Exercise for depression, a Cochrane Review[†]

COCHRANE CORNER

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Rationale

Depression is a common cause of morbidity and mortality worldwide. Depression is often treated with antidepressants or psychological therapy, or both, but some people may prefer alternative approaches such as exercise. This review updates one first published in 2008 and last updated in 2013.

Objectives

To determine the effectiveness of exercise in the treatment of depression in adults compared with no intervention, waiting list control or placebo, or where exercise is used as an adjunct to an established treatment that is received by both exercising and non-exercising groups.

To determine the effectiveness of exercise compared with other active interventions for depression in adults (psychological therapies, pharmacological treatments or alternative interventions such as light therapy).

Search methods

We searched the Cochrane Depression, Anxiety and Neurosis Review Group's Controlled Trials Register (CCDANCTR) to November 2013. We searched MEDLINE, Embase, PsycINFO and the Cochrane Central Register of Controlled Trials (CENTRAL) from 2013 to November 2023. No date or language restrictions were applied.

Eligibility criteria

We included randomised controlled trials (RCTs) in which exercise was compared to no treatment, inactive treatment or active treatment in adults (aged 18 years and over) with depression. We included trials that randomised individual participants or clusters. We excluded trials of postnatal depression. Two authors independently undertook study selection.

Outcomes

The primary outcome we assessed was a measure of depression or mood at the end of treatment and at any longer-term follow-up. Other outcomes were treatment acceptability, quality of life, cost and adverse events.

Risk of bias

We assessed the risk of bias using the Cochrane risk of bias tool RoB 1. Two authors independently performed the risk of bias assessment.

Synthesis methods

Two authors independently extracted data on outcomes at the end of the trial and end of follow-up (if available). We calculated effect sizes for each trial using Hedges' g method and a mean difference (MD) or standardised mean difference (SMD) for the overall pooled effect for continuous data, and risk ratios for dichotomous data. Where trials used a number of different tools to assess depression, we included only the main outcome measure in our meta-analyses. Where trials provided several 'doses' of exercise, we used data from the largest dose and performed sensitivity analysis using the lower dose. We performed subgroup analysis to explore the influence of diagnostic method, exercise intensity, number of exercise sessions, type of exercise and type of control (i.e. placebo, no treatment, waiting list, usual care and self monitoring). Through our sensitivity analyses, we explored the influence of study risk of bias.

Included studies

We included 73 RCTs (at least 4985 participants) in the review, 69 of which contributed data to our meta-analyses.

Synthesis of results

For the 57 trials (2189 participants) comparing exercise with no treatment or a control intervention, the pooled SMD for depressive symptoms at the end of treatment was −0.67 (95% confidence interval (CI) −0.82 to −0.52; low-certainty evidence), showing that exercise may result in a reduction in depressive symptoms. When we included only the seven trials (447 participants) with adequate allocation concealment, intention-to-treat analysis and blinded outcome assessment, the pooled SMD was smaller (SMD −0.46, 95% CI −0.88 to −0.04). Pooled data from the nine trials (405 participants) with long-term follow-up provided very uncertain evidence about the effect of exercise on depressive symptoms (SMD −0.53, 95% CI −1.11 to 0.06; very low certainty evidence).

Ten trials (414 participants) compared exercise with psychological therapy, finding there is probably little to no difference in their effect on depressive symptoms at the end of treatment (SMD 0.03, 95% CI −0.16 to 0.23; moderate-certainty evidence). There were similar results at long-term follow-up (SMD −0.11, 95% CI -0.48 to 0.26; 4 studies, 114 participants; low-certainty evidence).

Five trials (330 participants) compared exercise with pharmacological treatment, finding there may be little to no difference in their effect on depressive symptoms at the end of treatment (SMD −0.11, 95% CI −0.33 to 0.10; low-certainty evidence). The evidence was very uncertain at long-term follow-up (SMD −0.40, 95% CI −0.80 to 0.00; 1 study, 58 participants; very low certainty evidence).

There did not appear to be a difference between exercise and other interventions in terms of treatment acceptability, as measured by participants completing the study (moderate to low certainty evidence).

Results for the outcome 'quality of life' were inconsistent (low to very low certainty evidence).

Adverse events were not common in any comparison, but included musculoskeletal injuries and depression affecting those undertaking exercise, and diarrhoea, sexual dysfunction and fatigue reported by those receiving sertraline.

Many trials were affected by multiple sources of bias: randomisation was adequately concealed in only 22 studies, only 31 used intention-to-treat analyses, and only 23 used blinded outcome assessors. Blinding of those receiving and those delivering the interventions is inherently difficult; we judged all studies to be at high risk of performance bias. Many trials used participant self-report rating scales, which have the potential to bias findings.

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See Round the Corner in this issue.

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Authors' conclusions

Exercise may be moderately more effective than a control intervention for reducing symptoms of depression. Exercise appears to be no more or less effective than psychological or pharmacological treatments, though this conclusion is based on a few small trials. Long-term follow-up was rare.

The addition of 35 RCTs (at least 2526 participants) to this update has had very little effect on the estimate of the benefit of exercise on symptoms of depression. If further research is to take place, it should focus on improving trial quality, assessing which characteristics of exercise are effective for different people, and exploring health equity.

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