

Examining the Attacks After the 20th Scores in Volleyball According to Nationality and Positions

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Abstract

The most efficient technique of scoring in volleyball is possible to be mentioned as attack. The numbers of efficient attacks performed after the 20th scores during the match are more important, and therefore this period should be managed more elaborately in terms of the technique and tactic. Therefore, it is considered that players' presenting more productive performances with the drills related to the match after the trainings will be more efficient upon winning the match.

The purpose of this study was to investigate the attacks performed after the 20th scores in 2017-2018 Volleyball Sultans League session according to the nationalities and positions. The study included totally 124 female players with natives (n=86) and foreigners (n=38) from 12 teams between 26 and 30 years old (28.25±1.62). The numbers of the attacks performed after the 20th scores of 17.918 rallies in 496 sets (except from the 5th set) of 125 matches played by 12 teams during the session were evaluated. All matches were recorded with a video recorder by the researcher. The videos were analyzed by the experts in 3 repetitions. Attack errors, blocked attack, bad attacks, good attacks, numbers of attacks, coverage and totals numbers of attacks performed after the 20th scores during the match were recorded in numbers. Lilliefors Kolmogorov-Smirnov Test indicated whether the study data were appropriate for the normal distribution or not (p<.05). In data analysis, descriptive statistics such as number, percentage, arithmetic average and standard deviation were used; and Independent Samples T-Test and One-Way Variance Analysis (One-Way ANOVA) were used for determining the difference between dependent and independent variables. Tukey HSD Post-Hoc test was performed for finding among which groups there were differences between the units in one-way variance analysis (ANOVA). While interpreting the data, 0.01 and 0.05 were accepted as the level of significance. The research data were analyzed using SPSS 21 statistical software.

As result of the findings obtained in the study, it was determined that there were significant differences in whole attacks performed by the players in terms of nationalities and positions (p<0.05). In conclusion, because the 20th scores are referred the critic period called as the golden scores, foreigners and opposite spiker's that had high level conditional abilities for winning had more attacks.

Keywords: Attack efficiency, nationality, position, golden rallies, score

1. Introduction

Volleyball is a dynamic sport depending upon intermittent jumps, short sprints, strength, dynamism, flexibility, endurance, and leaping blocks and attacks without depending upon time with a high tempo (Puhl, Case, Fleck, & Van Handel, 1982; Bazylar et al., 2018). Average working-resting rate in a volleyball match varied between 1 and 1:1, and the matches can go on for 2-3 hours depending upon the number of sets including resting periods for 11-15 seconds (Bazylar et al., 2018).

In volleyball, there are several movements apart from shooting the ball we perform with the members of our body during the match. The players should take the right position on both vertical and horizontal axis. The movements that will be performed on horizontal axis before the attack provide the maximum opportunity for players to achieve the best result (Pérez Turpin, Cortell-Tormo, Suarez-Liorca, Chincilla-Mira, Cejuela-Anta, 2009; Alptekin, Acet & Korkmaz, 2016).

The most efficient technique of getting the score in volleyball is possible to be mentioned as attack. Therefore, one of the necessary basic physical abilities as being important for attacks and blocks is lower extremity muscle strength expressed with numerous jumps performed during the matches (Sheppard et al., 2008; Sheppard et al., 2007; Sheppard, Gabbett & Stanganelli, 2009; Giannopoulos et al., 2017). The number of attacks after receiving the service and efficiency of receiving the service determines winning or losing the match. It has been reported that attack and block are the abilities that provides taking the most scores, and therefore these abilities should be focused during the trainings (Häyrinen & Tampouratzis, 2012).

Each team tries to finish action of playing with a strong spike for winning the match. All movements of attack are necessary while preparing for the attack, and success and failure are the final elements of the movement. Spike could not be fully performed by the players who had no high-level conditional abilities. Cognitive properties, tactical knowledge and previous experiences are remarkable in terms of successful attacks. The chance for a successful attack increases when all these factors are developed at a high level and the teams use varieties of attacks including numerous group tactics (Frohner, 1989; Sentuna, 2005). In volleyball, the teams win most of the scores from the attacks; therefore, efficiency of the attack is one of the most important determinants of victory (Challoumas & Artemiou, 2018).

In general, the attacks performed after the 20th scores the rate for the attack efficiency can be mentioned as decreasing because of being in the golden number period for winning the match; however, the studies carried out on this are limited. Our purpose was to investigate the attacks performed after the 20th attacks in volleyball according to the nationalities and positions.

2. Method

2.1 Research Model

Descriptive research model was used in the research. The attack errors, blocked attack, bad attacks, good attacks, numbers of attacks, coverage and total numbers of attacks performed after the 20th scores in 2017-2018 volleyball Sultans League session were examined according to the nationalities and positions of the female players.

2.2 Research Group

The research group included 124 Turkish and foreign-national female players in the teams in 2017-2018 Sultans League session. The descriptive statistics related to the research group were presented in Table 1.

Table 1. The descriptive statistics related to the research group

Variables	Gender	N	%
Nationality	Turkish	86	69.4
	Foreigner	38	30.6
Position	Hitter	42	33.9
	Opposite Spiker	22	17.7
	Middle Blocker	41	33.1
	Setter	19	15.3
Total		124	100.0

2.3 Collection of Data

The research data were obtained from 496 sets and 17.918 rallies during 22 weeks of 12 teams in Sultans League. Because the research topic included the attacks after the 20th scores, the data of the 5th set were excluded from the study. Data of the 124 players were included into the analysis for evaluating the attack data after the 20th scores.

2.4 Data Analysis

The distribution was regarded before analyzing the data of the research. Lilliefors Kolmogorov-Smirnov test proved that data of the study were not appropriate for the normal distribution ($p < .05$). Histogram graphic and normal distribution curve were determined with Skewness (+1 and -1) and Kurtosis (+2 and -2), and the analyses were performed according to this. In data analysis, descriptive statistics such as number, percentage, arithmetic average and standard deviation were used; and Independent Samples T-Test and One-Way Variance Analysis (One-Way ANOVA) were used for determining the difference between dependent and independent variables. Tukey HSD Post-Hoc test was performed for finding among which groups there were differences between the

units in one-way variance analysis (ANOVA). While interpreting the data, 0.01 and 0.05 were accepted as the level of significance. The research data were analyzed using SPSS 21 statistical software.

3. Findings

The averages and standard deviation values related to the attack errors, blocked attack, bad attacks, good attack, numbers of attack, coverage and number of total attacks performed after the 20th scores during the session by the volleyball players in the research group were presented in Table 2.

Table 2. The averages related to the attacks of the players during the session

Variables	N	M	SD
Attack Error		3.67	4.566
Blocked Attack		3.77	4.286
Bad Attack		11.44	12.859
Good Attack	124	5.86	6.416
Number of Attacks		19.48	20.406
Coverage		2.73	3.129
Number of Total Attacks		46.95	46.588

When Table 2 was analyzed, it was noticed that the average of the attack errors performed by the players in all positions during the session was 3.67 (Sd=4.566), the average for the good attack was 5.86 (Sd=6.416), and the average for the bad attacks was 11.44 (Sd=12.859).

The analysis results related to the attack errors, blocked attack, bad attacks, good attack, numbers of attack, coverage and number of total attacks performed during the session by the volleyball players in the research group according to their nationalities were presented in Table 3.

Table 3. The attacks according to the nationalities of the players

	Nationality	n	M	SS	SD	t	p
Attack Error	Turkish	86	2.44	4.036			
	Foreigner	38	6.44	4.524		-4.907	.000*
Blocked Attack	Turkish	86	2.44	3.516			
	Foreigner	38	6.76	4.401		-5.827	.000*
Bad Attack	Turkish	86	7.25	10.495			
	Foreigner	38	20.92	12.794		-6.240	.000*
Good Attack	Turkish	86	3.50	4.402			
	Foreigner	38	11.21	7.071		-7.393	.000*
Number of Attacks	Turkish	86	11.08	13.604			
	Foreigner	38	38.50	20.581		-8.773	.000*
Coverage	Turkish	86	1.80	2.467			
	Foreigner	38	4.81	3.478		-5.500	.000*
Number of Total Attacks	Turkish	86	28.52	35.181			
	Foreigner	38	88.65	42.383		-8.230	.000*

*p<0.05.

When Table 3 was analyzed, it was determined that there were significant differences in all attacks performed by the Turkish players and foreign-national players (p<0.05). According to this, attack errors ($M_{Turkish}=2.44$; $M_{foreigner}=6.44$), blocked attack ($M_{Turkish}=2.44$; $M_{foreigner}=6.76$), and bad attacks ($M_{Turkish}=7.25$; $M_{foreigner}=20.92$) of the Turkish players were found to be lower than the foreign-nationality players.

The analysis results related to the attack errors, blocked attack, bad attacks, good attack, numbers of attack, coverage and number of total attacks performed during the session by the volleyball players in the research group according to their positions were presented in Table 4.

Table 4. Attacks according to the positions of the players

	Position	n	M	SS	Sd	F	p	Tukey HSD
Attack Error	Hitter (H)	42	4.83	3.780	3	21.650	.000*	H < OP
	Opposite Spiker (OS)	22	8.22	6.809				H > MB
	Middle Blocker (MB)	41	1.53	1.566				OP > MB
	Setter (S)	19	.42	.606				
Blocked Attack	Hitter (H)	42	5.07	3.959	3	21.791	.000*	H < OP
	Opposite Spiker (OS)	22	7.77	5.714				H > MB
	Middle Blocker (MB)	41	1.87	1.791				OP > MB
	Setter (S)	19	.31	.582				
Bad Attack	Hitter (H)	42	16.69	13.717	3	18.722	.000*	H < OP
	Opposite Spiker (OS)	22	20.95	15.508				H > MB
	Middle Blocker (MB)	41	5.70	5.144				OP > MB
	Setter (S)	19	1.21	1.315				
Good Attack	Hitter (H)	42	8.14	6.989	3	15.600	.000*	H < OP
	Opposite Spiker (OS)	22	10.50	8.028				H > MB
	Middle Blocker (MB)	41	3.34	2.584				OP > MB
	Setter (S)	19	.89	1.048				
Number of Attacks	Hitter (H)	42	23.90	19.732	3	16.318	.000*	H < OP
	Opposite Spiker (OS)	22	37.09	26.722				H > MB
	Middle Blocker (MB)	41	13.58	11.588				OP > MB
	Setter (S)	19	2.05	1.614				
Coverage	Hitter (H)	42	4.28	3.637	3	11.365	.000*	H > MB
	Opposite Spiker (OS)	22	3.63	3.302				OP > S
	Middle Blocker (MB)	41	1.73	2.000				
	Setter (S)	19	.36	.597				
Number of Total Attacks	Hitter (H)	42	62.92	45.120	3	22.536	.000*	H > MB
	Opposite Spiker (OS)	22	88.18	57.406				OP > MB
	Middle Blocker (MB)	41	27.78	21.146				
	Setter (S)	19	5.26	3.380				

*p<0.05.

When Table 4 was analyzed, it was determined that there were significant differences in terms of attack errors, blocked attack, bad attacks, good attack, numbers of attack, coverage and number of total attacks depending upon the positions of the players ($p<.05$). According to this, hitters had lower averages rather than the opposite spikers, middle blockers had higher averages, and opposite spikers had higher averages rather than the medium blockers and setters in terms of attack errors, blocked attack, and number of attacks. In terms of coverage and total number of attacks, it was determined that hitters had higher averages than the medium blockers and setters and opposite spikers had higher averages rather than the setters.

4. Discussion

Volleyball teams' getting most of the scores from attack makes this technical skill remarkable (Challoumas & Artemiou, 2018). Therefore, the situations that appear behind the successful and failed attack have become the concern of sports scientists and trainers.

According to the findings, when Table 2 was analyzed, it was noticed that the average of the attack errors performed by the players in all positions during the session was 3.67 (Sd=4.566), the average for the good attack was 5.86 (Sd=6.416), and the average for the bad attacks was 11.44 (Sd=12.859).

When Table 3 was analyzed, it was determined that there were significant differences in all attacks performed by the Turkish players and foreign-national players ($p<.05$). According to this, attack errors ($M_{Turkish}=2.44$; $M_{foreigner}=6.44$), blocked attack ($M_{Turkish}=2.44$; $M_{foreigner}=6.76$), and bad attacks ($M_{Turkish}=7.25$; $M_{foreigner}=20.92$) of the Turkish players were found to be lower than the foreign-nationality players.

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total number of attacks, it was determined that hitters had higher averages than the medium blockers and setters and opposite spikers had higher averages rather than the setters.

According to the results of the research, it was necessary to test several hypotheses in order to find the factors determining the quality of the attack. Costa et al. emphasized that the percentage of elite male volleyball players' receiving the service perfect was proportional with the score taken from the attack and fast attack (Costa et al., 2017). In a study, it was determined that efficient service decreased the quality of receiving the service and this decreased the efficiency of attack (Costa et al., 2011; Castro, Souza, & Mesquita, 2011).

In today's volleyball, attack has become so remarkable that Sato et al. developed a block machine for perfecting this skill, and tested its validity (Sato et al., 2017). During the attack, several coverage systems are used for getting the blocked balls into the game again (Hileno, Alcaraz, Busca, Salas, & Camerino, 2018). In another study, Costa et al. indicated that efficiency of attack could change depending upon the double and triple block (Costa et al., 2014).

It was emphasized in another study that attack efficiency of the elite male players was more efficient in 1st tempo, namely fast, attacks (Costa et al., 2011). Afonso et al. suggested that evaluation of attack efficiency in middle blockers well by the rival blockers was fairly determinative for the fast attack (Afonso & Mesquita, 2011).

Challoumas and Artemiou emphasized the importance of the score taken by the attack upon winning the match, and expressed that the studies to be carried upon developing vertical leaping and attack technique would improve the attack performance (Challoumas & Artemiou, 2018). Medeiros, Mesquita, Marcelino & Palao stated that attack efficiency was highly relational with the technique and age (Medeiros, Mesquita, Marcelino, & Palao, 2014). Nikos and Elissavet reported that the number of score from the attack increased as the efficiency of the setter increased (Nikos & Elissavet, 2011).

Castro et al. examined the relationship between defense and attack and determined that bad quality of the ball from the defense especially decreased the quality of fast attack quality (Castro & Mesquita, 2010). Silva et al. found in their research that attack error had a significant role in teams' winning or losing the match (Silva, Lacerda & Joao, 2013). Marcelino, Sampaio & Mesquita reported that the scores at the end of the sets were more important, and therefore this period should be managed more elaborately in terms of technique and tactic. Furthermore, training the players in a way similar to the real with selected drills at the end of the trainings was emphasized to be more beneficial for the players (Marcelino, Sampaio, & Mesquita 2012). Due to these reasons, it is necessary to have a more disciplined and long-period work-outs at the end of the trainings considering the factors requiring to be more successful in attack. During the session, efficient attack work-outs related to the weaknesses and strengths of the rivals in training programs. In conclusion, success components of attack are broad in content (such as good technique and tactic, productive performance, efficient setter, attack without block, efficient receiving of the service, good attack, etc.). It was emphasized in several studies that the scores taken at the end of sets and match were remarkable, and the scores in these stages were efficient upon the score of the match. In this sense, 20th scores could be named as the golden scores, and it could be noticed that opposite spikers and foreign-national players took more responsibility in this critical period.

In this sense, this study could be considered as remarkable for physical education and sport scientists because the researches carried out on the need of volleyball players for attack performance analyses during the match were limited. Furthermore, this study could be mentioned as having a quality shedding light on the further studies.

Due to these reasons, technic-tactic work-outs and repetitions in matches could cause the improvement of leaping ability contributing upon the acceleration of neuro-muscularity and strengthening of the muscles. The research should consider this, should discover new and specific usability styles and expectation movements, and should regard gaming dynamics more profoundly.

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