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# Aquatic exercise training for fibromyalgia.

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## Abstract

**BACKGROUND:** Exercise training is commonly recommended for individuals with fibromyalgia. This review examined the effects of supervised group aquatic training programs (led by an instructor). We defined aquatic training as exercising in a pool while standing at waist, chest, or shoulder depth. This review is part of the update of the 'Exercise for treating fibromyalgia syndrome' review first published in 2002, and previously updated in 2007.

**OBJECTIVES:** The objective of this systematic review was to evaluate the benefits and harms of aquatic exercise training in adults with fibromyalgia.

**SEARCH METHODS:** We searched The Cochrane Library 2013, Issue 2 (Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects, Cochrane Central Register of Controlled Trials, Health Technology Assessment Database, NHS Economic Evaluation Database), MEDLINE, EMBASE, CINAHL, PEDro, Dissertation Abstracts, WHO international Clinical Trials Registry Platform, and AMED, as well as other sources (i.e., reference lists from key journals, identified articles, meta-analyses, and reviews of all types of treatment for fibromyalgia) from inception to October 2013. Using Cochrane methods, we screened citations, abstracts, and full-text articles. Subsequently, we identified aquatic exercise training studies.

**SELECTION CRITERIA:** Selection criteria were: a) full-text publication of a randomized controlled trial (RCT) in adults diagnosed with fibromyalgia based on published criteria, and b) between-group data for an aquatic intervention and a control or other intervention. We excluded studies if exercise in water was less than 50% of the full intervention.

**DATA COLLECTION AND ANALYSIS:** We independently assessed risk of bias and extracted data (24 outcomes), of which we designated seven as major outcomes: multidimensional function, self reported physical function, pain, stiffness, muscle strength, submaximal cardiorespiratory function, withdrawal rates and adverse effects. We resolved discordance through discussion. We evaluated interventions using mean differences (MD) or standardized mean differences (SMD) and 95% confidence intervals (95% CI). Where two or more studies provided data for an outcome, we carried out meta-analysis. In addition, we set and used a 15% threshold for calculation of clinically relevant differences.

**MAIN RESULTS:** We included 16 aquatic exercise training studies (N = 881; 866 women and 15 men). Nine studies compared aquatic exercise to control, five studies compared aquatic to land-based exercise, and two compared aquatic exercise to a different aquatic exercise program.We rated the risk of bias related to random sequence generation (selection bias), incomplete outcome data (attrition bias), selective reporting (reporting bias), blinding of outcome assessors (detection bias), and other bias as low. We rated blinding of participants and personnel (selection and performance bias) and allocation concealment (selection bias) as low risk and unclear. The assessment of the evidence showed limitations related to imprecision, high statistical heterogeneity, and wide confidence intervals. Aquatic versus controlWe found statistically significant improvements (P value < 0.05) in all of the major outcomes. Based on a 100-point scale, multidimensional function improved by six units (MD -5.97, 95% CI -9.06 to -2.88; number needed to treat (NNT) 5, 95% CI 3 to 9), self reported physical function by four units (MD -4.35, 95% CI -7.77 to -0.94; NNT 6, 95% CI 3 to 22), pain by seven units (MD -6.59, 95% CI -10.71 to -2.48; NNT 5, 95% CI 3 to 8), and stiffness by 18 units (MD -18.34, 95% CI -35.75 to -0.93; NNT 3, 95% CI 2 to 24) more in the aquatic than the control groups. The SMD for muscle strength as measured by knee extension and hand grip was 0.63 standard deviations higher compared to the control group (SMD 0.63, 95% CI 0.20 to 1.05; NNT 4, 95% CI 3 to 12) and cardiovascular submaximal function improved by 37 meters on six-minute walk test (95% CI 4.14 to 69.92). Only two major outcomes, stiffness and muscle strength, met the 15% threshold for clinical relevance (improved by 27% and 37% respectively). Withdrawals were similar in the aquatic and control groups and adverse effects were poorly reported, with no serious adverse effects reported. Aquatic versus land-basedThere were no statistically significant differences between interventions for multidimensional function, self reported physical function, pain or stiffness: 0.91 units (95% CI -4.01 to 5.83), -5.85 units (95% CI -12.33 to 0.63), -0.75 units (95% CI -10.72 to 9.23), and two units (95% CI -8.88 to 1.28) respectively (all based on a 100-point scale), or in submaximal cardiorespiratory function (three seconds on a 100-meter walk test, 95% CI -1.77 to 7.77). We found a statistically significant difference between interventions for strength, favoring land-based training (2.40 kilo pascals grip strength, 95% CI 4.52 to 0.28). None of the outcomes in the aquatic versus land comparison reached clinically relevant differences of 15%. Withdrawals were similar in the aquatic and land groups and adverse effects were poorly reported, with no serious adverse effects in either group. Aquatic versus aquatic (Ai Chi versus stretching in the water, exercise in pool water versus exercise in sea water)Among the major outcomes the only statistically significant difference between interventions was for stiffness, favoring Ai Chi (1.00 on a 100-point scale, 95% CI 0.31 to 1.69).

**AUTHORS' CONCLUSIONS:** Low to moderate quality evidence relative to control suggests that aquatic training is beneficial for improving wellness, symptoms, and fitness in adults with fibromyalgia. Very low to low quality evidence suggests that there are benefits of aquatic and land-based exercise, except in muscle strength (very low quality evidence favoring land). No serious adverse effects were reported.

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