INPLASY PROTOCOL

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None declared.

Effectiveness of physical activity interventions for core symptoms of autism spectrum disorder: a systematic review and meta-analysis

Wang, SM[1]; Chen, AG[2].

Review question / Objective: **The purpose of this study was to verify the effectiveness of physical activity as an intervention on the core symptoms of autism, including social impairment and repetitive stereotyped behaviors.**
Condition being studied: **Autism Spectrum Disorder (ASD) is a severe, lifelong neurodevelopmental disorder that occurs in early childhood and is characterized by social communication disorders and repetitive behaviors that limit or impair daily functions. According to Diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders, autism spectrum disorder consists of two core symptoms. The first core symptom is social dysfunction, which is manifested by lack of orientation to social stimuli, problems in maintaining social interactions, difficulties in interpreting verbal and nonverbal social cues, emotions and facial expressions, lack of empathy, etc. Another core symptom is Stereotypies behaviours, which are characterized by high frequency of repetitive, stereotypies behaviours that crave monotonic environments, including hand clapping, finger or arm wiggling, open mouth, mouth and face movements, and body swaying, and changes in breathing may accompany these movements.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 December 2022 and was last updated on 14 December 2022 (registration number INPLASY2022120058).

INTRODUCTION

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METHODS

Participant or population: Autism spectrum disorder (ASD) is a lifelong neurodevelopmental disorder that limits or impairs dailyfunctioning characterized by social communication, socialinteraction disorders, narrow interests, and repetitive stereotypes.

Intervention: Physical activity.

Comparator: Receive daily rehabilitation interventions.

Study designs to be included: RCT and non-RCT experimental study design.

Eligibility criteria: Criteria for diagnosing autism spectrum disorder from the DSM.

Information sources: Databases including PubMed、Cochrane Library、Web of Science、APA PsycNet、CNK were used to search relevant studies published in English and chinese from inception to December 1, 2023.

Main outcome(s): The results of this study are intended to obtain the effect of physical exercise on the core symptoms of autismCore symptoms of autism spectrum disorder, including social impairments and repetitive stereotyped behaviors.

Quality assessment / Risk of bias analysis: The methodological quality of each included study was independently assessed by two reviewers according to the criteria of the Physiotherapy Evidence Database (PEDro) scale . The PEDro scale includes 11 rating criteria regarding eligibility, randomization, allocation, blinding (subjects and experimenter), intention-to-treat, between-group comparison and point measures. The scores of PEDro range from 0 to 10, and the median score is 5. However, one review pointed out that blinding may be impossible in many tri-als of exercise interventions. It is challenging to score two points for blinded subjects and blinded therapists involved in an exercise intervention. Thus, considering the limitations of exercise interventions, the scoring system can be divided into three categories: high quality ≥ 6, adequate quality = 4–5, and low quality ≤ 3. Two reviewers independently evaluated the methodological quality of the included studies based on the 11 PEDro criteria and calculated overall scores to determine the study quality. Discrepancies regarding quality ratings were discussed until consensus was reached, with a third researcher making the final decision if agreement could not be reached.Quality assessment was performed using the Physiotherapy Evidence Database, PEDro.

Strategy of data synthesis: This meta-analysis was carried out using Comprehensive Meta-Analysis Version 2.0 software. The effect size was calculated by using the standardized meandifference statistic. Heterogeneity across selected studies was determined by Higgins I^2 statistic, which determined analysis models for each outcome. If $I^2$was≤50%, heterogeneity did not exist, thus the analysis model used a fixed-effect model. If $I^2$was>50%, heterogeneity did exist, thus the analysis model used a fixed-effect model. The effect sizes of selected studies

were calculated if a minimum of 2 studies reported the same outcomes.

Subgroup analysis: Subgroup analysis was performed on Duration (Week)<12, ≥12; Intervention time (Min)<60, 60~90, ≥90; Frequency of intervention per week 1~2, ≥3 in all studies.

Sensitivity analysis: Sensitivity analysis was performed using Comprehensive Meta-Analysis (CMA) Version 2.0. The sensitivity of the article is reflected by the change in the effect size after removing one of the studies.

Country(ies) involved: China.

Keywords: Physical activity; ASD; Core symptoms; Systematic review; meta analysis.

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