

## STUDY ON DEFENSE EFFICIENCY IN SENIOR VOLLEYBALL TEAMS

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### Abstract

*Objective.* The purpose of this study was to study a performance model in volleyball, at the level of seniors in Romania, in defense actions and especially the relationship between blocking and taking over the attack, so as to achieve an increase in the efficiency of the attack on break point.

*Methods.* All games were recorded and analyzed using Data Volley software (Data Volley 2007). Data was collected and exported from Data Volley 2007 software using program-specific spreadsheets and adapted to game analysis. Each spreadsheet contained the performance of the players and teams during the sets.

*Results.* The study highlights the technical-tactical performance model of the blocking and defense actions, during the game, related to the attack made by the opponent, on several tempos. Depending on the importance of the games, there is also a significant increase in defense, especially in the attack made during time 3, and in terms of performance, there was an increase in the efficiency of defense in the attack made with 2 or three players blocking.

*Conclusions.* This study is the first step in developing a technical-tactical performance model of the relationship between blocking and taking over the attack. The higher the efficiency of the defense in attack, the higher the points of attack after defense.

*Key Words:* efficiency, dig, game, volleyball.

### Introduction

The continuous increase of the mastery of the players and teams, the effect of an efficient selection and preparation, determined changes in the orientation of the competitive game. Therefore, scientific research and coaches are constantly looking for new ways, solutions and methods with a high degree of effectiveness in learning and training athletes.

Actions of taking over and blocking are the most important part of the defense phase, elements that must be practiced diligently in sports training to achieve the desired result: an effective defense (Afonso, J., Mesquita, I. 2011).

In the game of volleyball, the defense team tries to neutralize or repel the opponent's attacking actions through defensive actions such as blocking and defending on the field. Blocking is the first action of a team's defense and aims to intercept, stop or limit the opponent's offensive actions (Selinger, A & Ackerman-Blount, J. 1985).

The main objective of field defense is to control the ball attacked by the opponent to send it to the lifter and thus achieve a constructive effective attack (Stone, J. 2002).

In the game of volleyball, the attack and defense compartments interact, which determines the

performance of the defense, in order to succeed in transforming the defense actions into attack actions. This is possible depending on the age of the players or the level of competition, which are determined by the experience of the players, but also by height, weight, high point of the block (Malina, RM, Bouchard, C. 1991) or the progress made by athletes by participating in workouts.

Blocking performance must take into account anthropometric traits of players (height, weight, wingspan, etc.) and psychological behaviors (reaction time) (Stamm, R., Stamm, M., Thomson, K. 2005). An extremely important thing is that the height of the point reached at the blockage is essential (Grantov, Z., Katic, R., Jankovic, V., 2006), because it allows an adequate technical-tactical execution, at height.

On the other hand, the performance of the defense needs a development of some motor qualities (strength, strength, flexibility, etc.), technical-tactical factors (hand-eye coordination, etc.) and psychological factors (optimal activation for a quick reaction to the attack). adversary) (Stone, J., 2002). Most of these performance factors are limited when the opponent's attack is performed quickly. These quick attacks force the players in defense to react and move as soon as possible. Thus, fast attacks have a higher efficiency (Bergeles, Nikolaidou, 2011) due to

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the conditions in which the blockade and limited defensive movements are performed.

The results can be useful in guiding the training process and increasing the performance of these actions. This study is the first step in developing a technical-tactical performance model of the relationship between blocking and taking over the attack. The higher the efficiency of the defense in attack, the higher the points in attack after defense.

### Methods

The sample consisted of teams and players, who participated in the National Senior Volleyball Championship, 2019-2020. The number of registered games was 30.

Good resolution video cameras positioned on tripods at a height higher than the net were used. For the national senior category, the matches were also downloaded from an official website of the Romanian Volleyball Federation.

All games were recorded and analyzed using Data Volley software (Data Volley 2007). Data was

collected and exported from Data Volley 2007 software using program-specific spreadsheets and adapted to game analysis. Each spreadsheet contained the performance of the players and teams during the sets.

The research methods used were:

- Documentation method;
- Case method;
- Statistical-mathematical method;
- Graphic representation method

The recording and analysis of the block was measured according to the opponent's ability to continue the game when the ball is returned to their field or in terms of the ability of the defending team to continue the game when the ball remains in their field (Table1). The performance of the survey was measured according to the ability of the defending team to continue the game (Table 2).

**Table 1. Blockage evaluation**

Value	Evaluation	Description
0	Wrong	Blocking error. The point is lost after the ball contacts the block
1	Wrong (technical)	Blocking error, by losing the point due to touching the net, ball toys in the opponent's court, etc..
2	Negativ block	The block made in his own field, he cannot build a counterattack, and if the ball goes in the opponent's field, he can build with all the options.
3	Pozitiv block	Blocking made with the ball in his own field and which can establish an attack with all the options, and if the ball remains in the opponent's field, he cannot counterattack.
4	Point	Block with direct point

**Table 2. Evaluation of dig**

Valoare	Evaluare	Descriere
0	Wrong	Mistake in reception attack. The point is lost after the ball comes in contact with the defending player.
1	Reception from attack negative	The ball remains in the home team, but without all the options in attack, and if the ball is in the opponent's court, the opposing team can counterattack..
2	Reception from attack pozitive	Good reception from attack in their own field, and the team has all the options in attack.

An analysis was performed depending on the types of technical-tactical actions specific to the defense. The number of actions, the frequency with which they are repeated, the average of the actions used, the maximum efficiency of each action and the game reports regarding the blocking and defense

actions from the opponents' attacks were calculated. Kruskal-Wallis tests  $p1 < 0.05$  were applied to identify differences between categories and Wilcoxon ( $p < 0.05$ ), analyzing differences between categories.

## Result

**Table 3.** Number of blocks, depending on the type of attack

	Male			Female		
	n	Average	%	n	Average	%
<b>Blocks made</b>	<b>1310</b>	<b>12,57</b>	<b>47,20 ↑ *</b>	<b>1374</b>	<b>11,15</b>	<b>43,30 ↑ * ↓</b>
Tempo 1	320	3.31	23,20 ↑ *	321	2,97	22,85 ↑ *
Tempo 2	600	5,41	46,50 ↑ * ↓ a	773	6.17	55.04 ↑ * ↓ \ a
Tempo 3	390	3,60	27,28 ↑ * ↓ b	280	2.40	19.05 ↑ * ↓ \ ab
<b>Blocks intercepted</b>	<b>1331</b>	<b>12,84</b>	<b>45,09 ↑ * ↓</b>	<b>1487</b>	<b>11,65</b>	<b>45,70 ↑ * ↓</b>
Tempo 1	305	2,62	20,34 ↑ *	222	2,03	16,06 ↑ *
Tempo 2	655	6.19	49,30 ↑ * ↓ a	821	6.94	53,80 ↑ * ↓ \ a
Tempo 3	371	3,85	30,36 ↑ * ↓ ab	434	3,29	27,46 ↑ * ↓ ab
<b>Without blocks</b>	<b>130</b>	<b>1,24</b>	<b>4,43 ↑ * ↓ AB</b>	<b>187</b>	<b>1,58</b>	<b>6,04 ↑ * ↓ \ AB</b>
Total	2771	27,72	100	3148	26,68	100

Significant differences compared to the blockages made. B Significant differences compared to intercepted blockages. a Significant differences compared to the blockage made in the first half. b Significant differences compared to the blockage achieved over time 2.

**Table 4.** Number of reception from attack, depending on the type of attack

	Female			Male		
	n	Average	%	n	Average	%
<b>Reception from attack without touch de ball</b>	<b>459</b>	<b>3,93</b>	<b>32,09 ↑ * ↓ A</b>	<b>479</b>	<b>4,21</b>	<b>38,73 ↑ * ↓ A</b>
<b>Tempo 1</b>	152	1.38	30,74 ↑ * ↓	166	1.28	28,35 ↑ *
<b>Tempo 2</b>	220	1.84	42,25 ↑ * ↓	250	2.40	52,18 ↑ * ↓ \ a
<b>Tempo 3</b>	87	0.71	27,01 ↑ * ↓ ab	63	0.53	11,32 ↑ * ↓ \ ab
<b>Reception from attack with touch de ball</b>	<b>860</b>	<b>8,32</b>	<b>67,91 ↑ * ↓</b>	<b>840</b>	<b>6,85</b>	<b>60,17 ↑ * ↓</b>
<b>Tempo 1</b>	201	1.80	20,31 ↑ *	160	1.36	21,19 ↑ *
<b>Tempo 2</b>	434	4.44	42,57 ↑ * ↓ a	400	3.60	50,43 ↑ * ↓ \ a
<b>Tempo 3</b>	225	2.08	30,11 ↑ * ↓ ab-	280	1.89	28,37 ↑ * ↓ \ ab
<b>Total</b>	1319	12.25	100	1319	11.86	100

Significant differences compared to the takeover. B Significant differences compared to taking the attack with the touch of the ball. a Significant differences compared to the first attack. b Significant differences compared to taking over the attack during 2.

## Discussion

An increase in blockages with the touch of the ball, represents the level of maturity of the players, which advances towards the great performance and can be related to the anthropometric development of the players and their motor skills.

An increase in blockages during times 1 and 2 shows the level of play, which is increasingly proving to be faster in the construction phase.

In terms of blocking and defense performance, there was a significant improvement in performance when cans were made slow attacks. This highlights the ability of defenders to move and correctly perform defense-specific actions.

The defense becomes more and more aggressive and better organized, gaining an increased weight in the balance of the game. Defensive actions represent about 43% of the game's actions, and within them, those specific to the second line with about 14%, tend to balance the specific weight of the block - 16%.

The defenses are organized differently, depending on each tactical attack action, for which special devices and tasks are adopted, primarily in the system with zone 6 withdrawn and only very limited and customized with the elevator in zone 6 intermediate advanced. In general, in the combinatorial game, completed on time I, the players of the first line distribute for the block in the ratio 1: 1, the players from the corresponding zone, and the players of the second line advance, (zone 6 to 6m, and the extremes from zone 1 and zone 5, up to 4m), the combined adversary attack sending the ball mainly to the middle of the field from the net. There is a tendency to jump successively and to organize active and aggressive blocking, even with two players, at this variant of completion. At the attack during time II, or from semi-high lifts, the grouped blockade is organized, of 2 players and doubling of players from the corresponding second line, without preconceived movement under the blockade, favoring the self-doubling action.

In the case of a high lift attack (in case of taking over with a high degree of inaccuracy) and in the case of the second line attack, a block of 3 players is made, with the second line usually arranged in a semicircle and withdrawn on the field boundaries, or with the crowd of half of the field with two players, the other acting with heavy loads to double the block.

In general, the coverage of the surface of the field is done by distributing the surface by color, covering with the specialized players of taking over all the areas from the second line. The defensive placement is favored by the direct action on the ball of the arms of the players in the block (which covers a precise area of the field), from which come the other players who will act overcrowded for the possible directions of the force attack. In defense, players have very low and mobile positions, with the unloading of the weight by lifting and stepping in the direction of taking over when the block jumps. Without fear of the force of the opposing attack, he takes over with two-handed and one-hand damping, as high and very high trajectories as possible. Balls bounced off the block and jumped "overtaken" by defenders are generally recovered by hitting with one hand, clenched fist, jumping or diving with rolling on the back. Balls placed with vaulted trajectories, mostly no longer effective, being easily taken by diving forward, moving with damping on the take-up arm, or with palm contact on the floor, simultaneously with the fall of the ball on the back of the palm, making the so-called "hard lever".

## Conclusions

The distribution of the opposing players in the combination is done individually in the 1:1 relationship, with the player acting in attack on the corresponding area, without "slipping" the players in the block after the opposing attacker, who can change his place in another area along the length of the net.

In setting attacks with semi-high and high trajectories on the net, only a grouping of 2-3 players is organized, directly on the ball, thus allowing a better orientation of the defensive players, who will be able to occupy waiting positions outside the blocking cone.

Blocking and taking over are the most important defensive actions in volleyball, being located before the actions of recovering the balls from the net, doubling and placing.

Blocking efficiency: the statistical situation shows that a significant percentage of balls are considered "reversible" (in play), a situation that could be corrected by an increase in blocking efficiency.

These results show the performance profile of the blockade and the field defense depending on the type of attack in competition. The data provide benchmarks that can be useful in setting training and competition objectives for different categories.

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