THE INFLUENCE OF THE BALL SERVE IN VOLLEYBALL ON THE RESULT OF THE MATCH

A.N. Nalobina, I.L. Ermolaev, K.M. Kazakova, M.V. Tuchin

State Autonomous Educational Institution of Higher Education "Moscow City University", Moscow, Russia

Annotation. In this study, the influence of the ball serve effectiveness indicator on the final result in volleyball matches is identified. The ball serve has a number of differences from other technical elements in volleyball, since the serve is the only element that is performed individually in team sports, and the organization of the opponent's attack and defensive actions of the serving team depend on it. The authors give specific examples of the analysis of seven games in the final of the Championship the Association of Student Sports Clubs of Russia and the cup of the Student Volleyball Association, where the actions of players on the serve led to positive and negative consequences. The definition of such an indicator as "the serve effectiveness" is given, which can be studied using the information and statistical system "Volleyball analyzer". As a result of the study, it was revealed that the Pearson coefficient is equal to 0,6, which indicates an average close correlation between the statistical data on the serve and final results of the match. Thus, when organizing the training process of volleyball players, it is necessary to increase the amount of work on the ball serve, because it serves as one of means of the active offense, with which you can gain a point or disrupt the organization of offensive actions of the opponent, which will allow you to gain an advantage in the score and more likely to achieve a high sports result.

Introduction. Currently, comprehensive scientific support of athletes is an essential part of the training process. Volleyball belongs to the most popular and spectacular type of sports on the planet. Approximately billion people play it around the world. There are players of both the professional and amateur level. In our country, this game is quite widespread [6].

The main composition of the training and competitive activity of volleyball players is implemented through significant components of sports training: physical, technical, tactical, psychological, intellectual, integral and competitive training [7].

In case of any type of planning, the coach should understand the amount of work and its composition in every component of the sports training. Considering technical and tactical training of volleyball players, we would like to point out the role of the ball serve in modern volleyball. This move serves as one of means of the active offense, with the help of which it is possible to gain a point or disrupt the organization of offensive actions of the opponent. It is achieved by precision, diversity and strength of the serve [1]. Each player, who goes for the serve, has a clear plan of putting the ball into play. Thus, the players use a whole width of the serving zone in order to make the game on the serve extremely difficult by changing the angle of the flying ball. The ball is served within last seconds of the time taken to hit the ball on the serve, forcing the opponent players to keep their concentration on the reception for as long as possible [3].

Process of learning and improving the ball serve technique is an integral part of tactical training of athletes, for which approximately 50% of time of the training session is provided. A further process of the in-game situation depends on the player, who performs the serve, which makes this technical element quite significant in modern volleyball. In order to perform the effective serve and achieve high sports results, the player should possess specific personal features, which would help to achieve success. Among these personal qualities, the following can be noted: interference resistance, confidence in your own abilities, ability to take responsibility and show courage when performing a risky serve during an intense moment of the game [5].

Study on the ball serve in volleyball is quite interesting, because it has a number of differences from other technical elements in volleyball. Among these features, putting the ball into play can be noted. It is exactly the ball serve, with which the play begins, and further actions of players on the court, including the organization of the opponent's offensive and defensive actions of the serving team, depend on technique and tactics of performing this element.

It should be also recognized that the ball serve is the only element that is performed individually in team sports. When serving, the player can show the level of their mastery, which would not depend on in-game situation appearing during the ball play. The effective serve is a good mean to gain both in-game and psychological advantage over the opponent, which is why it is worth noticing.

The purpose of this study is to determine the influence of the ball serve effectiveness indicator on the final result in volleyball matches.

Methods and organization. When conducting the study, data from the games of the women's national team of the Moscow City University (MCU) in volleyball for 2020 was used. The analysis of seven games out of eight in the final of the

championship of the Association of Student Sports Clubs (ASSC) of Russia and the cup of the Student Volleyball Association (SVA) was conducted (Table 1-4).

When organizing the study, methods of analysis of informational references on the study's topic, method of video footage analysis, as well as mathematical statistics methods were used. Detailed statistics of each game were computed using the information and statistical system "Volleyball analyzer", which allows conducting the analysis of in-game actions. With this software, the following can be registered: way, quality, effectiveness and direction of the serve and pass; played combinations; direction, effectiveness of the attack and its result; quality of setting the block; actions of players in defense; effectiveness of the team's lineup [7].

Table 1

The all-russian final of the ASSC Championship (Kazan, 2020)

Group D		1	2	3	G	W	L	P
1	PFUR		2:0	2:0	2	2	4-0	6
2	MCU	0:2		2:0	2	1	2-2	3
3	MSMU	0:2	0:2		2	0	0-2	0

Note: G – number of games for a team; W – number of matches won; L – number of losses; P – points (for the game's result: 2:0 – 3 points, 2:1 – 2 points, 1:2 – 1 point, 0:2 – 0 points)

Table 2

Tournament table of the group stage of the all-russian final of the ASSC Championship (top division, girls, Kazan, 2020)

¼ of the final	1	G	W	L	P
SFU	2:0	1	1	2:0	3
MCU	0:2	1	0	0:2	0

Note: G – number of games for a team; W – number of matches won; L – number of losses; P – points (for the game's result: 2:0 – 3 points, 2:1 – 2 points, 1:2 – 1 point, 0:2 – 0 points)

Table 3

Tournament table of ¼ of the all-russian final of the ASSC Championship (top division, girls, Kazan, 2020)

Group C		1	2	3	4	G	W	L	P
1	PFUR		2:0	1:2	2:0	3	2	5-2	7
2	BSU	0:2		2:0	2:0	3	2	4-2	6
3	DSU	2:1	0:2		1:2	3	1	3-5	3
4	MCU	0:2	0:2	2:1		3	1	2-5	2

Note: G – number of games for a team; W – number of matches won; L – number of losses; P – points (for the game's result: 2:0 – 3 points, 2:1 – 2 points, 1:2 – 1 point, 0:2 – 0 points)

Table 4

Tournament table of the group stage of the SVA cup (Moscow, 2020)

For the 9-11 place		1	2	3	G	W	L	P
1	MCU		2:1	2:1	2	2	4-2	4
2	PRUE	1:2		2:0	2	1	3-2	4
3	MPEI	1:2	0:2		2	0	1-4	1

Note: G – number of games for a team; W – number of matches won; L – number of losses; P – points (for the game's result: 2:0 – 3 points, 2:1 – 2 points, 1:2 – 1 point, 0:2 – 0 points)

Calculations were made in Excel from Microsoft Office. Firstly, using the "CORREL" function, the correlation coefficient between ranges of cells was calculated, then, in order to get statistically significant values, coefficient of the r-correlation for small samples was calculated. The following formula was used: $(r*(n-1))/n$, where "n" is an amount of pairs of matched variables. The serve's effectiveness was calculated using the following formula: (amount of gained points for the serve + amount of hindered moves of the opponent)/total amount of serves.

Results and discussion. Non-participant observation, analysis of game footage and results of the statistical processing allowed revealing a number of in-game situations, in which result of the game or the whole match depended on actions of the serve. For example, during the game with the Dagestan State University (DSU), after three failures in a row made by the MCU, the performance of defensive actions of the national team was decreased, which could be related to psychological instability of girls. As a rule, if the player makes a mistake on the serve once, then accident, hastiness or hesitation could be the reason for that. However, if several players make a mistake, then the psychological problem in team's mindset could be the reason. Players from Dagestan, in their turn, performed complicated serves confidently, which did not allow players from the MCU to organize their own offense. After this episode, the score was changed from 3:4 to 3:8 for the DSU. During the set, national team of the MCU could not close the gap, and the DSU team won in this set.

During the game with the Bashkir State University (BSU), a situation was revealed, in which teams were taking the lead in turns due to actions on the serve. In the first set, one of the MCU players performed a series of serves, which consisted of one ace and two hindered moves of the opponent. By making a small gap at the beginning of the set, players began to feel more confident, which reflected on statistics for this period of time spent on the court. Then, the BSU team managed to break through by 7 points, three of which were gained with aces. Due to an unsuccessful move, the MCU team could not win another point on the serve and lost their advantage in the score, which was changed from 13:12 to 14:20 for the BSU. The fourteenth point was gained by the MCU team due to the mistake made by the opponent on the serve, after which the team closed the gap thanks to effective actions of their serving player. Within this period, two points out of four were gained with aces, two other points – with successful actions in the game, which were made after the hindered move of the opponent. Despite this fact, the MCU team could not win in this set due to the great gap in the score, which was supported by an effective serves made by the BSU team in the middle of the set.

The next example shows that it is possible to turn the unfortunate game around thanks to the confident play and the not only stable, but also effective ball serve.

During the second set in the game with the Plekhanov Russian University of Economics (PRUE), the MCU team, losing with 0:1, goes for the serve after the mistake made by serving players of the PRUE team. A series of three serves made by the MCU, two of which led to mistakes made by the opponent, forced the PRUE team to make mistakes both on serves and other in-game moments. It led to the 4-point gap, which preserved up to the end of the set and allowed the MCU team to achieve victory.

A similar situation happened during the end match against the Moscow Power Engineering Institute (MPEI). Thanks to the risky and complicated serve, the MCU team managed to make a significant gap. The game was started with the score of 4:0. The MCU team chose an appropriate serve tactic for this situation, which included the targeted serve to players, who were less proficient at receiving the ball in comparison with other members of the opponent's team. As a result, this tactic proved its value. Such serve frequently led to aces and passing balls, which were successfully managed by players of the frontcourt. From the very beginning, the MCU team took the initiative and forced their opponent to make mistakes, which led to unconfident play of the MPEI team and their loss according to the match's results.

As practice shows, the ball serve becomes a dangerous weapon in hands of the technically and tactically prepared player. A successful serve at the match's beginning, not just putting the ball into play, allows forming a certain point supply, which gives the team confidence in their own abilities due to the fact that they have a right to make a mistake, they also take more risks in in-game situations. In this case, the opponent becomes more instable when performing technical elements, psychological tension grows due to the fact that every point counts and each mistake can become critical by increasing the gap in the final score. The serve's effectiveness also plays a special role in situations, when there is a need to keep up with the opponent or to win the set's end in case of even score. In this case, ace gives a possibility to gain strong emotional advantage over the opponent, to apply tangible pressure and get closer to victory.

After the analysis of the scientific literature on the study's topic and certain in-game situations, identification of the level of close correlation between statistical data on serves and final results in volleyball matches.

The table 5 presented statistical data on the serve in every set, as well as the final score in each game. In columns "G1", "G2" and "G3", the score in games is shown. Score of the MCU team is presented first, then – the opponent's score. Information in "T" (total) columns shows a total number of performed serves, among which "M" – mistakes and "P" points are presented. Based on these data, the effectiveness is calculated, which is shown in the "E" column in %.

Table 5

Summary values for the score and the serve's effectiveness in each game

Match	G1	T	M	P	E	G2	T	M	P	E	G3	T	M	P	E
MCU PRUE	19:25	19	2	0	26%	25:19	25	1	5	44%	15:12	14	4	1	28%
MCU BSU	25:27	17	0	2	29%	24:26	21	2	2	38%					
MCU MPEI	25:13	25	3	2	24%	12:25	12	2	1	33%	15:11	15	2	3	60%
MCU PFUR	11:25	11	3	1	27%	21:25	22	2	2	31%					
MCU DSU	24:26	24	3	1	58%	25:15	25	2	2	32%	15:11	14	1	0	35%
MCU PFUR	17:25	17	0	2	29%	20:25	21	2	2	38%					
MCU SFU	25:22	25	2	2	36%	10:25	24	0	2	25%					

This table reveals that the highest effectiveness is typical for winning games, and games, which outcome was decided at the very end of the set. For example, the first game of the MCU-DSU match (24:26) had 58% of the effectiveness, the second game of the MCU- PRUE match (25:19) – 44% of the effectiveness and the third game of the MCU-MPEI match (15:11) – 60%. Meanwhile, low effectiveness on the serve is shown in games, in which the MCU team conceded by a large scoring margin. For example, the first game of the MCU-PFUR match (11:25) had 27% of the effectiveness, the second game of the MCU-SFU match (10:25) – 25%. This pattern confirms the great importance of the successful and complex serve to the final result of the game. If the player performs the stable and difficult for reception serve, there are more chances to create a situation, in which the opponent will lose balance and either will not able to receive the ball, and that would be considered as the ace, or they will be forced to pass the ball to the side of the serving team without taking any risks. Such balls are called "free balls", and they are not difficult for the defenders of the serving team. In its turn, it allows the setter of the serving team to organize fast counterattack and gain a point for their team.

When processing final results of the game, 1 point was given for losing the game with 0:2, 2 points – for losing with 1:2, 3 points – for winning with 2:1 and 4 points – for winning with 2:0. All data needed for calculation of the close correlation between statistical data on the serve and final results in volleyball matches are presented in the quantitative scale and have normal distribution, which allowed using the Pearson's r-criterion in our study. This method of parametric statistics allows identifying presence or absence of the linear connection between two quantitative indicators, as well as evaluating its close connection [4]. In the Table 6

information on summary values of the serve's effectiveness and final results of played matches is presented.

Table 6

Summary values of the serve's effectiveness and final results of played matches

Match	Effectiveness, %	Points earned
MCU- PRUE	34	3
MCU - BSU	34	1
MCU - MPEI	36	3
MCU - PFUR	30	1
MCU - DSU	42	3
MCU - PFUR	34	1
MCU - SFU	30	1

As a result of using the correlation analysis of indicators of the effectiveness of the ball serve and results of matches, the correlation coefficient r=0,6 was obtained, which indicated an average level of close correlation and presence of linear connection between statistical data on serves and final results of played match.

Conclusion. The study revealed that the effectiveness of the ball serve in volleyball has a significant effect on the match's results. The average level of close correlation between these variables can be explained by the presence of other factors, the impact of which also influences on the final result. Firstly, it is the level of sports and psychological fitness of volleyball players, as well as external factors, which can influence the athlete during the training process and implementation of competitive activity.

The players also note, that the physical state, the score, the coach's instructions, the risk level, the adrenaline level, lighting in the court and even new balls influence their serve performance. Each player, who performs the serve, has a clear plan of putting the ball into play. However, despite the high level of fitness, performance of this technical element causes difficulties quite frequently due to the fact that the volleyball player fights not only the opponent, but also themselves. That is why the psychological factor is considered as the key factor by many [2]. Taking the aforementioned into account, it is safe to conclude that in case of organizing the training process during technical and tactical training of volleyball players, it is necessary to increase the amount of work on the serve, with which you can win a point or disrupt the organization of the offensive actions of the opponent, which will allow you to gain an advantage in the score and more likely to achieve a high sports result.

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Information about the authors: Anna Nikolaevna Nalobina – Doctor of Biological Sciences, Professor of Department of Adaptology and Sports Training in the Moscow City University, Moscow, e-mail: NalobinaAN@mgpu.ru; **Ivan Leonidovich Ermolaev** – Graduate student of Department of Adaptology and Sports Training in the Moscow City University, Moscow, e-mail: ErmolaevIL@mgpu.ru; **Ksenia Mikhailovna Kazakova** – student of Department of Adaptology and Sports Training in the Moscow City University, Moscow, e-mail: KazakovaKM@mgpu.ru; **Mikhail Vital'evich Tuchin** – Student of Department of Adaptology and Sports Training in the Moscow City University, Moscow, e-mail: TuchinMV@student.bmstu.ru