

## COMPARATIVE STUDY ON EFFICIENCY AND OBTAINING POINTS IN HIGH PERFORMANCE COMPETITIONS OF THE WING SPIKER VOLLEYBALL PLAYER

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**ABSTRACT.** Today sports performance is not a chance. In top performances, a volleyball team must have control over all technical and tactical elements to avoid interrupting a game sequence through mistakes amended by the rules, but by trying to play the game by making the opponent mistaken. The attack is the most influential ability of a volleyball game that can predict the team's success. The offensive action performance is dependent on the height at which it is executed in relation to the height of the net and is determined by the player's ability to have its high vertical center of gravity. In the case of volleyball, the execution of a vertical jump is associated with the athlete's performance, being a decision-making factor in the effectiveness of the attack. The purpose of the study is to evaluate the effectiveness of the world-class players who participated in the Rio 2016 Olympic Games and the World Volleyball League 2017. The measurable values for the study were: player height, vertical jump, reaching the maximum point with a hand-attack with takeoff, jumping and reaching as high as possible with the extended arm, jumping vertically, on the spot, reaching the maximum point with two hands, the number of attacks made in each match, the number of points earned from offensive actions

**Keywords:** *volleyball, outside hitter, strike, hitting efficiency*

**REZUMAT.** *Studiu comparativ privind eficiența jucătorilor extremă din jocul de volei în competițiile de înaltă performanță.* În ziua de azi performanțele sportive nu sunt o întâmplare. În performanțele de vârf, o echipă de volei trebuie să aibă control asupra tuturor elementelor tehnice și tactice, pentru a evita întreruperea unei secvențe de joc, prin greșeli amendate de regulament, dar încercând prin mijloace specifice jocului să îl facă pe adversar să greșească. Atacul este cea mai influentă abilitate specifică jocul de volei cu ajutorul căreia se poate prezice succesul echipei. Performanța acțiunilor ofensive,

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sunt dependente de înălțimea la care se execută în raport cu înălțimea fileului și sunt determinate de capacitatea jucătorului de a-și înălța centrul de greutate pe verticală. În cazul voleiului executarea unei sărituri cu desprindere pe verticală este asociată cu performanța sportivului, fiind un factor decizional în eficiența realizării atacului. Scopul studiului este de a evalua eficiența jucătorilor de clasă mondială care au participat la Jocurile Olimpice de la Rio 2016 și în Liga Mondială de Volei 2017. Valorile măsurabile în vederea realizării studiului au fost: înălțimea jucătorilor, săritura pe verticală, cu elan, și atingerea punctului maxim, cu o mână - elan de atac, săritura și atingerea cât mai sus cu brațul întins, săritură pe verticală, de pe loc, cu atingerea punctului maxim, cu două mâini - elan de brațe, numărul de atacuri realizate în fiecare meci, numărul de puncte câștigate în urma acțiunilor ofensive.

**Cuvinte cheie:** *volei, jucător extremă, eficiența loviturii*

## Introduction

Ball games require extensive skills including technical, tactical and mental skills. Athletes must therefore have the necessary psychological requirements to respond to match requests. Volleyball is one of the most popular ball games in the world and is considered one of the most explosive and fast-running sports. It all started with YMCA Springfield's younger teacher of physical and sports education, Morgan, and will remain in history as the inventor of the volleyball game, at that time being called "Mintonette."

The volleyball game is a game with a high dynamics that requires a combination of aerobic and anaerobic physical characteristics involved in solving defensive or offensive game actions. In the case of volleyball, the execution of a vertical jump is associated with the performance of the athlete, being a decision-making factor in the efficiency of the attack, the blocking of the service, as well as in the defensive actions.

A higher reach point of attack gives the player a better attack angle to make a decisive attack and get the point for his team. A feature of the volleyball game is that each team can have a maximum of three touches, receiving the ball and attack. The volleyball game has a cyclical and sequential structure through which the previous game phase will influence the next one (Reeberg, Luiz Claudio et.al. 2008)

Two types of actions can be distinguished from the three touches, according to (José M. Palao, Manzanares, Valadés, 2014), the solid or terminal actions that attempt to score, actions that challenge the opposing team and continuous actions aiming at neutralizing, eliminating the possibilities of action for the opposing team.

These actions aimed at neutralizing or eliminating the opponents possibilities may consist in sending the opponent a ball that makes it difficult for him to continue the action or in sending a ball to his teammate to increase the chances or facilitates the obtaining of the next point.

The evolution of volleyball world-wide has led players to specialize in positions with different roles. The specialization of positions in volleyball leads to the classification of players in different types. The player considered the first option to be the opposite or spiker, followed by the outside hitter or the second player. Traditionally the opposite or spiker is the player who is the most involved in the attack phases with the highest possibility of completing an attack (make a kill) either from the front row or back row lineup (Rui, José, José Cicero Isabel, 2014). Side players must have very good orientation skills and advanced physical abilities to meet the ball transmitted by the setter to the highest possible point in order to initiate the attack.

The effectiveness of attack, block and service actions depend on the height at which they are executed in relation to the height of the net and are determined by the player's ability to raise vertically his center of gravity - improve his jump height (González-Silva et. al. , 2016) In volleyball the rally is the decisive part of a match. The results accomplished by a team show the effectiveness of the attack, which depends on the characteristics of each team, and the position of the players who have the possibility to attack.

Winning a rally is particular to one player and involves his full participation, using all his physical, technical, tactical and mental capacity as a whole.

## **Sampling**

The selection of the subjects to analyze for comparison was based on their participation in the two events, namely the Rio 2016 Olympic Games and the Volleyball World League 2017. The teams taking part in the Olympics in Rio, twelve in number, were the same teams who got selected for participation in the World Volleyball Championship 2017 .

## **Materials and methods used**

Data for this study was collected in 2016 during the Olympic Games and in 2017 during the World Cup matches at indoor volleyball. The lot being studied represents a small number of players who participated in both events playing either as outside hitters or opposites. The indicators we examined were: the height of the players, the height of the strike, the height of the block,

the effectiveness of the attack, the progress made since the Olympic Games until the World League in the World League (2017). All the attack actions executed by the side players have been recorded as percentage of the success rate in relation to the personal attempts and total attempts of the team.

## Results and discussions

There were a total of 74 matches played in both events, 36 held in the Olympic Games and 36 matches taking place at the World League 2017. The statistical analysis tracked the actions of 8 players from different countries that added up 517 attempts at both events, with 176 attempts at Rio 2016 and 341 at the World League 2017. The players' analysis took into account the number of attempted and completed offensive actions that led to obtaining a point. The percentage of personal successes and successes within the team of the analyzed players showed the following results:

**Table 1.** PERRIN John Gordon (P1)

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
201	353	329	RIO16	18.04	7.06	35.33%	18.81%
			WL17	26	11.02	27.03%	40.33%

Average action per game

**Table 2.** H. Milad (P2)

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
196	350	310	RIO16	19.3	7.3	16.24%	34.22%
			WL17	26.6	12.6	23.27%	45.03%

Average action per game

**Table 3.** H. Milad (P2)

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
196	348	326	RIO16	23.66	11.16	21.32%	49.06%
			WL17	28.05	13.33	23.33%	46.45%

Average action per game

**Table 4. N. Earvin (P4)**

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
194	358	327	RI016	26.04	13.04	30.26%	54.09%
			WL17	35.66	18.66	32.63%	51.04%

Average action per game

**Table 5. S. Taylor (P5)**

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
196	345	320	RI016	22.75	10.05	18.02%	45.66%
			WL17	23.06	13.08	27.58%	57.28%

Average action per game

**Table 6. K. Michal (P6)**

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
191	328	312	RI016	19.25	9.25	18.05%	47.66%
			WL17	22.33	11	22.56%	47.06%

Average action per game

**Table 7. K. Michal (P7)**

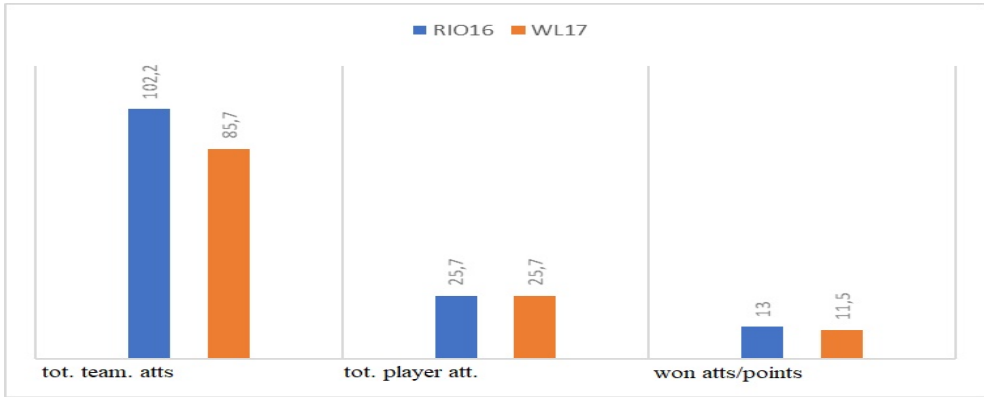
Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
198	344	318	RI016	29	14.4	30.14%	50.62%
			WL17	34.33	16.33	28.31%	47.29%

Average action per game

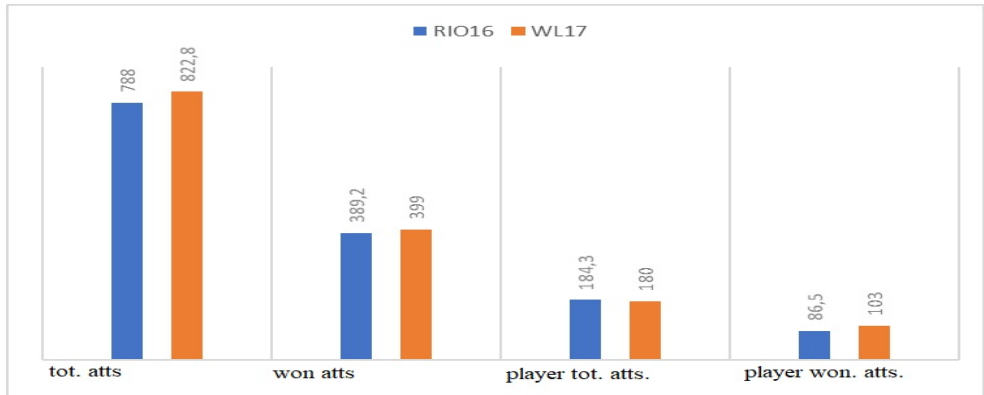
**Table 8. K. Egor (P8)**

Height	Strike height	Block height	Event	Attempts	Won attempts	Percentage of team success rate	Percentage of personal success rate
208	360	350	RI016	25.75	13	24.53%	50.49%
			WL17	25.5	11.5	26.76%	48.27%

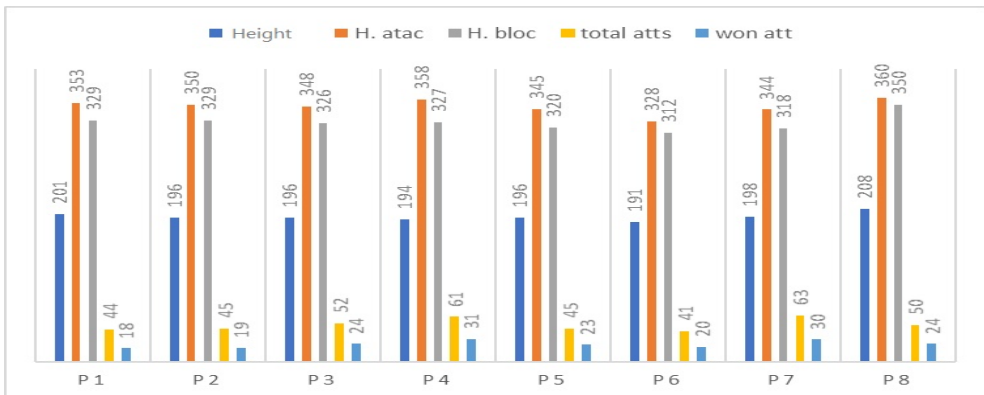
Average action per game



**Fig. 1.** Effectiveness of offensive actions



**Fig. 2.** The average of offensive actions distributed on events



**Fig. 3.** Player results in all events

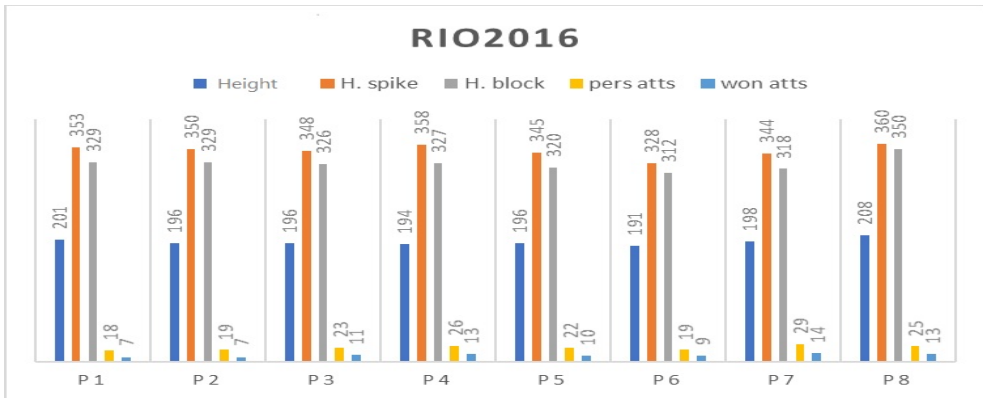


Fig. 4. Player results per event

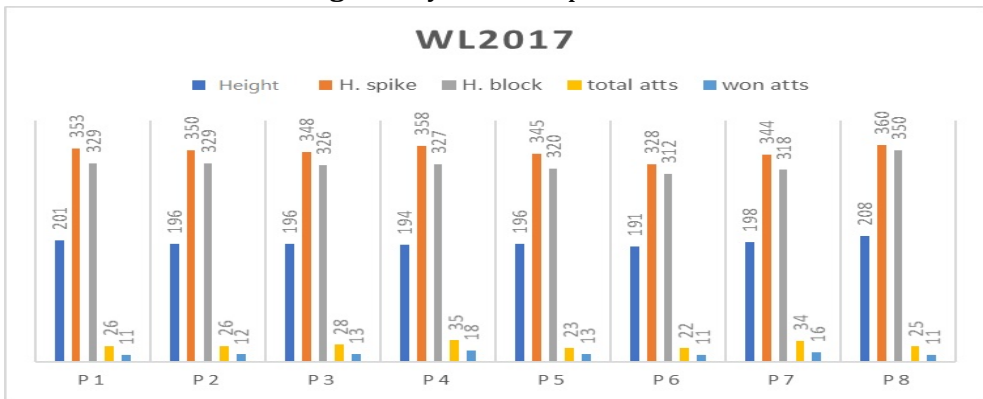


Fig. 5. Player results per event

Figure no. 3 and no. 4 reveal an increase in the number of offensive actions and an increase in successful attack attempts that led to obtaining the point. The number of successful attacks achieved in WL2017 adds up to 148 as compared to 79 accomplished in RIO2016, and the total of attempts at WL2017 are 219 compared to 181 achieved at RIO2016

## Conclusions

Winning a rally is particular to one player and involves his full participation, using all his physical, technical, tactical and mental capacity as a whole. In the modern game, each team has a value leader, a player with remarkable qualities that stands out of the "volleyball specialist on a certain position" pattern, as it is the case with the players we have analyzed, players who have made progress in terms of the number of offensive actions and

taking into account their presence in two of the world's most important volleyball events - the Olympic Games and the Volleyball World League

The high level of involvement of the players included in this study is obvious considering the number of offensive actions they carried out in the two events, but especially in the difference they recorded in the World League 2017 as compared to the 2016 Olympic Games

In the Olympic Games, the average of the passes received by the selected players was 181, out of which 84 were completed, and the number of passes at the World League showed a difference of 69 offensive actions reaching a total of 219 out of which 126 were completed and resulted in getting points, 42 more than at the won attacks accomplished at Rio Olympics according to Chart 4 and 5.

The selected players recorded a difference of 3.12 won attempts in the World League matches as compared to the Olympics, which indicates that wing spikers were involved in more offensive phases, an indicator that marks a number of successes compared to the number of attempts. In WL17, the average of the offensive actions completed by getting a point and service by a player is much closer to the number of attempts than those of the RIO16.

The performance of the attack and block action depended on the height at which it is executed and is related to the height of the net and it is determined by the player's ability to improve his jump height. Thus the average player height is 197.5 cm and it indicates that the selected players have outstanding qualities that contribute to capitalizing the attack action at the net and in the second row, through a high ball hit point 348.25 cm, the average of the attack hits and 324 cm the maximum height of the jam as shown in the figure no.3 A higher jump is essential to be able to perform an attack or strike in optimal conditions.

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