

## Exercises in Treatment of Obesity in Children: Fitness Amidst Fatness: A Special Overview of Reviews

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### Abstract

This short communication was intended to provide an overview of published reviews in PubMed to assimilate the existing evidence for exercises in pediatric obesity. The existing evidence demonstrated positive effects of exercise training on body composition, haemodynamic and metabolic variables, cardiovascular fitness, muscular strength and vascular function in pediatric obesity, and also recommended that aerobic exercise (60 min, 3 times/week, at 75% maximum heart rate) improved lipid profile in obese children.

**Keywords:** pediatric endocrinology; childhood obesity; pediatric obesity; pediatric rehabilitation.

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This short communication was intended to provide an overview of published reviews in PubMed to assimilate the existing evidence for exercises in pediatric obesity.

Epstein et al<sup>1</sup> identified 13 controlled outcome studies and their findings supported the continued use of exercise in combination with diet for child and adolescent obesity treatment, but the limited number of controlled studies indicated the need for more research in the area.

Escalante et al<sup>2</sup> in their systematic review searched seven databases and identified six RCTs and one CCT that evaluated efficacy of exercise interventions on the lipid profile (high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), total cholesterol (TC), and triglycerides (TG)) of obese children. The authors provided following conclusions; "The programs based on aerobic exercise alone have a moderate and a large effect on LDL-C and TG concentrations, respectively; and the programs based on combined exercise have a moderate effect on HDL-C concentration." The study findings recommended that aerobic exercise (60 min, 3 times/week, at 75% maximum heart rate) to improve the

LDL-C and TG concentrations. In addition, the programs based on combined exercise (at 60 min, >75% maximum heart rate) also may improve the HDL-C concentration.

McCall and Raj<sup>3</sup> reviewed randomized, controlled trials in children, using exercise and lifestyle modification in the prevention of insulin resistance and obesity. The included trials have provided valuable insight into the efficacy of various approaches toward preventing childhood obesity and insulin resistance.

Stabouli et al<sup>4</sup> summarized previous studies on the role of obesity, salt intake and exercise on BP in children and adolescents. "Several studies support that sympathetic nervous system imbalance, impairment of the physiological mechanism of pressure natriuresis, hyperinsulinemia and early vascular changes are involved in the mechanisms causing elevated BP in obese children and adolescents. Under the current evidence on the association of salt intake and BP, dietary sodium restriction appears to be a rational step in the prevention of hypertension in genetically predisposed children and adolescents. Finally, interventional studies show that regular aerobic

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exercise can significantly reduce BP and restore vascular changes in obese with hypertensive pediatric patients.”

Watts et al<sup>5</sup> evaluated the effect of exercise training in obese children and adolescents on body composition, haemodynamic and metabolic variables, cardiovascular fitness, muscular strength and vascular function through a review of literature. These studies indicated that, although exercise training does not consistently decrease bodyweight or body mass index, it was associated with beneficial changes in fat and lean body mass, emphasizing the importance of comprehensive assessment of body composition in future exercise-training studies. Exercise training improves cardiovascular fitness and muscular strength; however, it seems to have little effect on blood lipid profile or blood pressure in obese young people. Importantly, recent studies have demonstrated that exercise training improves vascular endothelial function, an important surrogate measure that may predict future atherosclerotic risk in obese children and adolescents. Given that improvement in vascular function in these training studies occurred in the absence of changes in lipid fractions, haemodynamic variables or glucose metabolism, exercise appears to have a direct beneficial effect on the vasculature, in addition to its putative benefits through risk-factor modification.”

Zanconato et al<sup>6</sup> studied 23 obese children, and 37 normal-weight children, matched for sex, age and height, who performed a maximal exercise test on a treadmill. Ventilatory anaerobic threshold (VAT) expressed in ml O<sub>2</sub>/min per kg and as a percent of maximal oxygen uptake (% VO<sub>2</sub>max) was lower in the obese than in the normal-weight children. The

habitual level of physical activity was lower in the obese subjects compared to the control subjects.

The existing evidence demonstrated positive effects of exercise training on body composition, haemodynamic and metabolic variables, cardiovascular fitness, muscular strength and vascular function in pediatric obesity, and also recommended that aerobic exercise (60 min, 3 times/week, at 75% maximum heart rate) improved lipid profile in obese children.

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