

Abstract



Effects of a Supplementary Strength-Power Training Program on Neuromuscular Performance in Young Female Athletes ⁺

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Abstract: AIM: This study examined the effects of a high-intensity, short-duration supplementary strength-power training program on neuromuscular performance and sport-specific skills of young female "Gymnastics for All" athletes. MATERIAL & METHOD: Twenty-four female "Gymnastics for all" athletes aged 13 ± 2 years, with at least two years of competitive-level training experience, took part in this study. Participants were divided into training (TG, n = 13) and control groups (CG, n = 11), who completed the same 3-day per week gymnastics training program over 10 weeks, with the TG completing a supplementary 7–9 min long strength-power program at the end of each training session. This training program consisted of two rounds of strength and power exercises for arms and legs, executed in a circuit fashion with 1-min rest between rounds. The exercises used included plyometrics for upper and lower body using body weight resistance, as well as strengthpower exercises using elastic bands and light kettle bells. Participants performed each exercise at maximum voluntary effort, as fast and as hard as possible. Initially, six different exercises were performed per round (15 s work and 15 s rest), while the number of exercises per round was gradually decreased to four and the duration of each exercise was increased to 30 s (with 30 s rest). Data were analyzed using mixed-model 2-way ANOVA (group × time). RESULTS: After 10 weeks of training the TG improved countermovement jump performance with one leg (by $11.9 \pm 2.8\%$, p =0.001) and two legs (by 7.1 \pm 2.7%, *p* = 0.026), drop jump performance (by 11.9 \pm 2.8%, *p* = 0.002), single-leg jumping agility (by $12.9 \pm 1.5\%$, p = 0.001), sport-specific performance, i.e., repeated rondats (by 8.2 \pm 2.1%, p = 0.004), but not 10-m sprint performance (2.5 \pm 1.7%, p = 0.23). There was no change in these neuromuscular performance parameters in the CG (p = 0.13 to 0.94). **CONCLUSIONS:** The results of this study show that this supplementary strength-power program performed for only 7–9 min at the end of each session improved neuromuscular and sport-specific performance after 10 weeks of training.

Keywords: adolescent athletes; high-intensity training; plyometric training; resistance training



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