

ABSTRACT

Understanding how different types of exercise impact physiological responses is essential for designing effective and safe training programs or occupational settings. This study aims to compare heart rate (HR) and oxygen consumption (VO_2) during aerobic (treadmill) and anaerobic (weightlifting) exercises across varying intensities. A total of nine participants with similar fitness levels performed both exercises under controlled conditions, each at low, medium, and high intensity. Heart rate was measured using an optical HR sensor, while VO_2 was estimated using validated metabolic equations. The Brouha method was applied to determine rest period required based on cardiovascular recovery. Results indicated that aerobic exercise produced significantly higher HR and VO_2 values compared to anaerobic exercise, particularly at higher intensities. HR and VO_2 also increased proportionally with intensity, with treadmill exercise consistently requiring longer rest periods. These findings suggest that aerobic activities place higher demands on cardiovascular, while anaerobic exercises produce shorter recovery times but may contribute to muscular fatigue. In conclusion, the study shows that exercise type and intensity significantly influence physiological responses, highlighting the usefulness of wearable HR sensors and metabolic formulas in monitoring training load. These insights can help individuals and professionals tailor exercise or occupational settings more precisely to optimize performance and minimize risk.

Keywords: Brouha method, Heart rate, Physiological responses, Treadmill exercise, VO_2 , Weightlifting