

Axial Dysfunction and Neuropsychological Outcomes in Children: Effects of Noninvasive Treatment

Neuropsychological Outcomes After Manual Therapy for Axial Dysfunction with Secondary Autonomic Dysregulation: Results from 159 Children in Two Cohorts Aged 2–6 and 6–12 Years



SOMATO-PSYCHIC
PATHWAY (SPP)



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BACKGROUND

Axial dysfunction in children is frequently associated with behavioral, emotional, and sleep disturbances.

OBJECTIVE

To evaluate whether manual therapy targeting axial dysfunction leads to measurable neuropsychological improvement.

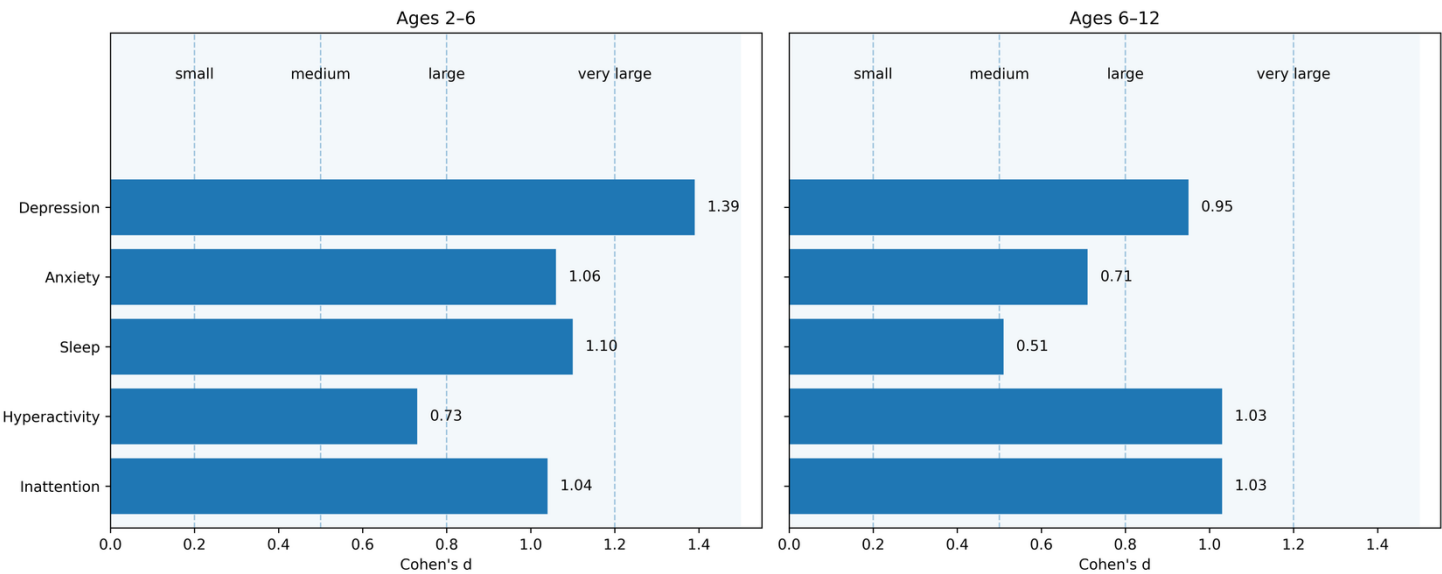
METHODS

N = 159 children
Ages 2–6 (*N* = 105), 6–12 (*N* = 54)
≥5 sessions of individualized manual therapy
PRE–POST parent-report measures:
ADHD Rating Scale IV / SNAP-IV
Children's Sleep Habits Questionnaire (CSHQ)
Revised Child Anxiety and Depression Scale (RCADS)
Statistical analysis: paired tests and effect sizes (Cohen's *d*)

RESULTS

Significant improvements across all domains (*p* < 0.05; most *p* < 0.001). Effect sizes ranged from moderate to very large.

Effect Sizes Across Neuropsychological Domains (PRE–POST)



CONCLUSION

Manual therapy targeting axial dysfunction is associated with clinically meaningful neuropsychological improvement.

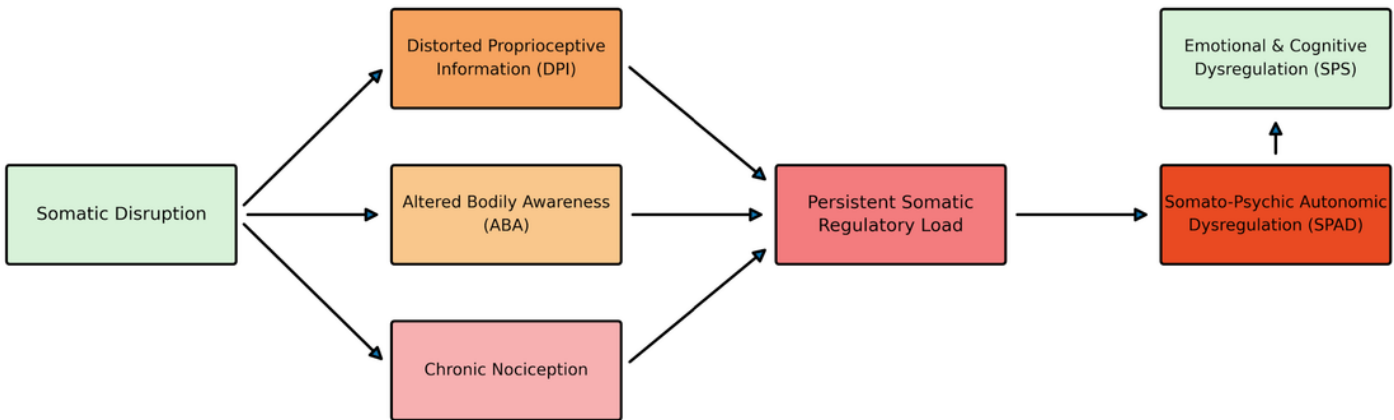
CLINICAL RELEVANCE

These findings suggest that bottom-up influences arising from the axial system, mediated via the autonomic nervous system, may also contribute to neuropsychological symptoms and functioning and should be considered in clinical evaluation and management.

IMPLICATIONS FOR PEDIATRIC AND ADOLESCENT OPERATIVE NEUROSURGERY

- Spinal disruption may impact neuropsychological functioning
- Structural correction may influence neuropsychological outcomes
- This methodology may be applicable for outcome evaluation in spinal surgery

Somato-Psychic Pathway (SPP): Conceptual Framework



Živný, B. (2026). Somato-Psychic Pathway: A Universal Developmental Trajectory Linking Somatic Structural–Functional Integrity, Autonomic Regulation, and the Emergence of Mind. *Frontiers in Integrative Neuroscience*, 20, 1771123.
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