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## Exercise Reduces Depressive Symptoms in Adults with Arthritis: Evidential Value

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### Abstract

**PURPOSE**—Determine whether evidential value exists that exercise reduces depressive symptoms in adults with arthritis and other rheumatic diseases.

**METHODS**—Using data from a previous meta-analysis of 29 published studies that included 2449 participants (1470 exercise, 979 control) with fibromyalgia, osteoarthritis, rheumatoid arthritis or systemic lupus erythematosus, a novel, recently developed method, p-curve, was used to assess for evidential value and rule out selective reporting of statistically significant findings regarding exercise and depressive symptoms in adults with arthritis and other rheumatic diseases. Using the method of Stouffer, z-scores were used to test for selective-reporting bias with alpha ( $p$ ) values  $\leq 0.05$  considered statistically significant. In addition, average power of the tests included in p-curve, adjusted for publication bias, was calculated.

**RESULTS**—Fifteen of 29 studies (51.7%) with exercise and depression results were statistically significant ( $p < 0.05$ ) while 73.3% had  $p$ -values  $< 0.025$ . None of the results were statistically significant with respect to exercise increasing depressive symptoms in adults with arthritis and other rheumatic diseases. Statistically significant right-skew to rule out selective reporting was found ( $z = -5.28$ ,  $p = 0.99$ ). The relative frequencies of  $p$ -values were 66.7% at 0.01, 6.7% each at 0.02 and 0.03, 13.3% at 0.04 and 6.7% at 0.05. The average power of the tests included in p-curve, corrected for publication bias, was 69%. Diagnostic plot results revealed that the observed power estimate was a better fit than the alternatives.

**CONCLUSION**—Evidential value results provide additional support that exercise improves depressive symptoms in adults with arthritis and other rheumatic diseases.

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There is a lack of evidential value regarding the effects of exercise on depressive symptoms in adults with arthritis and other rheumatic diseases.