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Analysis of isometric strength and force-velocity relationship after 7 weeks of stable and unstable training on partial push up

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Training with instability device seems to have useful adaptaments, but not all the autor confirm it. Instability training shows increase muscle activation due to the needed for stabilization. The increased stress associated with instability training has been postulated to promote greater neuromuscular adaptations, such as decreased co-contractions, improved intra and inter-coordination and set a lower stress on joint and muscle that can beneficial for musculoskeletal healt and rehabilitation. The aim of the research was to find the difference related in strength gain between an exercise under stable and unstable condition. Two groups of healty-fitness people follow a 7 weeks of stable and unstable training on partial push-up. The control group (CG) ($n = 4$, one female and three males, 25.0 ± 3.9 y) performed the push-up with hands on the floor, while the sperimental group (SG) ($n = 7$, two females and five males, 24.6 ± 2.3 y) performed push-up with hands on a Swissball. The execution time, the total volume and the articular ROM were standardized. The tests were: (1) a standardized isometric chest press and (2) force-velocity relationship of the chest muscle. For statistical analysis has been used the Wilcoxon matched-pairs signed rank test. The isometric strength has a positive correlation with the instability training ($p < 0.05$) while the force-velocity relationship hasn't got ($p > 0.05$). Instability training seems to show best adaptations on isometric strength, probably due to neural adaptations, while it seems that it doesn't happen in force-velocity relationship, probably due to the standardized time of execution.

Reference:

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Keywords
Isometric strength, force-velocity relationship, instability training, neuromuscular adaptations