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Cardiopulmonary Fitness in Chinese Children and Adolescents: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 March 2024 and was last updated on 26 March 2024.

INTRODUCTION

Review question / Objective The objective of this artical is to systematically analyze the cardiopulmonary fitness test data of Chinese children and adolescents, accurately understand the cardiopulmonary fitness state of Chinese children and adolescents, and provide baseline data for the development of physical activity and health intervention projects and public health decisions for children and adolescents.

Condition being studied Cardiorespiratory function (CRF) comprehensively reflects the ability of the human body to absorb, transport, and utilize oxygen. It involves the heart's pumping function, the ability of the lungs to absorb and exchange oxygen, the efficiency of the blood circulation system to carry oxygen to various parts of the body, and the function of muscles and other tissues to utilize this oxygen. Cardiopulmonary fitness, as a core element of various components of physical fitness, plays an important role in both growth and development of children and adolescents. Cardiopulmonary fitness has become a widespread focus in the field of public health. Physical fitness is a systematic project that includes multiple indicators and dimensions, but as a core element of physical health, cardiopulmonary fitness must be given special attention.

METHODS

Participant or population Chinese children or adolescents (i.e., school-age children enrolled in primary or secondary school or mean age between 5 and 18 yr).

Intervention Not Applicable.

Comparator Not Applicable.

Study designs to be included cross-sectional study.

Eligibility criteria • include Chinese children or adolescents (i.e., school-age children enrolled in primary or secondary school or mean age between 5 and 18 yr) • assess cardiopulmonary fitness by 20-meter shuttle run, cycle ergometer or treadmill • have at least one outcome indicator, such as 20 meter round-trip laps, maximum oxygen uptake, maximum heart rate, or peak oxygen uptake • be a cross-sectional study • be published between 2000 to 2023.

Information sources Electronic databases (CNKI, Web of Science, PubMed, VIP, and Wanfang).

Main outcome(s) The main outcomes will include cardiopulmonary fitness indicators for Chinese children and adolescents (e.g., 20m-SRT laps, maximal oxygen uptake and maximal heart rate).

Quality assessment / Risk of bias analysis Two reviewers (MYH and SY) independently assessed the risk of bias. We assessed the quality of studies based on study design using the AHRQ scale which is recommended for quality evaluation for observational studies. Using Begg's test for publication bias.

Strategy of data synthesis CMA V2 (Comprehensive Meta Analysis V2) software will be used to conduct the meta-analysis, calculate the combined effect values, create forest plots, calculate the combined effect values and their 95%. Using Q-test and I-squared test to evaluate heterogeneity, if P50%, it indicates the existence of heterogeneity, and using a random effects model; On the contrary, a fixed effects model is used. Conduct subgroup analysis by gender, age, grade, and time period. Using the Begg's rank correlation method to test for publication bias, if P>0.05, it indicates that there is no publication bias, otherwise there is publication bias.

Subgroup analysis Subgroup Analysis of Cardiopulmonary Fitness in Chinese Children and Adolescents will be conducted by gender and by Ethnic.

Sensitivity analysis CMA V2 (Comprehensive Meta Analysis V2) software was used to conduct the meta-analysis, including heterogeneity testing and sensitivity analysis.

Country(ies) involved China.

Keywords Cardiopulmonary Fitness; Children and Adolescents; Meta-analysis; Systematic Review.

Contributions of each author
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