

# KINEMATIC ANALYSIS OF SPIKING IN ELITE VOLLEYBALL PLAYERS DURING COMPETITION

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**KEY WORDS:** volleyball, spike, height, velocity

**INTRODUCTION:** Spiking is the most complex skill in volleyball game. The height and velocity are major factors influencing the performance of spiking. The purpose of this study was to investigate the characteristics of spike technique of elite male volleyball players during competition for reference in the teaching and coaching volleyball.

**METHODS:** Cuban, Polish, Canadian and Chinese male elite volleyball players who participated in an international competition were subjects in the study. Spiking performed by the subjects were filmed with two SONYDOYVX-100 digital video camera during the game. Fifty successful spikes were selected for analysis. Three-dimensional analysis was performed on the film by computer FYAME DIAS at 60 f. p. s. The data were smoothed by the Fourth-order Butterworth and Low-pass Digital Filter (6HZ) method.

**RESULTS AND DISCUSSION:** The height of hitting the ball was defined as the distance from finger tips of swing arm to the ground. Results showed the average height of hitting the ball in spiking was over 3.00m and the highest was 3.31m in all players. The average height of Polish, Cuban, Canadian and Chinese players were 3.14m, 3.10m and 3.03m, respectively. The average height of front row spike performed by Polish, Chinese, Canadian and Cuban players were 3.13m, 3.07m, 3.07m and 3.01m, respectively. The average height of back row spike performed by Polish, Cuban, Canadian and Chinese players were 3.15m, 3.09m, 3.05m and 3.04m, respectively. The average height in quick spike of Canadian players, Cuban, Polish and Chinese were 3.22m, 3.19m, 3.14m and 3.01m, respectively. The average velocity of spike was over 22m/s and the fastest was 31m/s in all players. Cuban players' was 25.19m/s, Chinese players' was 24.89m/s, Polish players' was 23.24m/s and Canadian players' was 22.8m/s. The velocity of back row spike was faster than that of front spike and quick spike. Thus back row spike would be more powerful. The average velocity of arm swing in spiking was over 16m/s and the fastest was 20.43m/s. The arm swing velocity during spiking of Cuban, Polish, Chinese and Canadian were 18.16m/s, 17.30m/s, 16.56m/s and 16.13m/s, respectively. During spiking, Cuban players swing fastest and the force of spiking performed by them might be stronger than the others.

## REFERENCES:

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