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Evaluating the Impact of Exercise Dosage and ACSM Guideline Adherence on Fibromyalgia Outcomes: A meta-analysis of randomized controlled trials

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ADMINISTRATIVE INFORMATION

Support - No financial support.

Review Stage at time of this submission - Completed but not published.

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 P (Population): Adults diagnosed with fibromyalgia. I (Intervention): Exercise therapy. C (Comparison): Non-exercise therapy or no treatment. O (Outcomes): Improvement in fibromyalgia outcomes, including but not limited to pain intensity, quality of life, fatigue, sleep quality, and physical function. S (Study Design): Randomized controlled trials. This meta-analysis aims to evaluate the effects of exercise dosage and adherence to the American College of Sports Medicine (ACSM) guidelines on efficacy in FMS patients.

Condition being studied Fibromyalgia Syndrome (FMS), characterized by widespread pain and associated symptoms, affects an increasing portion of the population, posing significant health and economic burdens. Exercise therapy, recommended by the American College of Sports Medicine (ACSM) for its cost-effectiveness and symptom relief potential, remains underexplored in terms of optimal intensity and adherenceeffects.

METHODS

Participant or population Randomized controlled trials• Study subjects were FM patients• The experimental group intervention could encompass any type of exercise, including resistance training, aerobic exercise, flexibility exercise, etc • Control interventions could involve no treatment or traditional treatment, such as conventional medication or care• Outcome measures in the study encompassed overall state of health, pain, sleep quality, fatigue, and mental health, including FIQ, VAS (Visual Analog Scale), SF-36 (36-Item Short Form Health Survey), BDI (Beck Depression Inventory), and others.

Intervention Exercise therapy.

Comparator Non-exercise therapy or no treatment.

Study designs to be included Randomized controlled trials.

Eligibility criteria Excluded criteria: • Studies reported as conference abstracts, review articles, or editorials• Participants with other chronic diseases, especially those related to chronic pain• Studies that administered other treatments during the exercise intervention, such as drugs, relaxation therapy, or specific sports (e.g., tai chi, Pilates, aquatic exercises)• Duplicate publications reporting the same experimental data from a single study• Unclear details of the intervention.

Information sources Literature searches were independently conducted by two researchers from the establishment of the database up until October 2023. Computer searches were performed in various databases including PubMed, Embase, Cochrane Library and Web of Science.

Main outcome(s) In this study, primary outcomes included FIQ and HAQ, which reflect the overall state of health, while secondary outcomes comprised pain, sleep quality, fatigue, and mental health.

Quality assessment / Risk of bias analysis The quality of the included studies was assessed by two pairs of authors using the Cochrane Collaboration's recommended quality evaluation standard for randomized controlled trials (Review Manager 5.4).

Strategy of data synthesis We conducted this meta-analysis using Stata 15.1 to compare the outcomes of the selected studies. These studies were divided into two groups based on their adherence to the ACSM guidelines, categorized as high, low, or indeterminate compliance. To assess the heterogeneity within each subgroup, we employed the Higgins I2 statistic following the guidelines outlined in the Cochrane Handbook. A fixed-effects model was applied when the I2 value was 50% or less, while a random-effects model was utilized for I2 values exceeding 50%. The effect size was expressed as the SMD along with its corresponding 95% Confidence Interval (95% CI).

Subgroup analysis To evaluate the adherence to the recommended exercise dosage outlined by the ACSM (11th Edition), two researchers independently assessed each aspect of the exercise intervention from the included studies. We utilized a scoring system that awarded 0 to 2 points for each indicator of exercise, where 2 points signified adherence, 1 point suggested ambiguity, and 0 points reflected non-adherence. Whenever discrepancies arose, a third researcher was consulted to achieve consensus. This method facilitated the calculation of the extent of compliance with the ACSM's recommended exercise dosages in each study. Studies were deemed to exhibit high compliance if the proportion of adherence was 75% or above, and low or uncertain compliance if below this threshold.

Sensitivity analysis We examined publication bias by generating a funnel plot to explore the relationship between each study's effect size and its standard error. To assess funnel plot asymmetry, we conducted sensitivity analysis using Stata 15.0, progressively excluding studies to assess the robustness of our results.

Country(ies) involved China.

Keywords fibromyalgia, exercise dosage, ACSM, meta-analysis, treatment outcomes.

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