
High-Intensity Interval Training Performed by Young Athletes: A Systematic Review and Meta-Analysis

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Setting the scene:

To assess original research about enhancement of endurance and anaerobic exercise performance in young and adolescent athletes performing High-Intensity Interval Training (HIIT).

What did they do?

Twenty four studies, involving 577 athletes (mean age: 15.5 ± 2.2 years), were included in this review. HIIT exerted no or small positive mean ES on peak oxygen uptake (VO_{2peak}), running performance, repeated sprint ability, jumping performance and sub-maximal heart rate. Although the mean ES for changes in VO_{2peak} with HIIT is small (mean $g = 0.10 \pm 0.28$), the average increase in VO_{2peak} from pre to post HIIT-interventions were $7.2 \pm 6.9\%$ vs. $4.3 \pm 6.9\%$ with any other alternative intervention. HIIT largely and positively affected running speed and oxygen consumption at various lactate- or ventilatory-based thresholds, as well as for sprint running performance. Calculations showed negative mean ES for change-of-direction ability (large), and peak blood lactate concentrations (small). Mean duration per training session for HIIT was shorter than for control interventions (28 ± 15 min vs. 38 ± 24 min).

Takeaway message:

The present findings suggest that young athletes performing HIIT may improve certain important variables related to aerobic, as well as anaerobic, performance. With HIIT, most variables related to endurance improved to a higher extent, compared to alternative training protocols. However, based on ES, HIIT did not show clear superiority to the alternative training protocols. Nevertheless, young athletes may benefit from HIIT as it requires less time per training session leaving more time for training sport specific skills.