THE IMPACT OF A COMPETITIVE SEASON ON JUMPING PERFORMANCE AND BODY COMPOSITION IN DIVISION 1 MALE VOLLEYBALL ATHLETES

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Introduction

Jumping performance is crucial for successful volleyball competition. As in-season training shifts from strength training to skill development on the court, few studies have monitored jumping performance and body composition throughout the season in Division I collegiate male volleyball players..

Purpose

Evaluate the impact of the NCAA collegiate volleyball season on jumping performance and body composition.

Methods

Seventeen NCAA Division I male volleyball players participated in this 16-week longitudinal study. Participants were tested 3 times: end of the preparation period (PP) (Week 0), bye-week (BW) (Week 10), and conclusion of competitive period (CP) (Week 17). Jump performances were measured using photocells. Jump tests included attack jump, step approach jump, and block jump. Lower body power index (LBPI) was measured by four repeated vertical jumps. Body composition was analyzed using Dual-energy X-ray absorptiometry (DXA). Measures of interest were lean tissue mass, fat tissue percentage, LBPI, jump height during attack jump, step approach jump, and block jump. A series repeated measure ANOVAs were used for statistical analyses.

Results

Fat tissue percentage changed over the course of the season ($F = 10.242$; $p < 0.001$; $\eta p2 = 0.390$). Follow up analyses indicated a statistical difference between PP and BW (Cohen's d = 0.214, 95%CI [0.496,1.834]; $p < 0.001$), and BW and CP (Cohen's d = -0.104, 95%CI [-1.137, .008]; p = 0.036). See Figure1.

Block jump height differed over the course of the season ($F = 5.698$; $p = 0.008$; $\eta p2 = 0.263$). Follow up analyses indicated difference between PP and CP (Cohen's d = -0.611, 95%CI [-3.476, -0.089]; p = 0.038). See Figure 2.

No statistical difference was noted in lean tissue mass.

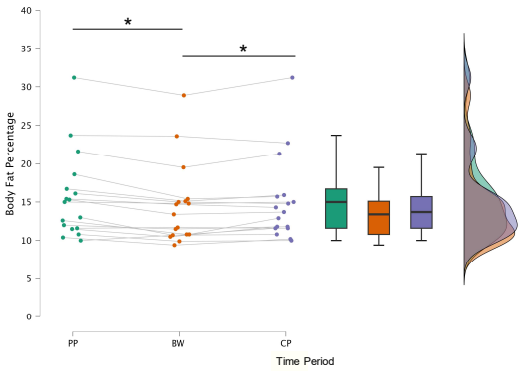

Figure 1. Differences in fat percentage by time point

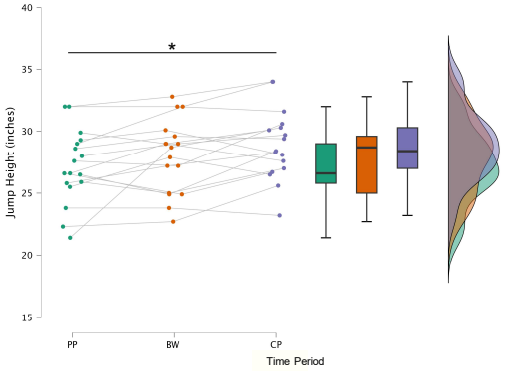

Figure 2. Differences in jump height by time point

Results

Attack jump height changed over the course of the season ($F = 4.426$; $p = 0.020$; $\eta p2 = 0.217$). Follow up analyses indicated a difference between PP and BW (Cohen's d = 0.412, 95%CI [-6.684, -1.469]; p = 0.002).

LPBI changed throughout the season ($F = 7.870$; $p = 0.002$; $\eta p2 = 0.330$). Follow up analyses indicated a difference between PP and CP (Cohen's d = -0.774, 95%CI [-0.487, -0.044]; p = 0.016), and BW and CP (Cohen's d = -0.533, 95%CI [-0.356 - -0.010]; p = 0.025). See Figure 3.

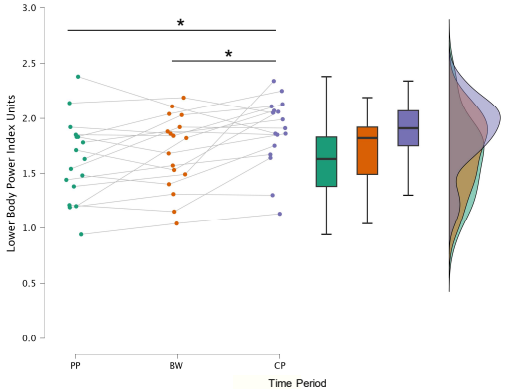

Figure 3. Differences in LBPI by time point

Conclusion

Athletes maintained or improved jump performance over the competitive season. The season impacted fat tissue percentage but not lean tissue mass.

Practical Application

Partitioners may desire to modify training programs aimed at lower body power and jump performance depending on the time of the competitive season. Practitioners may consider implementing approaches to offset fat tissue changes that appear to occur throughout the season.