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# The height of the men's winners FIVB Beach Volleyball in relation to specialization and court dimensions

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## ABSTRACT

Tili M, Giatsis G. The height of the men's winners FIVB Beach Volleyball in relation to specialization and court dimensions. *J. Hum. Sport Exerc.* Vol. 6, No. 3, pp. 504-510, 2011. The purpose of this study was to find and compare the heights of the men FIVB Beach Volleyball winners in relation to their specialization and court dimensions (9×9 m or 8×8 m). The heights of men's winners of all FIVB Beach Volleyball (BV) tournaments held between 1987 and 2010 were recorded. The winners were then split into three groups according to their specialization: Defenders (DE), Blockers (BL) without any specialization (No Specialization - NS). Post-hoc Anova test was conducted to determine if there is difference in the winners' height in relation to their specialization and the court dimensions (9×9 and 8×8). Overall, 91 players from 16 countries have won the 257 FIVB BV tournaments. Of the 257 tournaments, 115 were held in 9×9 courts and 142 in 8×8 courts. Of the winners, 44 were defenders, 38 were blockers and 9 had no specialization. The players of all winning teams in 8×8 courts had specialization. The average height of the winners was  $192.7 \pm 5.3$  cm. The shortest winner was 180 cm and the tallest 206 cm. The one way ANOVA indicated that there were significant differences ( $F_{(2,88)} = 34.071$ ,  $p < 0.001$ ) between the defenders, blockers and no specialization players. The Post Hoc Scheffe indicated significant differences between the DE ( $M=189.3$ ,  $SD=3.7$  cm) and BL ( $M=196.7$ ,  $SD=4.6$  cm), as between BL and the NS ( $M=192.2$ ,  $SD=2.5$  cm). Also, significant differences were found ( $F_{(4,99)} = 24.286$ ,  $p < 0.001$ ) between the  $DE_{9 \times 9}$ ,  $DE_{8 \times 8}$ ,  $BL_{9 \times 9}$ ,  $BL_{8 \times 8}$  and NS. The Post Hoc Scheffe indicated significant differences ( $p < 0.001$ ) between the  $DE_{9 \times 9}$  ( $M=188.6$ ,  $SD=4.1$  cm) and  $BL_{9 \times 9}$  ( $M=194.0$ ,  $SD=3.8$  cm), as between  $DE_{9 \times 9}$  and  $BL_{8 \times 8}$  ( $M=198.0$ ,  $SD=4.1$  cm). Furthermore, significant differences were found ( $p < 0.05$ ) between  $BL_{8 \times 8}$  and  $BL_{9 \times 9}$ . No significant differences were found ( $p=0.506$ ) between  $DE_{9 \times 9}$ ,  $DE_{8 \times 8}$ . Significant difference were found between NS ( $M=192.1$ ,  $SD=2.7$  cm) and  $DE_{8 \times 8}$ . The independent t-test found significant difference ( $t_{(18)}=3.215$ ,  $p < 0.01$ ) between the 10 first blockers in victories at 8×8 m ( $M=199.4$ ,  $SD=4.1$ ) and 9×9 m ( $M=193.5$ ,  $SD=4.1$ ). Overall, regarding player specialization, blockers were taller than defenders in both court dimensions. Although blockers in 8×8 courts were taller than those in 9×9 courts, no significant difference was found in defenders. Smaller court dimensions seem to favored taller players in top level world Beach Volleyball because of the larger importance of blocking and the reduced need for agility. The data at hand certifies the new somatometric requirements for blockers in Beach Volleyball. **Key words:** HEIGHT COMPARISON, WINNERS, STATISTICAL ANALYSIS, BEACH VOLLEY

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## INTRODUCTION

FIVB held its first Beach Volleyball tournament in Rio in Brazil in 1987 (Couvillon, 2002). Beach Volleyball was already proliferating in California Beaches since the 50s and since 1983 the AVP has been organizing Beach Volleyball at a professional level (Couvillon, 2003; Homberg & Papageorgiou, 1995).

Beach Volleyball was played in 9×9 m courts until 2000. Since 2001, Beach Volleyball courts are 8x8 meters in size (FIVB, 2001). Nevertheless, in the early years of doubles Beach Volleyball in the 1930s, courts were small (4.6×4.6 m) since players thought they could not cover a larger court. The advantage that Paul Johnson had because of his height, though, led to a decision to play in 9x9 m courts. The decision to play in 9 by 9 m courts soon led to conclusions that shorter players' speed and agility could neutralize taller players. Furthermore, Paul Johnson was the first to introduce doubles Beach Volleyball (Couvillon, 2002).

FIVB made two significant changes in Beach Volleyball after 2000 (FIVB, 2001). Firstly, the scoring system was changed to rally so as to make the game more easy to comprehend and exciting for the spectators (Giatsis & Zetou, 2003) and more suitable for televised broadcasts compared to the large variance in game duration in the side-out scoring system. Secondly, the court size was reduced to make the game more spectacular by increasing the duration of point rallies (Giatsis et al., 2005) because of smaller distances covered and more chances for digs and counter attacks (Giatsis et al., 2003).

Changes in team sports should adhere to the following rules: clear goal definition, respect for basic game regulations, acceptance from players, coaches and spectators (Giatsis & Zetou, 2003). Understanding of the effect the changes will have on multiple variables, data processing by organizers and television ratings and, most importantly, time to assess the impact of the changes to the game (Arias et al., 2011).

Various surveys regarding the impact of changes in court dimensions have been conducted. Giatsis & Papadopoulou (2003) report an increase in play duration due to fewer aces and more counter attacks. Additionally, Giatsis & Tzetzis (2003) found that in the Hellenic Championship the efficiency of attacks and services was reduced and Ronglan & Crydeland (2006) report similar results combined with an increase in the number and efficiency of blocks in FIVB World Tour players.

Furthermore, in another survey that compared the performance from technical aspects between winners and losers for both court dimensions, it is shown that the new rules led to a decrease in the difference of effectiveness in service, reception and defense (dig) and an increase in attack and block (Grgantov et al., 2005). Similar results had been presented in a survey which considered the side out system (Michalopoulou et al., 2005), where the winners outdid the losers mainly in service, reception and attack.

Another survey by Mosquita & Teixeira (2004) states that in FIVB World Tour matches, blockers perform blocks at 86.4% of the cases where as spikes had a maximum frequency of 58%. Similar results are reported by Laios (2008) in the 2004 Olympic Games where blockers actually blocked 90% of the times. However, in another paper by Koch & Tilp (2009) it is evident that women they employ a fake block or drop with a frequency of 26.9% which is much greater compared to men (11.6%).

The surveys discussed above indicate that blocking is very important when the court dimensions are smaller. Therefore, height can be a very significant factor in Beach Volleyball players, especially in blockers. Palao et al. (2008) investigated the heights of 518 players who were at the top of FIVB rankings from 2000 to 2006. In their study the average player height was found to be 193 cm. Additionally, they

found a significant difference between the blocker height (197 cm), defender height (190 cm) and no specialization height (192 cm). Analogous results were presented by Fuchslocher et al. (2004) in 17 World Tour athletes that were among the top 30 in world ranking and had an average height of 191 cm. Other surveys have come up with height averages between 184 and 189 cm, albeit in small numbers of athletes (10-26 athletes) and at a lower level than FIVB World Tour (Bisciotti, 2001; Bishop, 2003; Davies, 2002; Giatsis et al., 2004; Zetou et al., 2007). Furthermore, in a survey on FIVB winners in men, it was found that 61.4% (N=55) of all players have won more than one tournaments and only 16% (N=15) have a number of tournament wins greater than or equal to 10 (Tili et al., 2011).

From the relevant literature review, it is evident that there are no surveys on the heights of male tournament winners at top FIVB Beach Volleyball level and on the differences (if any) on the heights for different court dimensions. The purpose of this survey was to find and compare the heights of all male FIVB Beach Volleyball winners from 1987 to 2010 in relation to their specialization and the court dimensions (9×9 or 8×8).

## MATERIAL AND METHODS

### *Sample*

The survey sample included all 257 FIVB Beach Volleyball Tournaments held between 1987 and 2010. These include the Open tournaments, Grand Slam, World Championship, Goodwill Games and Olympic Games. The winners were then split into three groups according to their specialization: Defenders (DE), Blockers (BL) and without any specialization (NS). Data were retrieved from FIVB websites and the Beach Volleyball Database. Players specialization was determined based on television appearances in the finals and interviews. The observer was a former professional Beach Volleyball player with an international career of more than 10 years who is currently a University Lecturer specializing on Beach Volleyball.

A player was categorized as a defender when he participated less than 20% of the times in a block. When block participation was around 50% (i.e., the player who served played defense), the player was characterized as without any specialization.

Overall, 91 players from 16 countries won the 257 FIVB BV tournaments. Of the 257 tournaments, 115 were held in 9×9 courts and 142 in 8×8 courts. Of the winners, 44 were defenders, 38 were blockers and 9 had no specialization. Four out of nine players without specialization won a tournament as defenders after the court dimensions were changed to 8 by 8 meters. A total of 50 players won tournaments in 8×8 courts whereas 54 athletes won in 9×9 courts. All winning teams in 8×8 courts had specialized players. Only one player won more than one tournament with different specializations.

### **Statistical Analysis**

One way ANOVA and Post-hoc Scheffe tests were performed to find differences (if any) in heights according to winning players specializations and court dimensions (9×9 m and 8×8 m). Statistical significance was set at  $p < 0.05$ .

## RESULTS

The average height of all winners was found to be  $192.7 \pm 5.3$  cm. The shortest winner was 180 cm and the tallest 206 cm. The one way ANOVA indicated that there were significant differences ( $F_{(2,88)} = 34.071$ ,  $p < 0.001$ ) between the defenders, blockers and no specialization players. The Post Hoc Scheffe indicated

significant differences between the DE (M=189.3, SD=3.7 cm) and BL (M=196.7, SD=4.6 cm), as between BL and the NS (M=192.2, SD=2.5 cm).

**Table 1.** Descriptive Statistics of the height in Total Winners, Defenders, Blockers and No specialization players from the 257 tournaments of FIVB.

Specialization	N	Height			
		M	SD	Minimum	Maximum
Defenders	44	189.3	3.7	180	198
Blockers	38	196.7	4.6	188	206
No Specialization	9	192.2	2.5	188	196
Total Winners	91	192.7	5.3	180	206

*Note.* The Post Hoc Scheffe indicated significant differences between the Defenders and Blockers ( $p < 0.01$ ), as between Blockers and the No Specialization.

Also, the one way ANOVA indicated that there were significant differences ( $F_{(4,99)} = 24.286$ ,  $p < 0.001$ ) between the DE<sub>9x9</sub>, DE<sub>8x8</sub>, BL<sub>9x9</sub>, BL<sub>8x8</sub> and NS. The Post Hoc Scheffe indicated significant differences ( $p < .001$ ) between the DE<sub>9x9</sub> (M=188.6, SD=4.1 cm) and BL<sub>9x9</sub> (M=194.0, SD=3.8 cm), as between DE<sub>9x9</sub> and BL<sub>8x8</sub> (M=198.0, SD=4.1 cm). Furthermore, significant differences were found ( $p < 0.05$ ) between BL<sub>8x8</sub> and BL<sub>9x9</sub>. No statistically significant differences ( $p = 0.506$ ) were found between DE<sub>9x9</sub>, DE<sub>8x8</sub> and between NS and DE<sub>9x9</sub> ( $p = 0.247$ ).

**Table 2.** Descriptive Statistics of the height in Defenders, Blockers and No specialization players in the 9x9 m and 8x8 m.

Specialization	Court	N	Height			
			M	SD	Minimum	Maximum
Defenders	9x9	27	188.6	4.4	180	198
Blockers	9x9	19	194.0	3.8	188	201
No Specialization	9x9	8	192.1	2.7	188	196
Defenders	8x8	23	190.5	2.6	185	196
Blockers	8x8	27	198.0	4.1	191	206

*Note.* The Post Hoc Scheffe indicated significant differences between the Defenders<sub>9x9</sub> and Blockers<sub>9x9</sub> ( $p < 0.001$ ), between Defenders<sub>9x9</sub> and Blockers<sub>8x8</sub> ( $p < 0.001$ ), as between Blockers<sub>8x8</sub> and Blockers<sub>9x9</sub> ( $p < 0.05$ ).

The independent t-test found significant difference ( $t_{(18)} = 3.215$ ,  $p < 0.01$ ) between the 10 first blockers in 8x8 m (M=199.4, SD=4.1) and 9x9 m (M=193.5, SD=4.1). Of the top 10 blockers in 9x9 courts, four played with no specialization.

**Table 3.** Means and Standard Deviations of Height from the 10 first blockers of 8x8 m and 9x9 m.

Specialization	Court	N	Height			
			M	SD	Minimum	Maximum
Blockers	9x9	10	199.4	4.1	188	201
Blockers	8x8	10	193.4	4.1	191	206

Note. The independent t-test found significant difference ( $p < 0.01$ ) between the 10 first blockers in 8x8 m and 9x9 m.

## DISCUSSION

As it is evident from the results, the change in court dimensions from 9x9 m to 8x8 m favored taller players who were specialized in blocking at top level FIVB Beach Volleyball. Because of the greater importance of blocking and the smaller need for agility in 8x8 courts, blockers who won the tournaments were taller than those in 9x9 courts and the difference was statistically significant.

It is also worth noting that since 2000 all teams that won tournaments had specialized players. This shows that top players realized that height in a blocker is necessary for success. The results in this survey concur with those reported in the paper from Palao et al. (2008) who considered a large number of players, which goes to show that teams have an overall tendency to include tall blockers. Nevertheless, in the present survey the winning blockers were taller by 0.9 centimeters. On the contrary, until 2000, there was a percentage of winning players (15%) who played without specialization. It must also be mentioned that four out of nine players without specialization in 9x9 courts played as defenders in 8x8 courts and won a tournament. Additionally, two of those players were at the top three in rankings by most wins. Also, the Gold medalists in the 1996 and 2000 Olympics had not any specialization.

No significant difference was found in players specializing in defense, even though defenders in 8x8 courts were found to be 1.9 cm taller. This means that defense skills related to agility and speed (Ahmann, 2005; Hare & Sanderson, 1997; Homberg & Papageorgiou, 1995; Kiraly & Shewman, 1999) were equally important for both court dimensions. A shorter player who can win points by attacking after receiving or digging is adequate for a top level team in 8x8 courts. Such a player is Brazilian Emanuel Rego (190 cm) who has won the most FIVB tournaments out of any player (Tili & Giatsis, 2011).

In their study, Palao et al. (2008) included a number of highly ranked players who played on 8x8 courts without specialization. The average height of those players was found to be equal to that of not specialized players on 9x9 courts. This means that, in theory, players who can block and move around fast can play in both specializations. Nevertheless, there has been no winning team after 2000 without specialized players. Indeed, only one athlete managed to win gold medals playing with different specializations and his regular one was a blocker.

In 9x9 courts, a team needed a blocker who could drop really fast and had the ability to defend. This is easily proven by player rankings with respect to victories. With the new status, in 8x8 courts a blocker will remain on the net nine out of ten times (Mosquita & Teixeira, 2004; Laios, 2008), which clearly outlines the skills required for such a player. The present study found that the height of the top ten winning blockers (about 20% of the total of winners in all court dimensions) in 8x8 courts was 6 centimeters greater than that of blockers in 9x9 courts. More notably, the average height of top blockers in 8x8 courts was 1.4 cm greater than the average height of all blockers.

## CONCLUSIONS

In conclusion, depending on player specialization, blockers were found to be taller than defenders in both court dimensions. Yet, blockers in 8×8 courts were found to be taller than those in 9×9 courts whereas no statistical significant difference was found in defender heights. Smaller court dimensions seem to have favored taller players at top level FIVB Beach Volleyball because of the greater importance of blocking and the smaller need for agility. The data at hand certifies the new somatometric requirements for blockers in Beach Volleyball.

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