

Resistance Training Is Associated With Higher Bone Mineral Density Among Young Adult Male Distance Runners Independent of Physiological Factors

Duplanty, A., Levitt, D., Hill, D., Mcfarlin, B., Dimarco, N., & Vingren, J. (2018). Resistance Training Is Associated With Higher Bone Mineral Density Among Young Adult Male Distance Runners Independent of Physiological Factors. *Journal of Strength and Conditioning Research*, 32(6), 1594-1600.

<https://doi.org/10.1519/JSC.0000000000002504>

Abstract

Low bone mineral density (BMD) in male distance runners is common and could be modulated by a host of biomarkers involved in the dynamic balance of bone tissue. In contrast, resistance training can increase BMD; however, the efficacy of resistance training in protecting BMD in distance runners has not been elucidated. The aim of this study was to investigate the relationship between resistance training, testosterone and bone metabolism biomarker concentrations, and BMD in young adult male distance runners. Twenty-five apparently healthy men (23–32 years; mean \pm SD: 25.9 \pm 2.9 years; 1.77 \pm 0.04 m; 75.4 \pm 8.5 kg) were categorized into 1 of 3 groups: untrained control participants (CON; n = 8); nonresistance-trained runners (NRT; n = 8); or resistance-trained runners (RT; n = 9). Blood was collected and analyzed for concentrations of free and total testosterone and 14 bone metabolism biomarkers. Bone mineral density was assessed using dual-energy X-ray absorptiometry. At all measured sites, BMD was greater ($p \leq 0.05$) for RT compared with NRT and CON. Vitamin D concentration was greater ($p \leq 0.05$) in RT and NRT compared with CON. Concentrations of testosterone and remaining bone biomarkers did not differ between groups ($p > 0.05$). Resistance-trained runners had greater BMD than nonresistance-trained runners and untrained peers. This difference did not seem to be modulated by biomarkers that contribute to bone formation or resorption, indicating that differences in BMD are associated with habitual load-bearing exercise using external resistance. Runners should perform resistance exercise at least once per week because this is associated with greater BMD.