

Abstract

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Title: The Effect of Weight Manipulation on Physical Performance in Combat Sports

Objectives: To assess the effect of rapid weight loss and rapid weight gain on strength and to assess the effect of rapid weight loss on health biomarkers.

Methods: A total of 19 full-contact combat sports athletes participated in this study and underwent a 7-day period of intentional rapid weight loss, resulting in 5% loss of their initial body weight. Subsequently, within two hours, they regained 2.6% of their body weight. To assess the effect of this rapid weight manipulation, we employed a comprehensive battery of isometric, dynamic, and anaerobic tests to measure the strength-related abilities and body composition (before rapid weight loss, after rapid weight loss and after rapid weight gain). Furthermore, we monitored the hydration status throughout the study using diagnostic strips. The participants also completed a series of purpose-specific questionnaires.

Results: In the condition after rapid weight reduction, we observed statistically significant decrease in the maximal isometric strength of the left knee flexors, maximal explosive strength of the upper and lower extremities, and a statistically significant decline in the hydration status of the participants.

In the condition after rapid weight gain (compared to the state before rapid reduction), we observed statistically significant decrease only in the maximal isometric strength of the upper extremities and anaerobic performance.

Conclusion: In our sample, rapid weight reduction had a statistically significant negative effect on several strength tests and hydration levels. After rapid weight gain, we observed statistically significant changes in only two of the conducted tests. Overall, the five percent rapid weight reduction had negative impact on strength, yet the observed effect was small.

Keywords: Explosive strength; isometric; power; anaerobic performance; counter-movement jump; rapid weight gain; urine specific gravity; hydration status; Upper-limb Wingate test; body composition.