

The (Block) Type — Quality as a Technical Element that Distinguished in Women's Volleyball

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Abstract: The purpose of this work was to compare technical and tactical elements (Block type, Block quality) of teams that participated in the 2022–2023 women's volleyball league A1 category (play off). The sample consisted of the matches (8 matches) played by the teams ranked in the first 4 places. The elements evaluated were the type of block and the quality of the block in complex 2. The recording of the above technical elements became a means of observing and recording each event (2,817 racing episodes) in a protocol that was structured with a separate scale (five/grade) for each variable. The statistical analysis performed was the χ^2 (chi-square) mean of the SPSS program. After processing the data it appeared that there was a significant difference of the single block type and the triple block type as well as the quality of the single block. These results can be used as coaching guidelines to create drills in high block defense training.

Key words: volleyball, observation, block, data analysis, complex 2

1. Introduction

Volleyball is a team sport that requires special intellectual, mental and technical skills. Playing volleyball both recreationally and competitively requires relevant knowledge and experience, in order for athletes to cope satisfactorily with the current needs of each match.

In volleyball there are 7 characteristic phases that are repeated and are the basic organizational actions that define the game. These phases are: the serve, the reception of the serve, the pass, the attack, the block, the territorial defense and the counter-attack. Of these phases, the first 3, i.e., receiving the serve, passing and attacking, constitute complex 1, while serving, blocking, territorial defense, passing and counter-attacking constitute complex 2.

According to Arie Selinger, coach of the US Women's National Team from 1975–1984, volleyball is a game of anticipation, a game played in emergency situations. It emphasizes the use of skills in the execution of the movement and by perfecting the basic techniques the player is constantly evolving. Basic volleyball skills are constantly practiced and repeated at every level of play (1985).

It is well known that match videos have an advantage over notes because they can be replayed. Thus, researchers are given the possibility to analyze the matches segmentally and even with different criteria each time. Video analysis is a very widespread method of analysis and evaluation of actions and movements used for indirect

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observation of games, teams or individual athletes based on video and computer.

The evaluation of personal and team performance through statistical analyzes of the game, is a factor that has helped significantly in the development of sports and especially volleyball.

It is widely accepted that the more information a team has about the way they play, the easier it is to deal with them. Information can be gathered in many ways, e.g., from video recording of her other matches, from descriptions of other interested parties or even from the special press. This information acquires more value if it is supplemented by the observations of the coach who is interested in this team. There are many ways to analyze a team's game, depending on the objects of observation.

The cheapest, shortest and most relaxing method for team players to neutralize the stud is the block. The block is the team's first line of defense. It is the action taken by the players in the offensive zone that aims to stop the opponent's offensive action before the ball passes into their own court. It is the only action that is allowed under the rules of volleyball for a player to cross his hands into the opponent's court and touch the ball.

According to the results of the study by Palomino E. M., Royón F. A., Richards J., Benítez J. M. and Espa A. U. (2021), support the idea of teaching the bilateral approach before learning the attack to improve coordination and avoid asymmetries between limbs.

In another study by Garcia S., Delattre N., Berton E., Divrechy G. and Rao G. (2022) results showed that volleyball players' experience gained during regular training and matches can play an important role in kinematics and landing kinetics to reduce the risk of injury.

Also the study of Numata K., Motoshima Y., Hamada K., Sakanaka M., Murakami S., Kashiwagi R. and Takahashi H. (2021), showed that the performance of jump height, maximum block distance and movement time was better on the left side, with a large effect size.

2. Literature Review

2.1 Historical Review of Volleyball

Volleyball is an Olympic team sport, which was invented in 1895 in Massachusetts, USA. by William Morgan, who worked at the YMCA in Massachusetts, USA. Trying to create an indoor team game, without the risk of injury, he invented volleyball. It was originally called "Mayonet" (a game of French nobles). Then Dr. Halsting called it "volleyball". The new sport spread very quickly, mainly through the branches of H.A.N. in the US states and around the world. It was brought to Europe during the 1st World War by the American soldiers. In Greece, the first volleyball teams appeared at the end of the 1910–20s in Thessaloniki from X.A.N.Th. and in Smyrna from Panionios. For many years the sport belonged to SEGAS, which organized the relevant championships. In 1970 the Hellenic Volleyball Federation or EOPE was founded. The great development of Volleyball began in the 1950–1960s during that period the sport achieved high numbers of spectacle and was watched by thousands of fans Worldwide there were three volleyball schools in that decade. The schools were from the Czech Republic, the Soviet Union and Japan. He came to Greece in 1922 and was taught by Athanasios Lefkaditis. Since 2000, new regulations have been in effect, which the international federation has established with the aim of making the sport more spectacular, the time of possession of the ball in the service became 8", it is allowed to block the ball with the foot or any other part of the body , the coach may stand in a certain area between the bench and the court, on the serve the ball is allowed to touch the net.

Initially it was played with various balls. In 1900, the first special volleyball was manufactured. In 1947, the

International Volleyball Federation (Fédération Internationale de Volleyball or FIVB) was founded in Paris, which formulated uniform international regulations. It was the first international federation of the sport of volleyball and was founded by 14 countries: Italy, Netherlands, Belgium, Yugoslavia, Romania, Hungary, Portugal, USA, Brazil, Uruguay and Egypt (Grozdanovic, Marinovic, & Grozdanovic, 2005). Volleyball, as it is a sport that is played with little indoors and outdoors in the open air and in a gym, is definitely a sport of the future. In addition to its recreational role, the sport helps to improve the physical condition of the participants (Grozdanovic, Marinovic, & Grozdanovic, 2005). In 1963, the European Volleyball Confederation (Confédération Européenne de Volleyball or CEV) was founded. 1964 was an important year for volleyball, as it was included in the program of the Tokyo Olympics, for both men and women.

In the 1990s–2000s we strongly see the effort of the International Federation to make the sport of Volleyball more spectacular and televised. For these purposes the counting system where each phase corresponds to one point in the 5th set “TIE-BREAK” was used and later from 1999 it was applied to the whole game. So the sets that used to end at 15 points, now end at 25 except for the 5th set that ends at 15 points. With this change, the difference in capacity between the teams was reduced, resulting in greater competition. These efforts were further boosted by the introduction of the “libero” player with the change in regulation regarding ball handling in defense. In addition, the ball is allowed to touch the net during the service.

Finally, the words of William Morgan who said that by the end of the 20th century, Volleyball will be played in every corner of the Earth by a large number of young people, can be considered prophetic.

2.2 Volleyball Complexes

A complete competitive episode includes two bundles of elements that are also called syndromes (complex), (Fielder, 1975; Mpergeles, 1998). Separating these bonds begins with serving, the sequential actions that occur in the phase and manner of contact with the ball. This is how the separation of the two chain links occurs and we distinguish complex 1 and complex 2. Complex 1 consists of reception, how much attack, while complex 2 consists of service, block, defense, pass and counter attack. The syndromes, even though they are divided into 1 and 2, are directly related to each other, as the team that has service with complex 2 respectively the opposing team will continue the phase with the rest of the actions such as the reception which belongs to complex 1. The complex 1 compared to complex 2 is superior since the result of the opponent's first reception action immediately after the service will determine the development of the game since the flow of the phase's actions will be affected. Complex 2 efficiency drops noticeably by about 25% between the 1996 Olympics and the 1998 World Championships for men. There is still a reduction in the duration of syndromes to win a team in complex 2 a point will have to perform 3.6 serves in the 1996 Olympic games, in contrast to the 1998 world championships which needed 2.9 serves (Bergeles, 1999). Another new addition to the regulations was the participation of liberos which was tested in 1998 at the “Grand Prix” and the World Championships for men and women in 1998. But the new regulations did not have the desired effect as they completely weakened the complex 2.

In the past where a volleyball match took much longer since scoring was done differently, it resulted in complexes appearing more frequently, confirming the superiority of the complex 1. The increased duration of the match led the International Federation (FIVB) to changes in the regulations instituting the continuous counting of points, resulting in a reduction of both the duration of the match and the more frequent presence of the two complexes. This regulation change was made with the aim of strengthening complex 2. Prolonged contact with the ball with any part of the players' body also began to be allowed (Bergeles, 1999).

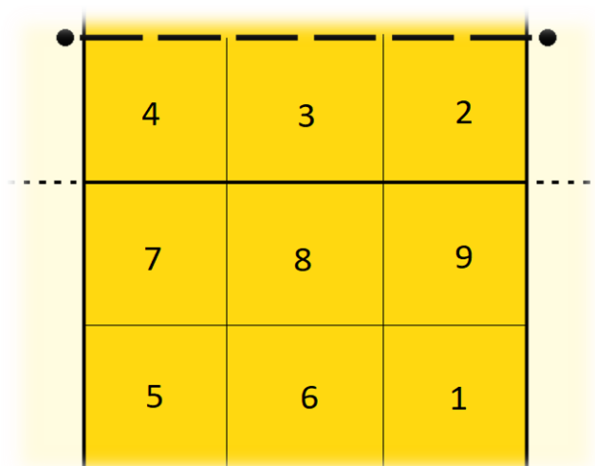


Figure 1 The Zones of the Field

2.3 The Block in Complex 2

Every action in volleyball has its purpose, so the block has two purposes. These purposes are:

- 1) The rebounded ball must fall directly into the opponent's court and the phase of the game ends. This action in the language of the volleyball player is called "finished block".
- 2) The ball after hitting the hands of the block players will pass at a reduced speed, so that the players can counter-attack in turn. This action in the language of volleyball is called breaking the block.

There are two types of blocks which are the Active block and the Passive block:

- 1) The active block is called the effort in which the blocker can reach higher than the attacker with the result that, after covering the ball with his hands, a finished block occurs with a vertical trajectory towards the opponent's court.
- 2) The passive block is called so, when the blocker's attempt to slightly touch the ball hit from higher by an offensive player, with the aim of reducing its speed during its passage in his own court, to give the team a chance of organizing a counterattack.

Blocks depending on the placement of the player's hands are distinguished into:

- 1) Closed block, when the palms are facing inwards.
- 2) Semi-closed block, when the outer palm turns inwards.
- 3) Open block, when the player leaves the opponent with an intentional gap, which is defended by the ground defender.
- 4) Pretended block, when the player pretends to jump for a block and stays on the ground to receive the puck.
- 5) "Hands down", when the player reads the attacker's intention to place and does not jump block.
- 6) Blocks out and lowers his hands before he hits the ball.
- 7) Hand shift block, when the blocker shifts his hands side-left or side-right to stop the attacker.

After the 1976 Olympics, the block regulations changed. Since then, teams have been allowed to make contact with the ball three times in addition to after the block contact. Therefore, the ball may come into contact with the blocker's hands and the team may have three more touches to execute the counter attack. Also, the front line player may make 2 consecutive touches of the ball as long as the first touch was part of the block. These

changes were positive for the game, and for the development of the sport. creating longer phases.

2.4 Video-Analysis

Nowadays, the recording of competitive situations and incidents using computers and corresponding software has become so imperative that it is an essential tool at the disposal of high-level team coaches (Zetou, Tsigilis, Moustakidis, & Komninakidou, 2006). Video is considered to be a useful tool, used by coaches in order to have the possibility to produce, to modify the technique or tactics of their players during the match (Zadružnik, Marelić, & Rešetar, 2009).

The European Volleyball Confederation (CEV) provides a specific software, “Data Volley 2 Professional” by the company “Data Project” for the recording of match data. The software captures all the technical elements involved in a volleyball game and breaks it down into factors. In particular “Data Volley” has a wide share since it is accessible from any device. One can watch the video stream and the replay of the last 5 points. It is saved and one can watch the most important points later. One can share useful game strategy information with coaches, statistics with reporter and TV. It is necessary during training, since the data collected can be used to study the effectiveness of athletes and their evolution over time, in order to prepare exercises aimed at improving performance.

The enablement of computer technology has enabled a more detailed evaluation of sports behaviors and has given rise to the creation of many video-analysis programs. These programs are based on the use of computers and were designed to record the technical-tactical data of football players in order to draw conclusions about the performance of the team as a whole, but also of the players individually. The video analysis helps both the footballers in their work and the coach. Technology in the form of video has made watching the opposing team 'spy' cheaper and easier, but there is also the danger that many coaches spend endless time watching their opponents and their weaknesses rather than teaching their players, or they take the time to come up with a workout plan. It must be emphasized that it is a complementary tool and in no case replaces the coach and training.

3. Methods

3.1 Sample

The sample of this research consisted of 4 teams that participated in the 2022–2023 (play off) A1 women's volleyball championship. 8 matches of the final phase were recorded and observed. In particular, phases were recorded and observed based on Complex 2, which involved serving, blocking, defense and counterattack.

3.2 Experimental Design

For data collection, the method of indirect observation was used with the help of the following devices:

- Camera for filming the matches
- Electronic computer
- The Microsoft Excel program for transferring the data to the S.P.S.S program. where their further statistical processing was done.

The match recording camera was placed at the back of the court at a high point 15 m away from the end line of the Volleyball court.

3.3 Statistical Analysis

For the statistical analysis of the data to check the frequency of occurrence of the values of the specific elements (qualitative variables), with the occurrence of values of another element (qualitative variable), the χ^2 (Crosstabs - Chi Square test) analysis was used.

3.4 Results

According to the present research, the double block prevails in relation to the single block, and indeed by a large margin. However in block quality the highest percentages are in the losing block with a significant difference between winners and losers. Losing teams have slightly more missed blocks which certainly played a role in the outcome.

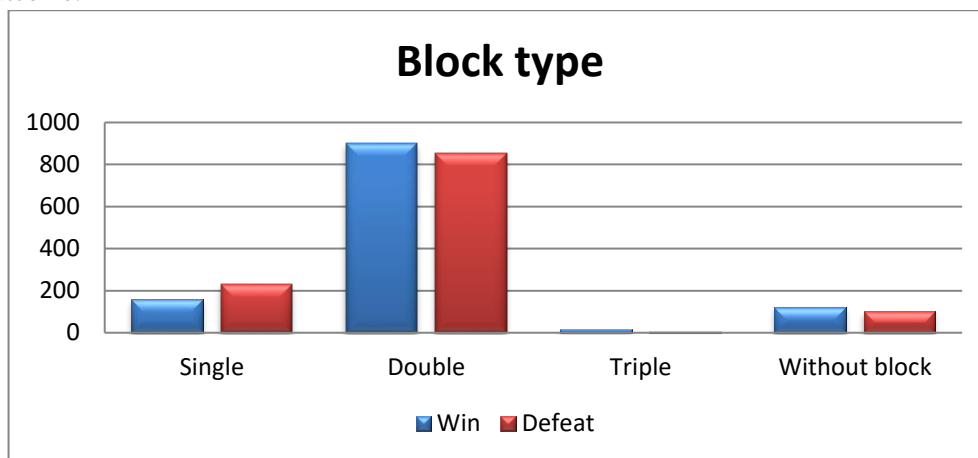


Figure 1 Block Type/Winner-Defeated.

Block type	χ^2 - intex P
Single block	$\chi^2 = 16.9$, $p = 0.000$
Triple block	$\chi^2 = 7.12$, $p = 0.008$

Panel 1 Block Type/Winner-Defeated

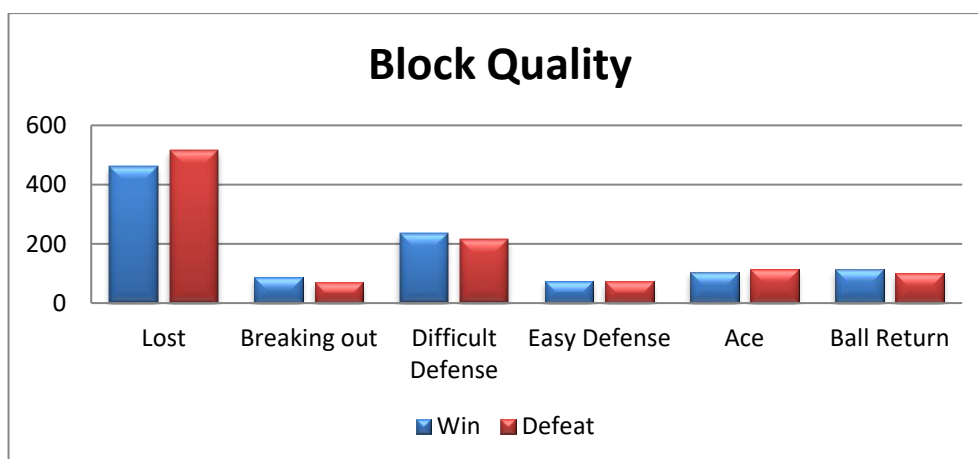


Figure 2 Block Quality/Winner-Defeated

Block quality	χ^2 - intex P
Lost	$\chi^2 = 6.57$, $p = 0.01$

Panel 2 Block Quality/Winner-Defeated

4. Discussion – Conclusions

Through the results we see that double block is used more often than single and triple block. This is because with the double block it is usually a break and an easy defense. However in the quality of the block we notice that most were lost. So coaches should focus more on training the double block or they could use the triple block which may have had more success. At higher levels of competition, you see an increase in fouls, direct points and contacts that limit the opponent's counterattack (Echeverría C., Ortega E. & Palao J. M., 2020). However research that aimed to develop a new and accurate measurement system of block reaction time for volleyball players, showed that the measured BRTs were smaller than those measured using light stimuli in previous studies, likely because the participants in this study were able to predict the direction of the ball throw using cues collected from the preliminary movements of the set (Yamada Y., 2023).

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