INPLASY PROTOCOL

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None declared.

Effects of sport on inhibitory function in children with attention deficit hyperactivity disorder: A Systematic Review and Meta-analysis

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Review question / Objective: **Attention deficit hyperactivity disorder(ADHD) is one of the most common neurodevelopmental disorders in childhood, with a global prevalence of approximately 5% to 7%. Insufficient response inhibition is the core functional defect of ADHD. This study intends to conduct a meta-analysis of the research on exercise intervention on the inhibitory function of ADHD children, in order to provide a basis for exercise intervention in ADHD children. P: Children or adolescents diagnosed with Attention deficit hyperactivity disorder. I: Sports or physical activity etc. C: No treatment control. R: Randomized controlled trial.**
Condition being studied: **Impaired executive function is the core cognitive problem of ADHD groups. Drug therapy has limited improvement in the inhibitory function of ADHD children, and 1/3 of the patients are insensitive to drugs, have drug tolerance and adverse reactions, etc., all of which make patients urgently seek effective alternative therapy. but exercise can improve children's inhibitory function. There are few reports and inconsistent results.This study intends to conduct a meta-analysis of the research on exercise intervention on the inhibitory function of ADHD children, in order to provide a basis.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 06 April 2022 and was last updated on 06 April 2022 (registration number INPLASY202240035).

INTRODUCTION

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METHODS

Search strategy: The following research strategy was applied in PubMed and adapted to the other databases:
"Attention Deficit Disorder with Hyperactivity"[Mesh]
((((((((((((((((((ADHD[Title/Abstract]) OR (Adhd[Title/Abstract])) OR (attention deficit disorder with hyperactivity[Title/Abstract])) OR (syndrome hyperkinetic[Title/Abstract])) OR (hyperkinetic syndrome[Title/Abstract])) OR (hyperactivity disorder[Title/Abstract])) OR (hyperactive child syndrome[Title/Abstract])) OR (childhood hyperkinetic syndrome[Title/Abstract])) OR (attention deficit hyperactivity disorders[Title/Abstract])) OR (attention deficit hyperactivity disorder[Title/Abstract])) OR (attention deficit hyperactivity disorder[Title/Abstract])) OR (Addh[Title/Abstract])) OR (overactive child syndrome[Title/Abstract])) OR (attention deficit hyperkinetic disorder[Title/Abstract])) OR (hyperkinetic disorder[Title/Abstract])) OR (attention deficit disorder hyperactivity[Title/Abstract])) OR (child attention deficit disorder[Title/Abstract])) OR (hyperkinetic syndromes[Title/Abstract])) OR (syndromes hyperkinetic[Title/Abstract])) OR (hyperkinetic syndrome childhood[Title/Abstract]) "Child"[Mesh]
(((((children[Title/Abstract])) OR (childhood[Title/Abstract])) OR (school age[Title/Abstract])) OR (youth preschool[Title/Abstract])) OR (Preschoolers[Title/Abstract]) "Sports"[Mesh]
((((((((((((((Athletics[Title/Abstract])) OR (exercise*[Title/Abstract])) OR (endurance[Title/Abstract])) OR (physical exercise[Title/Abstract])) OR (physical activity[Title/Abstract])) OR (motor activity[Title/Abstract])) OR (physical education[Title/Abstract])) OR (acute exercise[Title/Abstract])) OR (chronic exercise[Title/Abstract])) OR (aerobic exercise[Title/Abstract])) OR (exercise intervention[Title/Abstract])) OR (exercise[Title/Abstract])) OR (physical activity[Title/Abstract])) OR (physical fitness[Title/Abstract])) OR (physical[Title/Abstract])
"Inhibition, Psychological"[Mesh]
(((((inhibition[Title/Abstract]) OR (inhibitory control[Title/Abstract])) OR (response inhibition[Title/Abstract])) OR (executive function[Title/Abstract])) OR (Cognition[Title/Abstract])) OR (cognitive function[Title/Abstract]).

Participant or population: Children or adolescents diagnosed with Attention deficit hyperactivity disorder.

Intervention: Sports or physical activity etc.

Comparator: No treatment control.

Study designs to be included: Randomized controlled trial.

Eligibility criteria: Inclusion criteria: ADHD children meet the Diagnosis and Statistics of Mental Disorders Manual (DSM-IV, DSM-5, DSM-IV-TR, ICD-10) The study examines the effect of exercise on inhibitory function. The independent variable is exercise (exercise or physical activity or physical exercise, etc.), and the dependent variable is the effect of exercise

on the inhibitory function of ADHD children; The mean and standard deviation of the inhibitory function of the intervention group and the control group can be obtained directly or indirectly; The research design was a randomized controlled trial There was no significant difference in the baseline data between the intervention group and the control group before the experiment ; Participants are younger than 18 years old; Exclusion criteria: The study does not meet the needs of meta-analysis; There is only a case group and no control group in the study; The experimental group was a comprehensive intervention study; Repeated publication or poor quality assessment; Review, survey, and conference or case papers.

Information sources: The following bibliographic databases were searched without restriction on language or publication year: By searching PubMed, Cochrane, web of science, EBSCO, Embase, Scopus, ProQuest from inception to April 5st, 2022. Only studies published in English were included. Furthermore, the reference lists of included studies and systematic reviews from the last 10 years on the sport on inhibitory function in children with attention deficit hyperactivity disorder were scrutinized for any other studies of relevance.

Main outcome(s): Primary outcomes of ADHD symptoms of hyperactivity and inattention.

Quality assessment / Risk of bias analysis: Two reviewers will independently assess the quality of the included literature, using the risk of bias assessment tool for parallel design trials (ROB 2) recommended by the Cochrane Handbook, covering the randomization process Deviations from established interventions Missing outcome data Outcome measures Outcome selection is reported in five domains, and an overall risk of bias assessment of the reported outcomes of individual studies is made based on the evaluation of several signal questions set within each domain.

Strategy of data synthesis: Data from the post-test measurements of the intervention and control groups in the included randomized controlled studies were used and entered into RevMan 5.2 software for data analysis. The outcome evaluation indicators were all continuous variables, and the effect indicators were expressed as standard weighted mean differences (SMD) and their 95% confidence intervals. Heterogeneity was evaluated by Cochrane Q test and I 2 statistic. When $p < 0.1$ or I 2> 50% indicates statistical heterogeneity, the random effect model is used to calculate the results, otherwise the fixed effect model is considered.

Subgroup analysis: If there is high heterogeneity in the included studies, we will perform subgroup analyses to explore the differences in age, sport training program and course of the intervention time.

Sensitivity analysis: After excluding a lowquality study, the combined effect size was re-estimated and compared with the results of the Meta-analysis before exclusion to explore the extent of the effect of the study on the combined effect size and the robustness of the results. If the results did not change significantly after exclusion, it indicates that the sensitivity is ow and the results are more robust and credible; on the contrary, if large differences or even diametrically opposite conclusions are obtained after exclusion, it indicates that the sensitivity is high and the robustness of the results is low, and great care should be taken when interpreting the results and drawing conclusions, suggesting the existence of important and potentially biased factors related to the effects of the intervention, and the source of the controversy needs to be further clarified.

Country(ies) involved: China; Republic of Korea.

Keywords: Attention deficit hyperactivity ; Sports, physical activity; inhibitory function; child.

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