

ORAL PRESENTATION OP9

Effects of Three Different Type of Exercise Training on Cardiorespiratory Fitness in Type 2 Diabetes Population: A Systematic Review and Meta-Analysis

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ABSTRACT

Background and Objectives: Reduced cardiorespiratory fitness (CRF), commonly assessed via maximal oxygen uptake (VO_2max), is a strong predictor of cardiovascular risk and mortality in individuals with type 2 diabetes (T2DM). While exercise is recommended, the comparative effectiveness of aerobic, resistance, and concurrent training on CRF in this population remains unclear. This study aimed to evaluate the effects of different exercise modalities on VO_2max in adults with T2DM. **Methods:** A systematic review and meta-analysis were conducted following PRISMA guidelines. Electronic databases (PubMed, Web of Science, and Scopus) were searched from January 1980 to October 2025 for randomized controlled trials involving structured exercise interventions in T2DM. Interventions were categorized into aerobic, resistance, and concurrent training, compared against non-exercise controls. **Results:** Forty-nine trials were included, (exercise: $n=1,284$; control: $n=1,157$). Exercise significantly improved VO_2max when compared to control (SMD=0.64, 95% CI 0.56–0.73; $p<0.00001$), with no heterogeneity ($I^2=0\%$). Subgroup analyses revealed comparable moderate improvements following aerobic (SMD=0.67) and concurrent training (SMD=0.67), while resistance training produced a significant but smaller effect (SMD=0.46). The consistency across studies indicates a robust and reproducible effect of exercise on CRF. **Conclusion:** Exercise training substantially improves VO_2max in individuals with T2DM, with aerobic and concurrent modalities demonstrating the greatest effects. Despite differing physiological mechanisms, all exercise types yield meaningful improvements in CRF.

Keywords: Aerobic training; Cardiorespiratory fitness; Concurrent Training; Resistance Training; Type 2 Diabetes

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