

Thank you for giving me the opportunity to review this paper. It is great to see a sample in this type of research. This paper is well thought through, well written and makes a contribution to the field. There are some points that need clarifying, particularly around mechanisms of change in the introduction and discussion. See below.

Line 85: a decrease in executive function is one reason for being overweight and obese in children.

Consider removing line 85 as the focus here did not include RCT that measured weight loss in overweight children as a result of improving executive functions.

Line 90: Randomized controlled trials on the effects of exercise interventions on executive function in overweight and obese children **were conducted** by searching the PubMed, Web of Science, Embase, Cochrane Library, ProQuest, Scopus, CNKI, China Wanfang, and VIP databases.

Consider changing the wording “were conducted” to “were included”

Line 138: The physiological mechanism by which exercise interventions affect executive function is mainly based on brain plasticity.

This is only one mechanism. For a light discussion of the different mechanisms see

[Multi-Level Meta-Analysis of Physical Activity Interventions During Childhood: Effects of Physical Activity on Cognition and Academic Achievement | Educational Psychology Review](#)

Please amend the wording to include the different possibilities of mechanisms.

Line 147: these studies have shown that exercise intervention can positively affect children's executive function

There are a number of meta-analyses that have been done already and it would be best to reference these instead. This paper reviews them and also completes a comprehensive review of physical activity RCT in middle childhood and effects on executive functions.

Line 253: Subgroup analysis by age by be important because executive functions develop differently in middle childhood an adolescents. I recommend adding this to the analysis.

Line 279 onwards: Please report a GRADE evidence profile for each outcome as done in Vasilopoulos et al., 2024 for executive functions in a typically developing middle childhood population [table S3 in the supplementary material]

[Multi-Level Meta-Analysis of Physical Activity Interventions During Childhood: Effects of Physical Activity on Cognition and Academic Achievement | Educational Psychology Review](#)

Line 391: open and close motor skills relates to linear and non-linear pedagogy in physical education literature. Consider updating the discussion for this. This has been investigated in a typically developing middle childhood population. It is important to distinguish between the cognitive engagement aspect of the activity or the embodied aspect of it in the introduction as to different mechanisms of change. See this paper which discusses these other mechanisms.

[Multi-level meta-analysis of whether fostering creativity during physical activity interventions increases their impact on cognitive and academic outcomes during childhood | Scientific Reports](#)

