

Combining Resistance and High-Intensity Interval Training on Sleep Indexes and Vascular
Function in Obese Children with Obstructive Sleep Apnea

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Abstract

Introduction: The effects of high intensity interval training (HIIT) combined with resistance training (RT) on sleep indices and vascular function in obese children with obstructive sleep apnea (OSA) is unknown. Thus, this study aimed to examine the effects of HIIT combined RT in obese children with OSA.

Methods: Forty-four obese children with OSA, aged 7-18 years assigned into 2 groups: exercise group (n=22) received an exercise program plus usual care and control group (n=22) received usual care alone. The exercise group received a 24-min HIIT (>60% HRR) and 20-min RT (50-80% 1RM), 3-day a week for 8-week. Outcome measures were sleep indexes included polysomnography (PSG) indices and SRBD-Pediatric Sleep Questionnaire (SRBD-PSQ), and vascular function comprised of flow-mediated dilation (FMD) and blood flow velocity.

Results: At post-intervention, the exercise group had a significant decrease in the total score of the SRBD-PSQ ($P < 0.05$), but no change in PSG indices and vascular function (all $P > 0.05$) compared to controls. At 8-week follow-up, the total score of the SRBD-PSQ, some PSG indices i.e., AHI and ODI, and blood flow velocity were significantly improved in the exercise group compared with peers (all $P < 0.05$). There were no changes in SaO_2 nadir and mean SaO_2 of PSG indices between groups (all $P > 0.05$).

Conclusion: Eight-week of HIIT plus RT could alleviate OSA-related symptoms in obese children with OSA, which the effect remained over 8-week follow-up. The PSG indices and vascular function were enhanced only at follow-up.

Keywords: High intensity interval training, Resistance training, PSG indices, Obstructive sleep apnea