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Cognitively enhanced physical activity improves executive functions in preschool children: A systematic review and meta-analysis of randomized controlled trials

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Background

Executive functions (EFs) predict school readiness and academic achievement in young children. Cognitively enhanced physical activity (CEPA) i.e. physical activity (PA) performed together with cognitive tasks may significantly improve preschool children's EFs. Given that EFs are crucial for children's intellectual development and later achievements in life, we sought to review the literature on the effects of CEPA on EFs in preschool children.

Materials and methods

Web of Science, PubMed and APA PsycINFO were systematically searched using predetermined keywords searched for the relevant literature from inception to June 2024. Only randomized controlled trials that had performed CEPA in healthy preschool children and evaluated EFs were included. Quality appraisal of the included studies was assessed via RoB2 tool. Nine studies of 960 participants met the inclusion criteria and were analyzed.

Results

The most consistent improvements in EFs were found in exergaming studies, which fostered CEPA through interactive video games adjusted for preschool children. The meta-analysis confirmed the significant difference of children participating in CEPA compared to children from the control groups with the length of the program being the main feature that guarantees an improvement in EFs.

Conclusions

The most consistent improvements in EFs were found in exergaming studies, which fostered CEPA through interactive video games adjusted for preschool children. The meta-analysis confirmed the significant difference of children participating in CEPA compared to children from the control groups with the length of the program being the main feature that guarantees an improvement in EFs.