

THE EFFECTS OF TECHNICAL AND TACTICAL CRITERIA ON SUCCESS IN 2016 FIVB WOMEN'S VOLLEYBALL WORLD CLUB CHAMPIONSHIP¹

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ABSTRACT

In this study, it was aimed to investigate the technical and tactical criteria affecting the tournament success of the eight teams competed in the 2016 FIVB Women's World Club Championship. Data was collected from the official website of the International Volleyball Federation (FIVB), including the group matches (12 games) in the championship and the final matches (8 games) summing up 20 competitions. The winning points are analyzed in terms of sets, matches and tournament ranking statistics in terms of technical and tactical criteria regarding spike, block, serve, defense, set play and reception. Comparison analysis was done among match success and tournament success rank, technical-tactical criteria. Statistical significance level was taken as 0.05. It was found that there were significant differences in favor of the winning teams in terms of the number of spike points ($t=2,33$, $p=0,025$), the number of block points ($t=3,54$, $p=0,001$), the number of serve points ($t=2,95$, $p=0,005$) the criteria for dig error ($t=-4,35$, $p=0,000$) and reception error ($t=-3,09$, $p=0,004$). It was found that there was a significant difference in favor of the teams in the top ranks according to the criteria of the spike points ($F=3,28$, $p=0,01$) and the points from block ($t=4,27$, $p=0,002$) in terms of success rank. Consequently, the teams in the top rank in the tournament were more successful by the points from spikes and blocks and winning teams made less error of serve, dig and reception. Volleyball players and coaches are thought to be very important to prepare for success by considering these technical and tactical criteria.

Key words: match analysis, spike, block, serve, success

INTRODUCTION

As in other sports, game statistics provide very useful information about match performance in volleyball. Two types of important information are provided about the game, quantitative and qualitative. In order to reach qualitative information, video recordings need to be analyzed on the computer. The movements exhibited by the players in the match, team success, and technical elements are detailed and provide important information to help coaches.² Quantitative statistics are recorded throughout the game and players' performance and all actions can be evaluated instantly. The discovery of technical and tactical elements enables these elements to be developed and training programs organized according to this information.¹ Analyzes are mostly formed as a player, team or opponent in matches, according to criteria consisting of technical movements or tactical elements, and when the match is considered successful and unsuccessful in terms of period, set, halves or match result. There are actions and phases specific to volleyball that repeat during the match. These can be shown as serve, reception, set, spike, block and dig.¹² The fact that each player successfully displays all these criteria in the match as required.⁶

Rabaz et al. (2013) reported that the efficiency of serve, defense, setting and spike was higher in the winning teams in the analyzes made by young volleyball players in their matches. Previous researches, especially the three final movements in volleyball, serve, spike and block are of great importance in success.¹¹ Detailed statistics and analysis of matches in high-level tournaments will give players and coaches important information about the future. In this study, it is aimed to examine the numbers, sets, tournament ranking statistics, spike, block, serve, defense, setting and reception technical and tactical criteria that affect the tournament success of eight teams competing in the 2016 FIVB Women's World Clubs Championship (WWCC).

METHOD

Competition analysis and statistical evaluations were used in the research. In this research, the match statistics of eight teams competing in the 2016 WWCC were evaluated. A total of 20 match datas obtained from the FIVB official website were evaluated, of which 12 were group matches and 8 were qualifying matches. The matches were played in two groups with 4 teams (group A, group B) with single match system. Group A: Eczacibasi Vitra Istanbul (Turkey) Pomi Casalmaggiore (Italy), Rexona Ades (Brazil) and Manila PSL (Philippines). Group B: Vakıfbank Istanbul (Turkey), Bangkok Glass (Thailand), Hisamitsu Springs (Japan) and Volero Zurich (Switzerland). The teams that ranked in the first two in their group qualified for the semi-finals. After the semi-final matches played over a single match using the cross match method, the victorious teams were entitled to play the final. At the end of the tournament, Eczacibasi Vitra Istanbul defeated Pomi Casalmaggiore in the final and became the champion in the 2016 FIVB WWCC. Ranking of the teams, the average age, height, body weight, attack height and block height of the players in the teams are shown in Table I.

Table I. Team success ranking, some physical, game features

Ranking	Teams	Age (year)	Height Length (cm)	Body Weight (kg)	Attack Height (cm)	Block Height (cm)
1	Eczacibasi Vitra Istanbul	27.6	185.53	71.93	295.93	286.73
2	Pomi Casalmaggiore	28.53	183.23	71.07	306.84	282.23
3	Vakifbank Istanbul	25.14	186.42	69.92	300.64	291.42
4	Volero Zürich	28.4	187.86	73.6	305.8	291.66
5	Rexona-Sesc Rio	27.46	180.93	68.73	295.2	278.13
6	Hisamitsu Springs Kobe	25.35	176.1	66.15	294.2	281.9
7	Bangkok Glass	26.6	174.6	63.6	278.35	270.6
8	PSL-F2 Logistics Manila	26.5	179.2	66.05	282.25	273.65

Statistical analysis

The average points won by the teams in the sets according to their success ranking and the average points in the won and lost sets are shown in the graph. Comparison statistics (one-way ANOVA) between team-ranking were applied for scoring points from spike, block and serve. Multiple comparison analyzes (Post-Hoc) were conducted to find the source of the difference between teams. Comparison statistics (independent sample t-test) of technical actions (point from spike, block, serve, dig error and reception error) according to match winning and losing status were made. The significance level was accepted as 0.05 in the evaluations.

RESULTS

Chart 1 shows the average of the number of teams in the sets according to the success order. The average number of the championship team seems lower than the teams in the 2nd and 3rd places. The average number trends of the teams vary especially among the teams that share the first places. In Chart 2, although the number averages of the victorious teams are seen as high compared to the defeated teams, the average number of defeated teams won in the sets (19.8) is quite high.

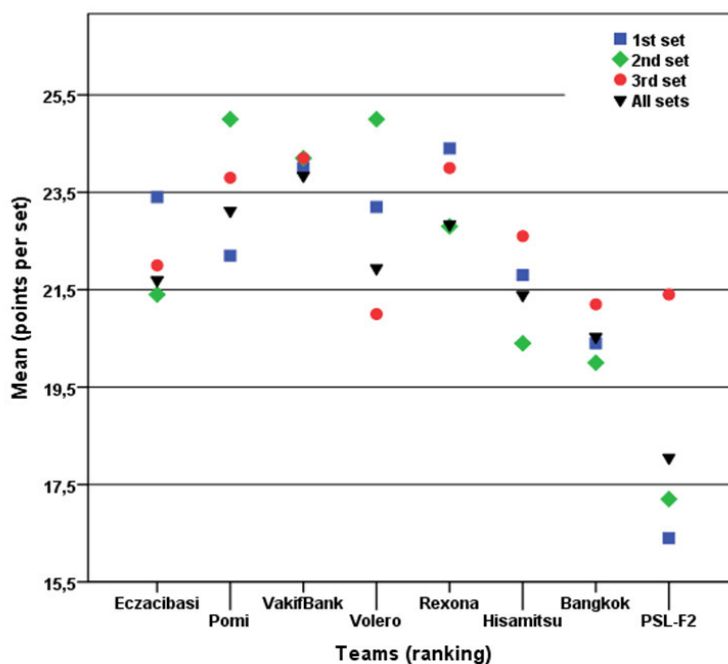


Chart I. Average points of teams in sets in order of success

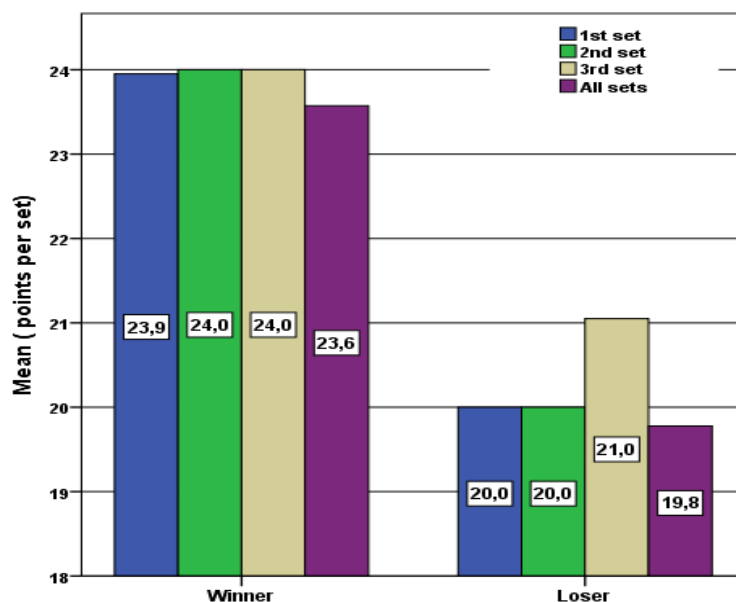


Chart 2. Points distribution of winning and losing teams by sets

According to the success order of the tournament result, a significant difference was found between the average number of spikes ($F = 3.28$; $p = 0.01$) and the block ($F = 4.27$; $p = 0.00$). It was found that the teams higher in the rankings at the end of the tournament won more points than the spike and the block. No significant difference was found between the successful serve percentages of the teams ($p > 0.05$) (Table 2).

Table 2. Comparison of teams according to the ranking of spike and block points and percentage of successful serve variables

Ranking	Teams	Score from spike		Score from block		successful serve %	
		Mean	SD	Mean	SD	Mean	SD
1	Eczacıbaşı	52.40	10.69	12.60	5.46	9.11	4.43
2	Pomi	45.00	12.61	10.60	4.83	6.58	1.22
3	Vakıfbank	55.40	5.32	15.60	8.62	5.79	.85
4	Volero	47.60	6.19	9.00	1.87	6.13	3.06
5	Rexona	51.80	12.83	13.40	5.55	5.67	4.29
6	Hisamitsu	45.80	12.40	5.80	3.11	5.87	1.42
7	Bangkok	35.20	7.36	3.80	1.79	5.61	3.28
8	PSL-F2	34.60	2.70	4.40	2.61	8.11	4.28
	Average	45.98	11.26	9.40	6.00	6.61	3.13
	F	3.28*		4.27**		0.83	
	p	0.01		0.00		0.56	
	Source difference	of* _{1-3-4-5 > 7-8}		** _{1-3-5 > 6-7-8}		null	
				** _{2 > 7-8}			
				** _{3 > 4}			

* $p < 0,05$ and ** $p < 0,01$ level of significance

The average point from the "spike", "block" and "serve" in winner teams was significantly higher than the loser teams ($p < 0.05$). At the same time, winner teams made significantly less dig error and reception error (Table 3).

Table 3. Comparison of technical actions according to teams' win and loss status

Criteria	Match	N	Mean	SD	t	p
Score from spike	Win	20	49.90	8.25	2.33*	0.03
	Lose	20	42.05	12.64		
Score from block	Win	20	12.35	5.84	3.54**	0.00
	Lose	20	6.45	4.63		
Score from serve	Win	20	6.60	2.98	2.95*	0.01
	Lose	20	4.15	2.21		
Dig error	Win	20	25.20	8.04	-4.35**	0.00
	Lose	20	35.50	6.90		
Reception error	Win	20	4.60	2.46	-3.09*	0.01
	Lose	20	7.30	3.05		

* $p < 0.05$ ** $p < 0.01$ level of significance

DISCUSSION

The score averages of the teams that won the match and ranked high in the tournament were higher than the sets. The reason for this is that they perform better technical actions such as spikes and blocks, which is one of the important results of the present study. The decisive criteria are that the victorious teams scored more than spike, block and serve compared to the defeated ones, and the dig errors and reception errors were less. In previous studies, these three criteria emphasize the importance of success in volleyball. The serve shot may not immediately score a number, but it can be advantageous against the opponent in the game process following a good serve. The effective service, which reduces the opponent's attack quality, also

increases the effective block performance of the opponent's attack. effective service also facilitates defense actions.¹² Defensive actions are the most important criterion for determining the team's performance. The quality of dig and reception determines the quality of the set game, and the quality of the setting determines the quality of the spike.⁵ In previous studies based on match analysis, it was revealed that the prominent technical actions of superior teams are effective passing and defense (Miskin et al., 2010) and effective spike.¹¹ Besides, it is emphasized that defensive understanding and actions are important determinants of game success. Marcelino et al. (2011), in their study analyzing men's world cup matches, categorized teams as high, middle and low level. They listed the determining factors in the success of the teams as follows; a) It was the criterion that effective block actions (triple block) significantly affected the success of the match in the matches between the top two-level teams, b) In the lower two-level team's encounter, the points scored by the setter's attack were higher for the winning teams, c) The low number of single or double block actions of the losing teams affected the losing, d) Block strategy (triple block, close to setter), type of service (spike serve) and effective service criteria revealed a difference in the match of a high and a low team.

CONCLUSION

As a result, action data analysis of the matches played in top level volleyball tournaments reveals the game strategies and technical qualities of the players and teams. In this study, it has been revealed that the numbers gained from spike, block and service actions, as well as doing fewer dig errors and reception errors, have a significant effect on the success of the teams. It will be useful for trainers and athletes to evaluate their training setup and match strategies in the light of this information.

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