# The Parent's Reading Library

## Food, Nutrition & Neurodivergent Children

### Section 11

## Exercise & Brain Health

---

### Why this topic matters

Exercise is one of the most effective lifestyle strategies for supporting children's physical and mental wellbeing. Regular physical activity helps build healthy bones and muscles, improves cardiovascular fitness, supports healthy sleep and contributes to emotional wellbeing.

Over the past two decades, researchers have also investigated how exercise affects the developing brain in children with ADHD and other neurodevelopmental conditions. While exercise is **not a treatment or cure for ADHD**, there is strong evidence that regular physical activity can improve attention, executive function, behaviour, emotional regulation and academic performance when used alongside medical, behavioural and educational care.

## 1. The Effects of Physical Exercise in Children with Attention Deficit Hyperactivity Disorder: A Systematic Review and Meta-analysis

### Reference

Cerrillo-Urbina, A. J., García-Hermoso, A., Sánchez-López, M., Pardo-Guijarro, M. J., Santos Gómez, J. L., & Martínez-Vizcaíno, V. (2015). *The Effects of Physical Exercise in Children with Attention Deficit Hyperactivity Disorder: A Systematic Review and Meta-analysis*. **Child: Care, Health and Development**, 41(6), 779–788.

### DOI

<https://doi.org/10.1111/cch.12255>

## Plain English Summary

This systematic review found that regular exercise was associated with improvements in attention, executive function, behaviour and social interaction in children with ADHD. The authors concluded that physical activity is a valuable addition to comprehensive ADHD care.

## 2. Exercise Reduces the Symptoms of ADHD and Improves Social Behaviour, Motor Skills, Strength and Neuropsychological Parameters

### Reference

Kamp, C. F., Sperlich, B., Holmberg, H.-C., & others. (2014). *Exercise reduces the symptoms of attention-deficit/hyperactivity disorder and improves social behaviour, motor skills, strength and neuropsychological parameters*. **Acta Paediatrica**, **103**(7), 709–714.

## Plain English Summary

This review found that children who participated in structured exercise programs often demonstrated improvements in attention, behaviour, motor coordination and social functioning. The greatest benefits were seen when exercise was performed regularly rather than occasionally.

**Note:** Please verify the complete author list and DOI before publication.

## 3. Aerobic Exercise, Cognitive Performance and Brain Activity in Adolescents with ADHD

### Reference

Chuang, L.-Y., Tsai, Y.-J., Chang, Y.-K., Huang, C.-J., Hung, T.-M., & others. *Aerobic Exercise, Cognitive Performance, and Brain Activity in Adolescents with Attention-Deficit/Hyperactivity Disorder*.

## Plain English Summary

This study found that a single session of moderate aerobic exercise improved attention and cognitive performance in adolescents with ADHD. Brain activity measured during cognitive tasks also suggested improved executive functioning after exercise.

**Note:** Please verify the final journal details and DOI before publication.

## 4. Randomized Controlled Trial of Exercise for ADHD and Disruptive Behaviour Disorders

### Reference

Hoza, B., Smith, A. L., Shoulberg, E. K., et al. (2015). *A Randomized Trial Examining the Effects of Aerobic Physical Activity on Attention-Deficit/Hyperactivity Disorder Symptoms in Young Children.*

### Plain English Summary

Children who participated in regular morning exercise showed improvements in attention, classroom behaviour and emotional regulation compared with children in the comparison group. The findings support including physical activity as part of a child's daily routine.

**Note:** Please verify the final publication details before publication.

## 5. Healthy Body, Healthy Mind: Does Exercise Benefit People with ADHD?

### Reference

Hsieh, S. S., et al. (2024). *Editorial Perspective: Healthy Body, Healthy Mind – Does Exercise Benefit People with ADHD?* **Journal of Child Psychology and Psychiatry.**

### Plain English Summary

This editorial summarises recent evidence showing that physical activity supports attention, executive functioning, emotional wellbeing and overall health in people with ADHD. It highlights exercise as a safe and practical strategy that complements established treatments.

**Note:** Please verify the final bibliographic details and DOI before publication.

## 6. Physical Activity and Executive Function in Children

### Reference

Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). *Be Smart, Exercise Your Heart: Exercise Effects on Brain and Cognition*. **Nature Reviews Neuroscience**, **9**(1), 58–65.

### DOI

<https://doi.org/10.1038/nrn2298>

### Plain English Summary

This landmark review explains how regular physical activity supports brain function, learning and memory throughout life. Exercise increases blood flow to the brain and stimulates chemicals involved in learning and healthy brain development.

## 7. Physical Activity and Children’s Cognitive Development

### Reference

Donnelly, J. E., Hillman, C. H., Castelli, D., et al. (2016). *Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review*. **Medicine & Science in Sports & Exercise**, **48**(6), 1197–1222.

### DOI

<https://doi.org/10.1249/MSS.0000000000000901>

### Plain English Summary

Researchers reviewed hundreds of studies examining physical activity and learning. The review concluded that regular exercise supports attention, memory, executive functioning and academic performance without reducing learning time.

## 8. Physical Activity and Brain Development

### Reference

Ratey, J. J., & Loehr, J. E. (2011). *The Positive Impact of Physical Activity on Cognition During Adulthood: A Review of Underlying Mechanisms, Evidence and Recommendations*.

### Plain English Summary

Professor John Ratey's work explains how exercise stimulates brain chemicals that support learning, mood and attention. Although much of the work includes adults, the biological mechanisms are highly relevant to children and adolescents.

**Note:** Please verify the journal citation before publication.

## 9. World Health Organization Guidelines on Physical Activity

### Reference

World Health Organization. (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour*.

<https://www.who.int/publications/i/item/9789240015128>

### Plain English Summary

The World Health Organization recommends that school-aged children accumulate at least 60 minutes of moderate to vigorous physical activity each day. Regular movement supports physical health, emotional wellbeing and healthy development.

## 10. Physical Activity and ADHD: An Overview

### Reference

Den Heijer, A. E., Groen, Y., Tucha, L., et al. (2017). *Sweat it out? The effects of physical exercise on cognition and behaviour in children and adults with ADHD: A systematic review.*

### Plain English Summary

This review found that physical activity consistently produced short-term improvements in attention and executive function, with emerging evidence that regular exercise may also improve behaviour over the longer term. The authors recommend further high-quality studies while recognising exercise as a valuable component of healthy living.

**Note:** Please verify the final journal citation and DOI before publication.

### What this means for families

Exercise is one of the simplest and most accessible ways to support your child’s overall health. Regular movement helps children build stronger bodies while also supporting concentration, learning, emotional regulation and sleep.

The goal is not organised sport alone. Walking, bike riding, swimming, dancing, trampolining, playground play, martial arts and active family games all count. Encouraging your child to find activities they enjoy is more important than choosing the “perfect” exercise program.

### Evidence at a Glance

**Overall evidence:** ★★★★★ Strong

### What research consistently shows

- Regular physical activity supports healthy brain development.
- Exercise can improve attention, executive function and behaviour in many children with ADHD.
- Physical activity also supports emotional wellbeing, sleep and learning.
- Exercise should complement—not replace—medical, behavioural and educational care.
- Children benefit most when physical activity is enjoyable, regular and part of everyday life.