Working out depression: Is exercise effective for depression?

Clinical Question: Can exercise improve mild to moderate depression?

Bottom-Line: Exercise shows benefit in treating mild to moderate depression but the evidence is at a high risk of bias with smaller benefit in higher quality studies. In high quality studies showing benefit, approximately one in 8-12 patients with mild-moderate depression will attain remission due to exercise.

Evidence:
- At least 10 systematic reviews have been done.\(^1\)\(^-\)\(^10\) Focusing on four of highest quality in depression [13-58 randomized controlled trials (RCTs), 720-2,982 participants, usually mild-moderate depression].\(^1\)\(^-\)\(^4\)
  - Results in standard mean differences (SMD): A statistical tool to combine different scales with limited clinical meaning.
  - Effect on depression compared to no treatment or control: Three meta-analyses found statistically significant improvements in depressive symptoms, ranging from “moderate” to “large” effects (SMD 0.6 to 1.1).\(^1\)\(^,\)\(^2\)\(^,\)\(^4\) Results inconsistent.
    - In high quality studies:
      - Using randomization concealment, intention-to-treat and blinded assessors: Two meta-analyses were no longer statistically significant.\(^1\)\(^,\)\(^2\)
      - Using only publication in peer reviewed journal/dissertation: Remaining analysis: SMD reduced from 1.1 to 0.7 (now a “moderate” effect).\(^4\)
    - Duration reduced effect from “large” (SMD=1.8) in studies <8 weeks duration, to “moderate” (SMD=0.6) if >8 weeks.\(^4\)
    - Exercise not statistically different from psychotherapy (seven RCTs, 189 patients) or medication (four RCTs, 300 patients).\(^1\)
    - Limitations: Many studies used patient self-report for results;\(^1\)\(^,\)\(^4\) small sample sizes; exercise was usually supervised/done in groups (therefore socializing could effect results);\(^4\) blinding, randomization concealment, and intention-to-treat infrequent.
  - Examining the five highest quality RCTs:\(^11\)\(^-\)\(^15\) Three of five found statistically significant (or nearly):\(^11\)\(^,\)\(^12\)\(^,\)\(^15\)
• Response (≥30% reduction in Hamilton Depression score): Number Needed to Treat (NNT) 5 over 10 weeks.\textsuperscript{15}
• Remission (“normal” Hamilton Depression score): NNT 8-12 over four months.\textsuperscript{11}

**Context:**
- Exercise has dose-dependent, positive effects on quality of life in non-depressed patients.\textsuperscript{16}
- In chronic illness without depression, exercise has an inconsistent, small-moderate effect on depressive symptoms (SMD=0.3).\textsuperscript{9}
- Largest effects of exercise were observed among those with mild-to-moderate depression.\textsuperscript{8}
  - Evidence is insufficient to judge if one type of exercise is better.\textsuperscript{3,4}

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**References:**

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