



# A systematic review and meta-analysis of the effect of exercise on psychosocial outcomes in adults with obesity: A call for more research

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## ABSTRACT

**Background:** Reviews show that exercise reduces many obesity-related physical health problems. However, it is unclear whether those benefits extend to psychosocial outcomes. The aim of this review was to evaluate the effect of exercise on psychosocial outcomes in adults with obesity.

**Method:** Seven databases (Pubmed, Cochrane Library, EMBASE, CINAHL, Psycarticle, SportDiscus, Proquest) were searched until October 2017 to identify relevant studies published in peer-reviewed journals. Two reviewers independently screened articles against the following inclusion criteria: used an experimental or quasi-experimental design, involved adults with a body mass index  $\geq 30$  kg/m<sup>2</sup>, delivered an intervention consisting of supervised or semi-supervised exercise, and assessed quality of life (QoL), depression, anxiety, and/or body image as outcomes.

**Results:** Twenty two articles were included in this review; 16 were randomized controlled trials (RCT). Most interventions were supervised and lasted  $\leq 16$  weeks. Meta-analysis of RCTs with available data on QoL ( $k=7$ ) and depression ( $k=4$ ) did not show that exercise was significantly superior to control conditions for physical QoL ( $g=0.16$ , 95%CI [-0.05,0.37]), mental QoL ( $g=0.20$ , 95%CI [-0.09,0.48]), or depression ( $g=-0.26$ , 95%CI [-0.70,0.19]). Only three studies reported data on anxiety and body image. **Conclusions:** Current evidence does not suggest exercise is successful in significantly enhancing psychosocial health in adults with obesity. Limitations associated with the reviewed studies could have biased the results toward a lack of effect. Additional high-quality RCTs are needed to improve evidence-based knowledge.

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## Contents

1. Introduction .....	2
2. Methods .....	2
2.1. Protocol and registration .....	2
2.2. Eligibility criteria .....	3
2.3. Information sources .....	3
2.4. Search and study selection .....	3
2.5. Data extraction .....	3

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2.6.	Risk of bias	3
2.7.	Statistical analysis	3
3.	Results	3
3.1.	Study selection	3
3.2.	Study characteristics	3
3.3.	Exercise interventions	4
3.4.	Risk of bias	7
3.5.	Findings for QoL	7
3.5.1.	RCTs	7
3.5.2.	Meta-analysis of RCTs	7
3.5.3.	CCTs and before-and-after studies	7
3.6.	Findings for depression	8
3.6.1.	Meta-analysis of RCTs	8
3.7.	Findings for anxiety and body image	8
4.	Discussion	8
4.1.	Summary of evidence	8
4.2.	Strengths and limitations of this review	8
4.3.	Recommendations for future research	8
4.4.	Conclusion	9
	Funding	9
	Conflicts of interest	9
	Acknowledgements	9
	Supplementary data	9
	References	9

## 1. Introduction

Adults with obesity are at increased risk for several serious diseases and health conditions (e.g., type 2 diabetes, cancers, mood disorders) (Dixon, 2010; Guh et al., 2009; Luppino et al., 2010; Scott, McGee, Wells, & Browne, 2008; Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). They may also have impaired physical and psychological functioning (Dixon, 2010; Guh et al., 2009; Luppino et al., 2010; Scott et al., 2008; Wang et al., 2011), negative body image, and poor quality of life (QoL) (Ul-Haq, Mackay, Fenwick, & Pell, 2013; Weinberger, Kersting, Riedel-Heller, & Luck-Sikorski, 2016).

Scholars have focused on the role of exercise in preventing and treating obesity in adults. Evidence from individual studies has been summarized in reviews and shows that adults with obesity who exercise regularly can lose weight (Donnelly et al., 2009; Janiszewski & Ross, 2007; Swift, Johannsen, Lavie, Earnest, & Church, 2014). The role of exercise in reducing the risk for several physical health conditions in adults with obesity has also been examined. The evidence shows that exercise can improve body composition, cardiovascular biomarkers, and insulin resistance in adults with obesity, irrespective of weight loss (Donnelly et al., 2009; Janiszewski & Ross, 2007). In addition, numerous meta-analyses demonstrate that exercise can be used to prevent or treat mood disorders (i.e., depression, anxiety) improve QoL, and reduce negative body image in non-clinical and clinical populations (Bartley, Hay, & Bloch, 2013; Bridle, Spanjers, Patel, Atherton, & Lamb, 2012; Buffart et al., 2017; Campbell & Hausenblas, 2009; Chen & Rimmer, 2011; Chou, Hwang, & Wu, 2012; Ekkekakis, 2015; Fukuta, Goto, Wakami, & Ohte, 2016; Herring, O'Connor, & Dishman, 2010; Herring, Puetz, O'Connor, & Dishman, 2012; Rebar et al., 2015; Wipfli, Rethorst, & Landers, 2008). This finding is particularly relevant because prevention and treatment of obesity should not only focus on reducing weight, but should also seek to enhance adults' subjective well-being in the era of patient-centered health care because many adults may still experience depression, poor QoL, and negative body image after weight loss. Yet, evidence regarding the effect of exercise on these outcomes is

less conclusive in adults with obesity based on a recent systematic review (Baker, Sirois-Leclerc, & Tulloch, 2016), whereby the authors reported no evidence concerning the benefits of exercise on QoL, and mood disorders (i.e., depression, anxiety) in overweight and obese postmenopausal women. However, not all studies examining the effect of exercise on psychosocial outcomes were included in the review given the restricted population inclusion criteria, therefore limiting our ability to draw generalizable conclusions. Thus, the objective of this systematic review and meta-analysis was to provide an evaluation of the effect of exercise on four key psychosocial outcomes in adults with obesity, identify knowledge gaps, and highlight areas in need of additional research. Considering there is no unanimous agreement on which psychosocial outcomes are the most important to assess in adults with obesity, we chose to focus on QoL, depression, anxiety, and body image because: (1) QoL is an important patient-reported outcome that should be examined when assessing the effects of therapeutic interventions (Fontaine & Barofsky, 2001; Kolotkin, Meter, & Williams, 2001), (2) depression and anxiety are prevalent mood disorders in this population and are a leading cause of disability (Carpiniello et al., 2009; Rajan & Menon, 2017), (3) adults with obesity are at increased risk of body image issues due to high societal pressures (Latner, Barile, Durso, & O'Brien, 2014; Puhl & Heuer, 2009), (4) many adults still experience negative body image after weight loss (Foster, Wadden, & Vogt, 1997; Gilmartin, 2013; Schwartz & Brownell, 2004), and (5) mood disorders, body image, and QoL affect sex life, self-esteem, and social function (Fontaine & Barofsky, 2001; Lillis, Levin, & Hayes, 2011; Puhl & Heuer, 2009).

## 2. Methods

### 2.1. Protocol and registration

This review was undertaken following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). The protocol was registered in PROSPERO (CRD42016036510).

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