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INPLASY

The Impact of Physical Activity on Academic Performance of Adolescents from a Neurocognitive Perspective: A Systematic Review

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ADMINISTRATIVE INFORMATION

Support - Collaborative Governance of Multiple Subjects in the Community to Promote the Social Rehabilitation of Adult Drug Users in the Context of Body-Medicine Integration.(grant number: 22BTY064).

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202530111

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 March 2025 and was last updated on 26 March 2025.

INTRODUCTION

Review question / Objective Learning is one of the most critical developmental tasks during adolescence. Drawing on evidence from neurocognitive science, this study examines the effects of physical activity on academic performance. The review found that physical activity improves healthy fitness, executive function, and learning behaviors in adolescents, which in turn improves academic performance.

Condition being studied No.

METHODS

Search strategy Search for research papers published in international journals up to 1 November 2024 using PubMed, Web of Science, China National Knowledge Infrastructure (CNKI) and Dimensional Spectrum.

Search terms include physical activity, academic performance, cognitive function, inhibitory control, working memory, cognitive flexibility, brain mechanism, physical education, adolescents, randomised controlled trials (RCT), randomised crossover trials.Simultaneously conducting a search using 'subject words+free words'.

Participant or population The study included adolescents between the ages of 5 and 18.

Intervention The experimental group has a strict exercise prescription design, and the intervention methods include various types of physical activities, including game activities, sports activities, physical activities, and fitness activities.

Comparator The control group can participate in daily activities or not intervene.

Study designs to be included Included study designs included randomised controlled trials (RCTs), randomised crossover trials.

Eligibility criteria The PICOS principles and model were used to design the screening, inclusion and exclusion criteria for the study.
Inclusion criteria:
1) The study included adolescents between the ages of 5 and 18.
2) The experimental group has a strict exercise prescription design, and the intervention methods include various types of physical activities, including game activities, sports activities, physical activities, and fitness activities. The control group can participate in daily activities or not intervene.
3) The design of exercise prescriptions follows the standards of the American College of Sports Medicine (ACSM).
4) Included study designs included randomised controlled trials (RCTs), randomised crossover trials
5)The outcome measures are inhibitory control, cognitive flexibility, working memory, academic achievement and academic performance.
Exclusion criteria:
1) Non-English or non-Chinese literature.
2) Non-experimental studies and control group studies without pre- and post-tests.
3) Literature unrelated to exercise prescription, inhibitory control, cognitive flexibility, working memory, academic achievement and academic performance.
4)Review, thesis, conference paper, qualitative research, and literature for which research data are not available.

Information sources Search for research papers published in international journals up to 1 November 2024 using PubMed, Web of Science, China National Knowledge Infrastructure (CNKI) and Dimensional Spectrum.

Main outcome(s) Physical activity, academic performance, cognitive function, inhibitory control, working memory, cognitive flexibility.

Quality assessment / Risk of bias analysis Literature quality and empirical level. The PEDro scale was used to check each document and evaluate its research quality. The higher the score, the better the research quality of this document. Each document was scored independently by two researchers. If there are different scoring items, a consensus was reached after discussion. Due to the characteristics of the included papers, the therapists are required to provide treatment intervention in the research process. The highest total score maybe 9 for the items that cannot be single-blind for the therapists. Therefore, it is determined that those whose PEDro-scale score is greater than or equal to 5 are high-quality papers, and those whose score is less than or equal to 4 are low-quality papers.

Strategy of data synthesis Use a systematic approach to evaluation. Summarise, synthesise and review the literature.

Subgroup analysis No.

Sensitivity analysis No.

Country(ies) involved China.

Keywords Physical activity;Physical education class;Academic performance;Cognitive function; Brain mechanisms; Physical fitness.

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