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A meta-analysis of the auxiliary efficacy of aerobic, resistance, and high-intensity interval in patients with diabetes

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ADMINISTRATIVE INFORMATION

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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 17 December 2024 and was last updated on 17 December 2024.

INTRODUCTION

Review question / Objective According to the PICOS principles of Meta-analysis, the topic "Differences in adjuvant therapeutic effects of aerobic, resistance, and high-intensity interval training exercises on diabetic patients" is rewritten as follows:

P (Population):The primary focus of this study is on diabetic patients.

I (Intervention):The interventions include aerobic exercise, resistance exercise, and high-intensity interval training (HIIT). These forms of exercise will be used as adjuvant therapies to improve the health status of diabetic patients.

C (Comparison):The comparison measure is medication-only treatment, where patients receive only conventional diabetic medications without any form of exercise intervention.

O (Outcome):The primary outcome measure of the study is adjuvant therapeutic effect, specifically manifesting as improvements in blood glucose control, insulin sensitivity, cardiovascular health, and other aspects among diabetic patients after intervention with different forms of exercise.

S (Study Design):This study employs a comparative experimental design, establishing experimental and control groups to compare the differences in the adjuvant therapeutic effects of different forms of exercise (aerobic exercise, resistance exercise, HIIT) versus medication-only treatment in diabetic patients. Patients in the experimental group will receive corresponding exercise interventions in addition to medication, while those in the control group will only receive medication. By comparing the treatment outcomes of the two groups, the effectiveness and safety of different forms of exercise in the adjuvant therapy of diabetic patients will be assessed.

Condition being studied Diabetes is a metabolic disorder caused by insulin deficiency, which

causes a series of complications. Aerobic exercise, resistance exercise, and high-intensity intermittent exercise can reduce the symptoms of diabetic patients from different angles in terms of sugar consumption, insulin resistance, and post-exercise oxygen consumption, improve the effect of drug treatment, or reduce the dosage of drugs.can reduce the symptoms of diabetic patients from different angles in terms of sugar consumption, insulin resistance, and post-exercise oxygen consumption, improve the effect of drug treatment, or reduce the dosage of drugs.

METHODS

Participant or population Patients with diabetes.

Intervention Diabetic patients were divided into aerobic exercise group, resistance exercise group, and high-intensity intermittent exercise group, and the control group was simple drug treatment group.

Comparator Medication alone.

Study designs to be included Randomized controlled trial（RCT）.

Eligibility criteria Aerobic exercise standards: Exercise that can last for more than 20 minutes and with a heart rate lower than 60% of the maximum heart rate (220-age). Resistance exercise standards: Repeat 10 times at 50%, 75%, and 100% of the 10RM weight, with a 1-minute interval between sets, and add 1 set per week. High-intensity interval exercise standard: 60 seconds of high-intensity exercise (70%-90% of maximum heart rate) combined with 60 seconds of interval training, 20 minutes each time, 3 times a week.

Information sources China National Knowledge Infrastructure（CNKI）, pubmed, ambase, Web of Science（wos）.

Main outcome(s) Blood sugar, blood lipids, glycosylated hemoglobin, arterial plaque, inflammatory factors, etc.

Quality assessment / Risk of bias analysis Cochrane tools analyze primary studies.

Strategy of data synthesis Choose STATA software for data analysis. I2>50% and P<0.1 are considered heterogeneous, and random effects are selected to combine effect sizes. There is no heterogeneity in selecting fixed effects pooled effect sizes.

Subgroup analysis Can be divided into: aerobic exercise subgroup analysis, resistance exercise subgroup analysis, high-intensity interval exercise subgroup analysis.

Sensitivity analysis STATA software conducts sensitivity analysis to reflect the sensitivity of the article by changing the effect size after deleting one of the articles.

Country(ies) involved China.

Keywords Diabetes; aerobic exercise; resistance exercise; high intensity interval exercise.

Contributions of each author
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