



# Effect of Game Frequency on CMJ Performance of Division I Female Soccer Players

## Soccer Players

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### INTRODUCTION

Throughout most of a collegiate soccer season teams play 1 to 2 games a week. However, with tournaments and makeup games teams can be forced to play 3 games within a week. It is important for coaches and staff to understand the effects this additional load may have on their athletes.

### PURPOSE

The purpose of this study was to investigate the effects of game frequency on countermovement jump (CMJ) metrics in Division I female soccer players.

### METHODS

Fourteen Division I female soccer athletes (age=19.50 ± 1.23 years) completed CMJs on force plates once per week throughout the season. Athletes were selected based on their availability and health status during the season. Three test dates throughout the season were chosen to be analyzed for this study. Test date one (T1) followed a week which consisted of only one game. Test date two (T2) followed a week consisting of two games. Test date three (T3) followed a week consisting of three games. Testing sessions were performed 2-3 days after the final game. During each testing session, athletes were instructed on proper CMJ mechanics prior to testing, which involved a rapid countermovement of self-selected depth followed by a maximal vertical jump with the arms akimbo throughout the entire movement. Each athlete performed three attempts of the CMJ on the force plates during each testing session. Jump height (JH), concentric peak power (CPP), eccentric peak power (EPP), and modified reactive strength index (RSI-mod) were recorded for each repetition. CPP and EPP were both normalized for body mass. For each athlete, the attempt with the highest JH for each testing session was utilized for analysis. Repeated measure analyses of variance were performed to analyze the difference of these metrics among all three testing sessions.

- Significant interaction between relative concentric peak power and game frequency
- No significant interaction between eccentric peak power, jump height, and RSI-mod for game frequency

### RESULTS

There was a significant interaction for CPP, such that T3 was significantly less than T2 ( $p = 0.004$ ). There were no significant differences among the three game frequencies for JH, EPP, or RSI-mod ( $p \geq 0.05$ ).

### CONCLUSIONS

Increased game frequency of 3 games per week significantly decreased concentric peak power in Division I female soccer players compared to 2 games per week. A significant decrease in CPP suggests a possible decrease in both force output and velocity since power can be calculated as the product of force and velocity. Nevertheless, it appears that frequency of games has little overall impact on CMJ performance.

### PRACTICAL APPLICATIONS

This study suggests an increase in game frequency, particularly from two to three games per week, may inhibit athlete performance, assessed via CPP. This highlights the importance of load monitoring and performance monitoring for collegiate female soccer athletes. With power production being a key aspect of soccer performance, these findings highlight the importance of power, and likely power endurance training for collegiate female soccer players to ensure proper maintenance of performance following high intensity weeks. Coaches and practitioners may implement specific training to decrease fatigue prior to weeks with multiple games or potentially different tactics or increase substitutions during games to maintain performance levels of athletes during high game frequency weeks. However, with the lack of changes in JH, EPP, and RSI-mod, further research is needed to determine how fatigue or performance changes are best monitored for this population.

