

# VOLLEYBALL OVERHEAD SWING VOLUME AND INJURY FREQUENCY OVER THE COURSE OF A SEASON

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## ABSTRACT

**Background:** Overuse injuries are common in volleyball; however, few studies exist that quantify the workload of a volleyball athlete in a season. The relationship between workload and shoulder injury has not been extensively studied in women's collegiate volleyball athletes.

**Hypothesis/Purpose:** This study aims to quantify shoulder workloads by counting overhead swings during practice and matches. The purpose of the current study is to provide a complete depiction of typical overhead swings, serves, and hits, which occur in both practices and matches. The primary hypothesis was that significantly more swings will occur in practices compared to matches. The secondary hypothesis was that greater swing volume and greater musculoskeletal injury frequency will occur in the pre-season than during the season.

**Study Design:** Prospective cohort

**Methods:** Researchers observed practice and match videos and counted overhead serves and attacks of 19 women's collegiate volleyball players for two seasons. Serves, overhead hits, and total swings (serves + hits) were the dependent variables; event (matches and practice) along with position (defensive specialists, setter, outside hitter, and middle blocker) were the independent variables. Musculoskeletal injury frequency and swing volume workload were compared across pre-season and competitive season time periods.

**Results:** Across all positions except outside hitters twice as many total swings occurred in practices compared to matches ( $p = .002$ ) resulting in an average of 19 ( $CI_{95}$  16.5, 21.5) more swings in practice than in matches. The average number of total swings during the pre-season 47.1 ( $CI_{95}$  44.1, 50.1) was significantly greater than average swings per session during the competitive season 37.7 ( $CI_{95}$  36.4, 38.9) ( $p < 0.001$ ) resulting in a mean difference of 9.4 ( $CI_{95}$  6.1, 12.7) swings. The number of athletes limited in participation or out due to a musculoskeletal injury during the pre-season (2.9%) was greater than during the season (1.1%) ( $p = 0.042$ ).

**Conclusion:** These findings support the primary hypothesis that women's collegiate volleyball athletes swing more during practices than in matches. The higher average number of serves in the pre-season and the greater frequency of musculoskeletal injuries requiring participation restriction or removal from participation suggest that a concordant relationship may exist between workload and injury variables.

**Level of Evidence:** 2

**Keywords:** Attack, overuse, shoulder, volume, volleyball serve

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