

Introduction

- ❖ Strength and Conditioning coaches aim to develop well-rounded athletes through movement-specific training programs.
- ❖ Recommendations often emphasize general drills and the application of sports-specific movements.
- ❖ Blocking in volleyball is a crucial component of volleyball defense that requires the right combination of time to take off and jump height.
- ❖ Players must react quickly and be explosive in their jump to reach the ball at its highest point and deflect the ball.
- ❖ Several types of block jumps are used during a volleyball game, but little research investigates how different block techniques impact kinematics and kinetics performance metrics.

Purpose

- ❖ The study aimed to analyze the differences in kinematics and kinetics variables among three common block jumps used in volleyball games: shuffle block (SB), chicken wing block (CWB), and swing block (SWB), all from a fixed distance of 1.8 m.

Methods

- ❖ Ten female NCAA DII collegiate-level volleyball players participated in the study, age 21.8±1.9 years, height 179.0±5.0 cm; body mass 72.2±7.6 kg; playing experience 10.5±2.8 years.
- ❖ The participants performed three trials of each block jump approach (SB, CWB, SWB) from each direction (right and left), totaling 18 block jumps.

Methods (Cont.)

- ❖ After each jump 30 s rest interval was given with 2 min break between block jump types and directions. The order of the block types and directions was randomized.
- ❖ Data collection of the block approaches were performed using 3D motion capture system and two force plates.
- ❖ Descriptive statistics and repeated measures ANOVAs, with Post Hoc Tukey test and Mauchly's test of sphericity, evaluated variations among block approaches, with significance set at p<0.05 and 95% confidence interval.

Results

- ❖ Significant differences were observed between the three block jump approaches in all measured kinematic and kinetic variables (p<0.01).
- ❖ CWB had the quickest time to takeoff, 1.61±0.03 s, followed by the SWB, 1.64±0.03 s, and the SB, 1.73±0.03 s (p<0.05).

Table 2: Kinematic variables

	Shuffle Block	Chicken Wing Block	Swing Block
Time to Take off (s)	1.73 ± 0.03	1.61 ± 0.03	1.64 ± 0.03
Jump Height (cm)	25.43 ± 0.86	28.21 ± 0.78	28.73 ± 0.68

Notes: mean ± standard deviation

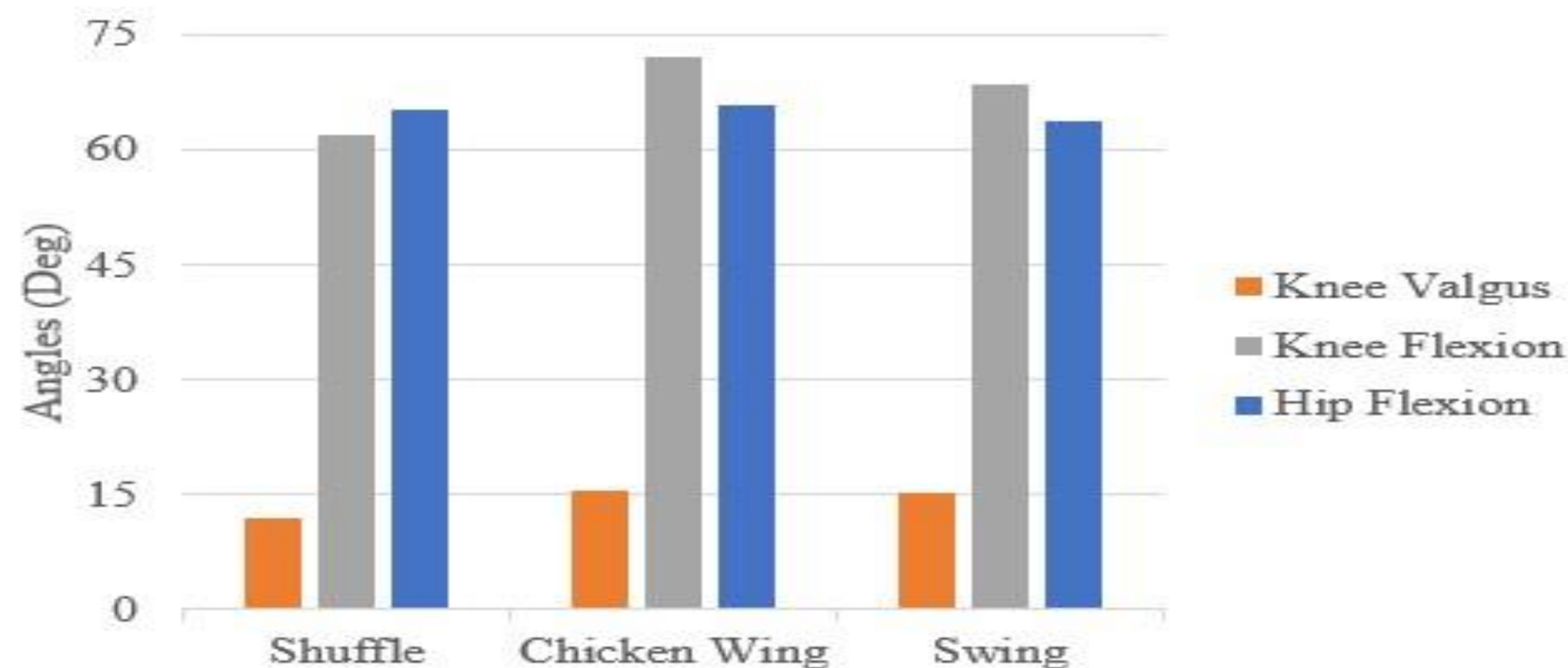


Figure 1: Max Angles

Results (Con.)

- ❖ The jump height for CWB 28.21±0.78 cm and SWB 28.73±0.68 cm outperformed the SB 25.43±0.86 cm (p<0.05). Peak power was significantly higher in CWB 4026.50±164.52 W and SWB 4148.57±154.93 W, than SB 3578.76±124.81 (p<0.05).
- ❖ Same pattern was identified in relative peak power, CWB 54.08±1.55 W/kg and SWB 55.83±1.37 W/kg outperformed SB 48.59±1.14 W/kg (p<0.05). Net impulse in CWB 174.32±4.67 Ns and SWB 175.45±3.94 Ns were significantly higher compared to SB 165.63±5.14 Ns (p < 0.05).
- ❖ Similarly, reactive strength index was higher in both CWB and SWB (0.6±0.02 m/s) compared to SB (0.52±0.02 m/s), p<0.05.

Conclusion

- ❖ Based on the findings and analysis of the three common volleyball jumps, CWB and SWB approaches were faster and were able to achieve much higher jump heights than that of the SB when covering horizontal distance of 1.8 m.

Practical Application

- ❖ As a strength and conditioning coach, programming that enhances the CWB, SWB, and SB approaches would be optimal.
- ❖ CWB and SWB approaches effectively achieve quicker takeoffs and higher jump heights; essential for effective volleyball blocking at a distance of 1.8 m and above. SB is mainly used in a short-distance block. Coaches should personalize their training programs to integrate these movements to refine sports-specific skills..