INPLASY

Effect of Aerobic Exercise on Adolescent Psychological and Cognitive Health: a systematic review with Bayesian network meta analysis

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INTRODUCTION

Review question / Objective The aim of this systematic review is to compare the effectiveness and acceptability of different aerobic exercise interventions in mental health and cognitive function to better inform clinical practice. To this end, the proposed systematic review will address the following issues :Aerobic exercise interventions (low-intensity, moderate-intensity, high intensity continuous training(HICT), high intensity interval training(HIIT) to no exercise), Which is the best option to improve the mental health and cognitive function of Adolescents and young people?

Condition being studied The incidence of depression rises dramatically during adolescence, a period of significant physical, psychological, and social change. Early identification and effective treatment of adolescent depression are particularly important because it can severely hinder the personal and professional development of the individuals involved. However, psychotherapy can be difficult to access and expensive.

Recently, there has been increasing interest in physical activity as a sole or complementary treatment option for depression in adolescents. Studies have shown that aerobic exercise has the most significant effect on improving depressive symptoms in children and adolescents. Additionally, there may be significant differences in the effects of different types of aerobic exercise on depressive symptoms, with high-intensity exercise potentially leading to faster improvements in mental health.

The purpose of this study was to compare different types of aerobic exercise as mono-therapy or adjunct therapy to determine the best exercise type, frequency, and intensity for treating adolescent depression.

METHODS

Participant or population Adolescents and young people with or without mild psychological disorders.
Exclusion: Patients with phobias, obsessive-compulsive disorder, panic disorder, post-traumatic stress disorder, eating disorders, bipolar

disorder, alcohol or drug abuse, ADHD, autism, special populations including pregnant women, athletes, patients with pathological diseases (e.g., cancer).

Intervention High-Intensity Interval Training, high intensity continuous training, moderate-intensity continuous training, low-intensity training.

Comparator No exercise.

Study designs to be included RCT.

Eligibility criteria 1. The included studies included people under 25 years of age who were (a) generally healthy, (b) a mix of generally healthy people with mild mental illness (e.g., anxiety, depression), or (c) without a specific health condition;2. Include randomized trials or non-randomized studies assessing the effects of at least one type of aerobic exercise (e.g., HIIT, MICT) or at least one mode of exercise on mental or cognitive (e.g., memory) health-related outcomes; 3. published between January 1, 2020 and June 30, 2024; 4. It's written in English.

Information sources MEDLINE, EMBASE, Web of Science, CINAHL, CENTRAL, SPORTDiscus, PsycINFO, PubMed.

Main outcome(s) Efficacy: mental health released score, cognitive function released score.

Quality assessment / Risk of bias analysis ROBII.

Strategy of data synthesis Based on the size of heterogeneity, outcomes with an I² less than 50% will use a fixed effects model, while outcomes with an I² greater than 50% will use a random effects model. For continuous variables, we will use means and standard deviations (SD). For studies reporting only medians and interquartile ranges or full ranges, if the investigators did not report these values or respond to queries, these data were estimated. For dichotomous variables, we will use the number of events and the total number of participants. The R package netmeta will be used for data analysis.

Subgroup analysis Subgroup analysis and investigation of heterogeneity
We plan to explore the following subgroups:
• treatment duration
• gender.

However, the final decision on whether to perform these analyses will be based on the results of the data extraction.

Sensitivity analysis Sensitivity analysis is used to check whether the overall findings are robust for potential impact decisions. The results are represented by forest plots.

Country(ies) involved China.

Keywords High-Intensity Interval Training；High-intensity continuous training；Moderate-intensity continuous training；Low-intensity training；cognitive functioning；mental health；Adolescent；Youth.

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