STUDY ON THE QUALITY OF SERVICE IN ROMANIAN 1ST DIVISION WOMEN'S VOLLEYBALL (2017-2019)

Mariana SZABO-ALEXI∗
University of Oradea, Faculty of Geography, Tourism and Sport, e-mail: mariszabo@yahoo.com

Cătălin MIHĂESCU
A.C.S "Viitorul" Borș, e-mail: mihaescuc@yahoo.com

Cristian ȘANTA
Babes-Bolyai University, Faculty of Physical Education and Sport, Cluj-Napoca, e-mail: cristian.santa@yahoo.com

Paul Cătălin SZABO-ALEXI
University of Oradea, Faculty of Geography, Tourism and Sport, e-mail: szaboalexipaul@gmail.com

Abstract: Practicing the game of volleyball by millions of people, proves that it is one of the most beloved sports games in the world, in which it is aimed at keeping the ball in play in its own field in the best conditions and sending it as difficult as possible to the opposing court to force him to make mistakes. At the amateur level, the game is extremely attractive due to the lack of direct contact with the opponent, the involvement of all participants in the game and the easy-to-understand regulation. At the professional level, the game of volleyball excels through spectacularity, twists and reversals, therefore, increased tension for viewers. Many sports enthusiasts consider volleyball to be the team sport, in which every touch of the ball is directly influenced by the previous touch of a teammate or opponent. In this sense, each contact inevitably depends on the previous one and will then have an effect on subsequent contacts. However, as Karch Kilary (one of the greatest volleyball players of all time) says: "The game of volleyball cannot start without serving, and serving is the only technique that is totally under your control." (Kiraly, 2000). Thus, the service is the only technical process in which no previous contact directly affects the result of subsequent infringements. The other technical procedures such as passing, taking over, blocking or attacking make the difference between the teams in a match, but service remains the only technical process in which the player has direct control.

Key words: volleyball, attack, defence, service, efficiency.

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INTRODUCTION

The research on the efficiency, technique and accuracy of the service are also relatively numerous, but the data it reveals are relatively homogeneous, which denotes the specificity of the game and the peculiarities of the teams and echelons of training. Previous research on the efficiency of service kicks, carried out with maximum efficiency i.e. aces, were carried out by Monge (2001) which obtained a value of 40%, a relatively high value we could say if we compare

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∗ Corresponding Author

it with the one recorded by Anastasi (2011) which recorded an efficiency between 10-15%, at the level of the same echelon - division A.

The technical deficiencies highlighted by a low efficiency of the service facilitate the play of the opposing team. Within the teams in the upper echelon there is a constant concern to study the tactics of the opponent before the match, from the point of view of the team as well as individually, this also directing the training of the service to the areas or players with reception difficulties. The emphasis will be on improving the direction of the areas where the service will be performed, which will become a tactical weapon, which aims to increase the difficulty. In this case, the attacking phase I will suffer greatly giving its own team the opportunity to build its defense phase and counterattack phase II in accordance with the requirements of the coaches and the proposed objective, that of winning the point.

Over time, the service has gone through numerous transformations and attempts to increase the team's performance, by executing this game action both from a technical point of view and from the point of view of the force, speed and precision. If in the past the service was only the reinstatement of the ball, at present it is a formidable weapon for the team that owns it. "The service during the competitive game is manifested by specific individual executions, in which each player uses a single process adapted to his possibilities and perfected as such, by emphasizing one of the attributes: precision, force or gliding" (Ghenadi V,. 1984).

The evolution over time of the game of volleyball has also left its mark on the service, both in terms of "fixing the tests to one" and "on the diversity of the execution procedures" (Bac, O., Pop N., 1995). The diversity of services arose due to the constant concerns of players and coaches to find the ideal procedure that would combine the trajectory and intensity of the blow with precision and safety.

The technique at work has been constantly changing since its inception. Due to the changes in regulation, but also the evolution of the game and the players, the service can be the key element in a game of volleyball. In the "early period" (Bac, O., 1999) of volleyball, most of the services were performed from the bottom and did not put in too much difficulty the team at the takeover. This process is still preserved today in the mini-volley and beginner or amateur teams. The "classical stage (1947-1963)" is characterized, from the point of view of the service, by the appearance of the service from the side and the top one, procedures that went in parallel until the 80s, with an advance for the service from above, an increasingly consistent advance, until the almost complete disappearance of the service from the side, with the advent of the service from the jump. The jump service was first performed at the 1984 Olympics by Brazilian player Renan Dal Zotto. This type of service was quickly adopted by most teams, defending various variants of the service in the jump. We currently have the service in the jump in force, the service in the floating jump and the service in the hybrid jump, which is a combination of the two services mentioned above.

Figure 1 Jump Serve
(Source: http://www.volleyball-training-ground.com)

As for the speed of the ball reached at service, it is, on average, between 60 and 65 Km/h. The maximum service speed recorded for men's volleyball is 134 km/h (Ivan Zaytsev - Bulgaria). For women's volleyball, maximum values were recorded around 100 km/h. The main procedures for the execution of the service in the game of volleyball (Mârza, D., 2006) could be classified as such:
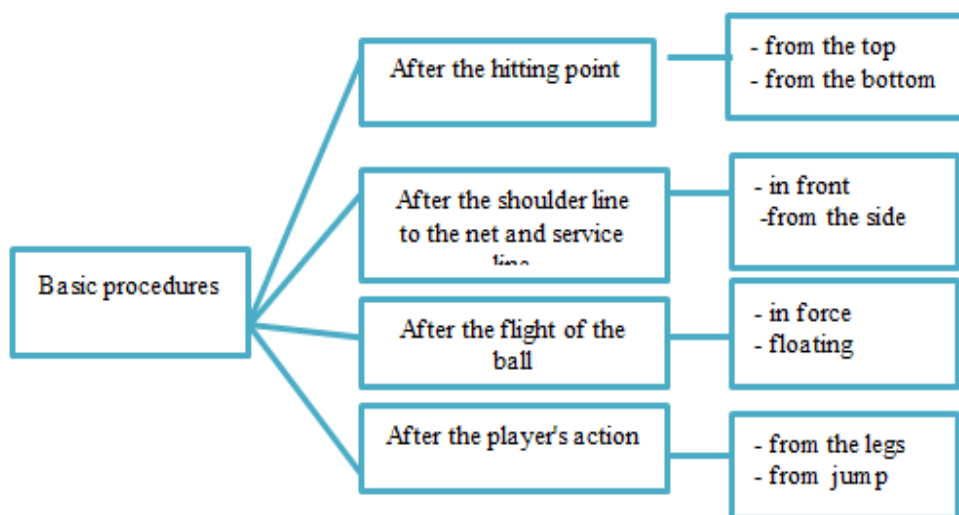
Figure 2 The main execution procedures of the service

Currently, the established execution procedures at work are: the service on the legs (in force and floating), the service in the jump in force and the service in the floating jump, processes that have been studied in the present research. With the upper echelons of the sports classification, the service becomes more and more perfected (whether it is run from the jump in great force or gliding), aspects that can lead to the end of the game cycle faster, without being able to continue with the next structures of the game. In the past, the services were executed mainly from zone 1 - about 80%, currently they are executed from all the areas that are behind the field: zone 1, zone 6, zone 5, depending on the tactics of the game approached by the opposing team in phase I of reception and the indications given by the coach both visually and verbally.

RESEARCH SUBJECTS

The research was carried out within the Women's National Volleyball Championship, the echelon of division A1, in the competitive seasons 2017-2018 and 2018-2019. The A1 Women's Division comprises a number of 10 teams, namely CSM Bucharest, CS Alba Blaj, CS Știința Bacău, CSM Târgoviște, ACS Agroland Timișoara, CSM Lugoj, CS Dinamo Bucharest, CS "U" NTT Data Cluj, ACS Penicilina Iași and CSU Medicina CSS Tîrgu Mureș. A number of 8 matches from the 2018-2019 competitive season were analyzed, carried out by the top 6 teams ranked at the end of the season. The matches were recorded personally with the help of a TV Tunner, from DigiSport TV broadcasts. The teams were, following the ranking at the end of the season, CSM Bucharest, CS Alba Blaj, CS Știința Bacău, CSM Târgoviște, ACS Agroland Timișoara and CS Dinamo București (Table 1).

Table 1 Research subjects

Teams	Average age (years)	Height (meters)	Nationality	
			Romanian	Another
CSM Bucureşti	26,5	1,84	5	6
Alba Blaj	28,2	1,84	3	8
Bacău	28,8	1,86	10	1
Târgovişte	28,6	1,84	5	6
Dinamo	25,1	1,81	11	0
Timişoara	23,1	1,81	10	1

According to the statistics existing on the website of the Romanian Volleyball Federation, in the 2018-2019 season, a number of 15,003 services were performed, out of which 1,303 aces and 1,431 wrong services were performed (Figure 3).
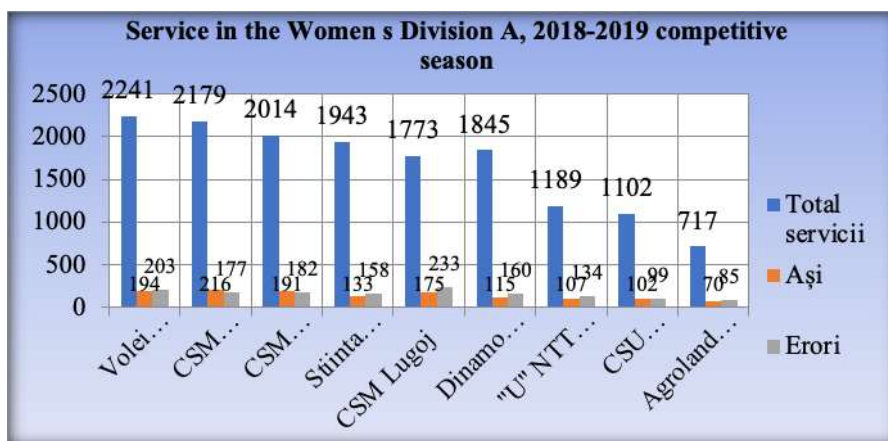
Figure 3 Service in the Women's Division A, 2018-2019 competitive season

MATERIALS AND METHODS

In this paper we watched a number of 8 official matches of the teams located on the first 6 places at the end of the 2017-2018 competitive season, in the first echelon of the Romanian women's volleyball. In these games we followed the services performed by both teams, in terms of their type, their directing to the different areas of the opposing field, their impact on the opposing defense. The study was conducted to highlight the efficiency and influence of the service in the game of volleyball, in the A1 Division of the National Women's Championship of Romania.

The service techniques were grouped into: Jump Serve (JS), Float Jump Serve (FJS) and Float Serve (FS). For each type of service, a number of parameters were recorded: the area from which the service was performed (Z), the defense area in the opposing court where the ball was directed (FZ), the result of the service highlighted by the quality of the reception ($0^+, 0^-$) and its influence in winning the point by the team that served, the number of aces and mistakes at service.

The effectiveness of a service can be quantified on the basis of the ability of the receiving team to receive the service. The reception of the ball is qualitatively analyzed based on the number of attack options that the lifter has, after the receptions is carried out. Thus, the more attacking options at their disposal, the more likely it is that the incoming team will win the point.

Therefore, we considered to divide the quality of the service, according to the quality of the reception, into two categories: 0^-, which determines a good reception quality, which allows the possibility of passing by the setter to at least 2 players on the attack in line 1, making tactical attacking schemes; 0^+, which determines a poor reception quality, after the 3-meter line of the field, the setter not having the possibility of passing the ball in good condition to the players in line1; the setter passes with two hands from below; the setter does not reach the second ball, which is passed by another player; the ball is passed into the opposing court without attack; "ace" we considered the services that fell directly into the opposing court without being touched by the players in the reception, but also those who had a poor reception, which did not lead to the return of the ball to the opposing court.

As for the area from which the service is performed, it corresponds to the area of the field, from the second line, according to the numbering of areas in the official regulation of the game of volleyball, respectively 1, 6 and 5, from left to right. Regarding the division of the land into zones for the receiving team, we numbered the areas according to the same criterion.

The data collection was made on an observation sheet designed specifically for the present work, made by hand, a sheet that respects the cifric language specific to the volleyball game. The objective pursued by the records made was both qualitative (their effectiveness, reflected in the quality of the receptions) and quantitative (the total number of services performed, per area of the volleyball field). The registration sheet includes the observation of the service on each set separately, but also cumulatively over the entire game, contested by both teams involved.

RESULTS AND DISCUSSION

In the eight matches analyzed, a number of 1,032 services were executed, of which: 95, representing 9% of the total services, were marked with "-",was wrong services; 58, representing 6% of the total services, were marked with "+", services that turned into a direct point for the team at reception; 601, representing 58% of the total services, were marked with "0^-", services that had a good quality reception; 278, representing 27% of all services, were denoted by "0^+", services resulting in poor reception quality.

• **Table 2** The quality of serve

Quality serv./ Process	-	0^-	0^+	+	Total
FS	23	154	64	15	256
% from FS	9%	60%	25%	6%	100%
% from TS	2%	15%	6%	1%	25%
JS	19	49	23	6	97
% from JS	20%	51%	24%	6%	100%
% from TS	2%	5%	2%	1%	9%
FJS	53	398	191	37	679
% from FJS	8%	59%	28%	5%	100%
% from TS	5%	39%	19%	4%	66%
Total	95	601	278	58	1032
	9%	58%	27%	6%	100%

From the point of view of the procedure used at service, we note the following: the most used procedure at service was the Float Jump Serve (FJS), with 679 services, representing 66% of the total services; the least used procedure was the Jump Serve, with only 97 executions, representing 9% of the total services performed; the Float Serve (FS) had a total of 256 executions, representing 25% of the total services.
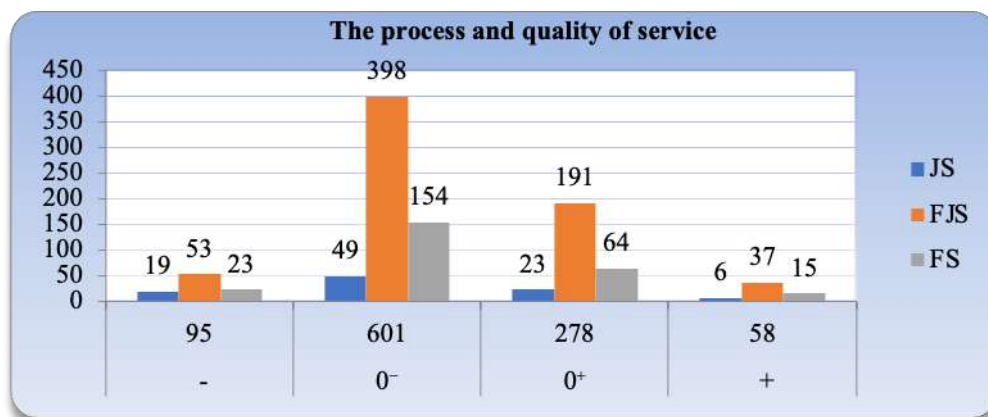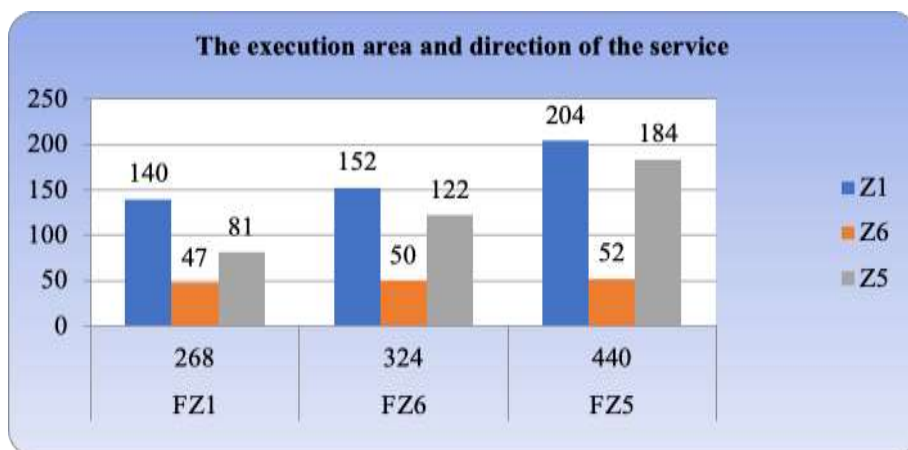

Figure 4 Comparative graph on the process and quality of service

In Figure 4 it can be seen that the highest number of aces was made from the FJS process (37 points directly from the service), but as a percentage, it was at the same level as those made from the other processes; the highest constancy was found in fs and FJS processes with only 9% and 8% of the respective wrong service process, respectively; The JS process was the most unsteady, with 19 wrong services, accounting for 20% of the total services of this kind; The process that generated the most poor quality receptions (0^+) was FJS, with 191 services, respectively 28% of the total FJS services and 19% of the total services; The FS and FJS processes generated good quality pickups in 60% of cases, while the JS process, which gives the ball a higher speed, had good receptions in 50% of cases.

Regarding the execution area, we note that most of the services were performed from zone 1 (496 services, representing 48% of the total services), followed by zone 5 with 387 services (representing 37.5%) and zone 6 (149 services, 14.4%).

Regarding the area of directing the service, we note that they were mainly directed to zone 5 (440 services, representing 42.6% of the total services), followed by zone 6 with 324 services, i.e. 31.4% and zone 1 with 268 services, representing 26% of the total services.

From the data presented we notice a more balanced distribution by area in terms of service targeting, compared to the execution area. We can also see that the services performed from zone 6 were directed equally to the 3 pickup areas, compared to the services performed from zone 5, which went to zone 5 of the opposing land (47.5% of the services executed in zone 5), representing a service with a straight trajectory, easier to execute. The services performed from zone 1 were also directed to zone 5 of the opposing land (41% of the total services performed from zone 1), followed by zone 6 (30.6%) and zone 1.

The execution area and direction of the service

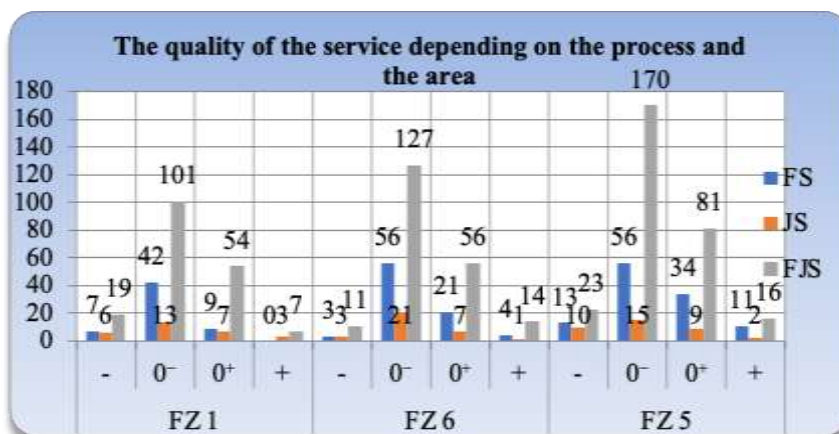**Figure 5** Comparative graph of the execution area and direction of the service

In figures no.6 and 7 we have graphically represented the quality and the process used at service, on each area of its execution, respectively on the targeting areas in this way: the services performed in zone 5 put in greater difficulty the opposing defense, regardless of the procedure used (121 services with a rating of 0^+, representing 31% of the total services performed in zone 5), compared to those in zone 1 (117 services, representing 23.5%) and those in zone 6 (40 services, 27%). Most of the wrong services were performed from zone 1 (48 services), the highest percentage being, however, in zone 5 (10.3% of the total services performed in this area).

The quality and the process used on each area of its execution
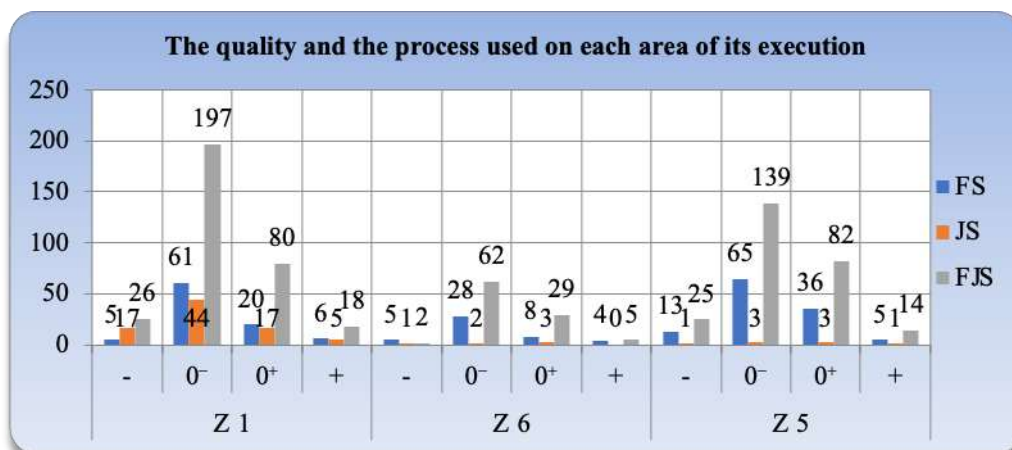
Figure 6 Comparative graph regarding the execution area, the quality of the service and the procedure used

The services performed to zone 5 put in greater difficulty the reception of the opposing team (124 services with a rating of 0^+, representing 28,2%), compared to zone 6 (84 services, 26%) and zone 1 (70 services, 26%); lowest percentage of wrong services were directed to zone 6 (5.2%), coming as a confirmation due to the placement in the middle of the field of this area; the largest number of aces were directed to zone 5 (6.6%), and as an execution process, the service in the jump in force has the highest percentage (6.2% of the total JS services).

Figure 7 Comparative graph regarding the targeting area, the quality of the service and the process used

Here are the following in both centralizing tables the distribution of services according to the area of their execution and targeting, for each match analyzed in the present paper.

From the analysis of table no.5 we can see the following: the minimum regarding the service performed from an area, was reached in the match no.7, with only 1 service executed from zone 6; most of the services performed from an area were performed in the match no. 4, with 105 services in zone 1; the average of the services performed in zone 1 was 62 services, 3.33 times more than those performed in zone 6; the standard deviation is even greater as the area of execution or direction to the service is less used.

Table 5 Statistical index on the distribution of services by execution area and its directions

Game	Z1			T Z1	Z6			T Z6	Z5			T Z5	Total
	FZ1	FZ6	FZ5		FZ1	FZ6	FZ5		FZ1	FZ6	FZ5		
TOTAL	140	152	204	**496**	47	50	52	**149**	81	122	184	**387**	1032
%	28%	31%	41%	**48%**	32%	34%	35%	**14%**	21%	32%	48%	**38%**	100%
MIN	4	9	11	**33**	0	0	1	**1**	2	9	6	**31**	113
MAX	32	31	50	**105**	22	12	18	**48**	14	20	47	**69**	146
AVG	17,5	19	25,5	**62**	5,875	6,25	6,5	**18,6**	10,1	15,3	23	**48,4**	129
STDEV	10,8	7,1	15,2	**27,5**	7,1	4,5	6,3	**16,5**	3,9	3,7	13,0	**13,6**	9,9
C.V	62%	37%	60%	**44%**	121%	72%	97%	**89%**	39%	24%	57%	**28%**	8%

Thus, we can see that the services directed from zone 5 to zone 6, has the lowest standard deviation (3.7) but also the highest degree of homogeneity (24%); the high and very high values of the calculated variability coefficient indicate a large and very high lack of homogeneity due to the large dispersion of the obtained data. Most of the matches analyzed were played between teams with different styles at work, hence the large dispersion of data.

From the data presented in table no.6 we can see the following: most of the wrong services were recorded in the match no.1, with the FJS, and the highest number of aces, in match no.8, with 9 services by the same FJS procedurę; the highest number of good quality services (0^+) were

registered in match no.2, with 33 services from the FJS process; the average quality services 0^+ of the FJS process was 23.9, almost 3 times higher than those of type FS and 8 times higher than those of type JS; the calculated variability coefficient recorded high and very high values, except in the case of the FJS service, which, as we could see, is the most used process at work, having a high constancy compared to the other processes. It recorded a coefficient of 20%, indicating an average variability in terms of FJS service.

Table 6 Statistical index on the quality of processes

Game	FS				T FS	JS				T JS	FJS				T FJS	T
	-	0^-	0^+	+		-	0^-	0^+	+		-	0^-	0^+	+		
T	**23**	**154**	**64**	**15**	**256**	**19**	**49**	**23**	**6**	**97**	**53**	**398**	**191**	**37**	**679**	**1032**
%	9%	60%	25%	6%	25%	20%	51%	24%	6%	9%	8%	59%	28%	5%	66%	100%
MIN	1	2	2	0	6	0	0	0	0	0	3	35	14	1	62	113
MAX	5	38	13	4	54	5	13	5	2	20	11	72	33	9	110	146
AVG	2,9	19	8	1,9	32	2,38	6,13	2,88	0,75	12	6,63	49,8	23,9	4,6	84,9	129
STDEV	1,2	11,5	4,0	1,5	15,8	2,1	4,8	2,2	0,9	7,4	2,4	14,6	6,0	2,4	16,9	9,9
C.V	43%	60%	50%	78%	49%	90%	79%	75%	118%	61%	37%	29%	25%	53%	20%	8%

CONCLUSIONS

Following the interpretation of the data collected in the graphs and tables drawn up, we conclude the following: the first 6 teams of Romania, in the 8 analyzed matches, mainly opted for zone 1 as the service execution area (48% of the total services) and for zone 5 as its targeting area (42.5%); the most used procedure at service was Float Jump Service (66%), and the least used, the Jump Service (9%); percentage of aces achieved was 6% of the total services, compared to 9% of the percentage of wrong services; services noted with good quality represented 27% of the total services, 2.15 times fewer than those that did not pose problems of taking over from the service. They were mainly directed to zone 5, being executed from zone 5, and the most used procedure was the Float Jump Service. Most unsteady procedure was the Jump Serve, with a percentage double that of the other procedures. This can also be influenced by the relatively small number of players who master this procedure, only 4 of the 6 teams analyzed using the Jump Serve. The Jump Serve can be very useful in increasing defensive "conflict zones" for the purpose of direct registration of "aces", or to make it difficult to play offensively following the reception of the service. Share of tactical services, directed to the areas of line 1, was below 0.5% per game, which is why these services were not taken into account. Tactics at service are different from match to match, in terms of both the area from which the service is performed and the area of its targeting, especially for the teams located at the top of the ranking, CSM Bucharest and Volleyball Alba Blaj.

By watching the execution of the services we noticed the lack of variation in terms of the distance from the bottom line of the field, most of the Float Services being from the boundary of the field.

The results obtained are in line with those reported by other studies, which have shown that the Jump Service is the one that creates the most aces, but at the same time the technique that

generates the most mistakes. This must be taken into account in the crucial phases of the game, the service techniques having to be used strategically.

REFERENCES

Anastasi A. (2011), Volley-ball Final Report. 22nd Edition, *World League*, Palermo;

Bâc, O., (1999), Volleyball, *Editura Universitatii din Oradea*, Oradea.

Bâc, O., Pop N., (1995) Volei 100 de ani, *Editura Paco Press*, Cluj Napoca.

Dafinoiu, I. (2002), Personalitatea. Metode calitative de abordare: Observatia si interviul, *Editura Polirom,* București.

Drăgan, A., (2000), Volei – noţiuni de bază, *Editura Fundaţiei România de Mâine*, București.

Gagea, A. (2010), Tratat de cercetare ştiinţifică în educaţie fizică şi sport, *Editura Discobolul*, București,

Ghenadi, V., (1984), Modelarea instruirii copiilor şi juniorilor, *Editura Sport – Turism,* Bucureşti.

Joseph M. Elftmann (2012), The effectiveness of serve location in Division 1womens volleyball, Sacramento.

Lenberg, K., (2006), American Volleyball Coaches Association - Volleyball skills & drills, *Editura Human Kinetics* SUA.

Maroti, Ş. (2006), Metodologia cercetării ştiiţtifice în educaţie fizică şi sport, *Editura Universităţii din Oradea*, Oradea.

Mârză, D.- (2006), Volei - Bazele teoretice şi metodice, *Editura Pim*, Iaşi.

Monge B. (2001), Handbook, *Australian Volleyball Masters*. Easter Tournament, Canberra,.

Mureşan, A. (2005), Volei strategie şi tactică, *Editura Accent*, Cluj-Napoca.

Renato, M., (1996) Bazele teoretice ale antrenamentului sportiv, *Editura CCPS*, București.

Roşca, E. (2012), Studiu privind eficientizarea loviturii de atac plasate in jocul de volei, prin training atenţional, *Palestrica Mileniului III –Civilizaţie şi Sport*, Vol. 13, no. 3.

Rusu, Flavia (2000), Curs de volei, note de curs, uz intern, *Editura F.E.F.S., U.B.B.,*Cluj-Napoca.

Shondell, D. (2006) Volleyball Coaching Bible, *Editura Human Kinetics*, SUA.

Şerban, M., de Hillerin P. (1984), Volei - Strategie şi tactică, *Editura Sport-Turism*, București.

Teodorescu, S. (2009), Antrenament și competiție, *Edit. Alpha MDN*, București.