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In-season autoregulation of one weekly strength training session maintains physical performance in professional male football players

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INTRODUCTION:
While studies have tested different autoregulation methods within the competitive season (1), the use of typical monitoring tools such as GPS-tracking systems and external load performance data, seem to be unexplored. The aim of this study was therefore to compare the effects of autoregulating strength training volume based on an objective (external load match performance) versus a subjective (self-selected) method in professional male football players in-season.
METHODS:
Sixteen players were randomly assigned to an external load regulated (EXL: n=7, 24.1±4.7 yrs, 181.4±5.1 cm, 76.6±7.1 kg) or a self-selected (SELF: n=9, 23.7±3.9 yrs, 185.0±6.9 cm, 77.4±8.4 kg) group and completed a 10-week in-season strength intervention period. The EXL-group regulated strength training volume based on their high intensity running (HIR: >19.8 km/h) distance from preceding football matches, and performed 3, 2 or 1 set of each exercise, based on thresholds of <421m, between and >687m, respectively. SELF-group was instructed to reflect on their subjective feeling and readiness to train, and select the number of sets based on their subjective rating of readiness. Physical performance (30-m sprint, countermovement jump, leg-strength) and body composition (DXA) were assessed pre- and post-intervention period.
RESULTS:
No significant differences were observed between the groups at baseline. During the 10-week intervention period, both groups performed 1.1±0.1 bout of ~6 sets in leg extensor exercises and Man-Whitney U test revealed no group differences (p>0.05) in training volume (number of strength-training sessions, or number of sets in leg extensor exercises completed). No group differences were detected in physical performance and body composition measures post-intervention. Wilcox signed rank test showed that no significant pre- to post differences were evident in the physical performance measures for either group, or when analyzing all players as one group. For body composition, a statistically higher leg mass and legs lean mass was shown at post- compared to pre-test, for the EXL-group (0.4±0.4kg, p=0.031 and 0.4±0.3, p=0.034) and when analyzing all players as one group (0.3±0.6kg, p=0.039 and 0.2±0.6kg, p=0.024).
CONCLUSION:
Our findings demonstrated that an objective autoregulation of strength training volume based on football match HIR distance did not differ from using a self-regulation based on their subjective readiness to train during a 10-week intervention period. This is likely explained by a low, and similar volume in the strength training undertaken. This study demonstrates that one-weekly in-season strength training session with ~6 sets of leg extensor exercises, applied by either an objective or subjective autoregulation method, can maintain professional football players physical performance during a competitive period.

1. Zhang et al. (2021). Frontiers in Physiology.

Topic: Training and Testing

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