

Impact of exercise training after bariatric surgery on cardiometabolic risk factors: a systematic review and meta-analysis of controlled trials

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Abstract

The purpose of this systematic review was to provide updated evidence synthesis of the effectiveness of exercise training in patients with obesity undergoing bariatric surgery to improve cardio-metabolic risk. We systematically searched the MEDLINE, EMBASE, Scopus, Cochrane, and Web of Science databases. The studies selected were those in which an exercise-based intervention was performed after bariatric surgery, a control group was present, and at least one of the following outcomes was investigated: VO_{2max} or VO_{2peak} , resting heart rate (RHR), blood pressure, lipid profile, glucose, and insulin. The study quality was assessed using the PEDro scale and the data were meta-analyzed with a random effects model, comparing control groups to intervention groups using standardized measurements. Twenty articles were included in the systematic review and fourteen (70%) in the meta-analysis. Significant differences were observed between the control and intervention groups (always in favor of exercise) for absolute VO_{2max} / VO_{2peak} (ES = 0.317; 95% CI = 0.065, 0.569; $p = 0.014$), $VO_{2max} /$ peak relative to body weight (ES = 0.673; 95% CI = 0.287, 1.060; $p = 0.001$), HDL cholesterol (ES = 0.22; 95% CI = 0.009, 0.430; $p = 0.041$) and RHR (ES = -0.438; 95% CI = -0.753, -0.022; $p = 0.007$). No effects were observed for either systolic or diastolic blood pressure. Exercise training for patients undergoing bariatric surgery appears to be effective in improving absolute and relative VO_{2max} / VO_{2peak} , HDL cholesterol and reducing the RHR. More intervention studies using (better) exercise interventions are needed before discarding their effects on other cardiometabolic risk factors. This systematic review and meta-analysis has been registered in Prospero (CRD42020153398).

Author keywords

Bariatric surgery
Blood pressure
Cardiovascular
Exercise training
 VO_{2max}

