ANALYZING THE SHOT PREFERENCES IN SINGLE-MEN' AND SINGLE -WOMEN'S MATCHES OF BADMINTON CHAMPIONSHIPS AND THE EFFECTS ON MATCH SCORES

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ABSTRACT

The present study aims to examine each rally played by single-man and single-woman players in Olympic, European, and World championships at finals and semi-finals from the aspect of shot preferences, as well as examining the effects of those shot preferences on the match scores. The study group consists of 20 athletes that played in final and semi-final singles matches. In the present study, the match videos uploaded to Kinovea program were played by reducing to the 3-30% of the normal play speed, and the shots preferred by the athletes were accurately recorded. In order to evaluate the effects of shooting technics on the match score, the independent sample t-Test was employed (Mann-Whitney Test) ($p<0.05$). It was determined that the shots mostly preferred by the male athletes were lop and net drop, whereas the least preferred type was found to be the drive. Among the female athletes, the most preferred shooting technics were clear and lop, whereas the least preferred shot was drive. Given the results related with the effects of shots preferred in scores won on the match scores, it was determined in independent t-Test results that there were statistically significant positive differences between match score and drop ($r=0.03$) and lop ($r=0.02$) among the shots received and lop ($r=0.045$) from the defense among the shots, from which the score was made ($p<0.05$). In conclusion, it was determined that, when compared to the male athletes, the female athletes kept the ball in the match longer. It can be said that the badminton athletes play a defense-oriented match and thus they win the matches by pressing the opponents into failure.

Keywords: *Badminton, Match Analysis, Shot Preference*

INTRODUCTION

For the sport branches, the performance analysis results provide a significant advantage for structuring the athletes' match strategies and training programs. The match analysis is of significant importance since it reveals the strengths and weaknesses of athletes and provides important feedback about the points to be considered in programming the trainings (Liddle et al., 1996; Bayansalduz, 2012; Can et al., 2014; Sahin and Guclu, 2018). In racket sports, especially in badminton matches, it is very important to make a decision rapidly and, thus, processing the data is very useful for the athletes. It is very difficult to catch the shot by opponent within split seconds and to make a shot that would answer the action of one's opponent in a most accurate manner. The motoric development might yield in results such as rapidly gaining the ball, hard shots, and enduring for a longer time. However, in order to make the most accurate shot against the opponent, it is very important to evaluate the feedbacks obtained from the analyses.

In European countries, which are at high rankings in badminton discipline, the matches are recorded and all the rallies are analyzed by focusing on the perfect technic via 3D biomechanical studies (Abián et al. 2014; Vicen et al., 2013). Moreover, regularly entering "how many shots were on target" and "how many shots were not" right after the ball feeding trainings in exercise clearly shows the importance of tactical analysis studies and sports technologies (Blomqvist 2001).

In the present study, it was aimed to evaluate every rally, which has been played in final and semi-final matches of top-level championships, from the aspect of shot preferences and to examine the effects of these shots preferred on the match scores. Within this context, by presenting the analysis results, it was aimed to provide the practitioners working on this subject with technical and tactical support.

METHODOLOGY

Subjects

The study group consists of 20 athletes (10 female and 10 male athletes), who played in final and semi-final singles' matches in European, World, and Olympic championships in 2016 and 2017. 40 matches played by these top-level athletes were examined.

Procedures

In this study, the match videos uploaded to Kinovea program were played by reducing to the 3-30% of the normal play speed, and the shots preferred by the athletes were accurately recorded by focusing on them. Without skipping any of

the rallies, the shots in each rally were recorded on the match tracking form that was prepared. The sum of shots made by the athletes in all the technics, the technics in which they failed and the sums of these technics, the technics in which they scored and the sums of these technics, and the shot rates of female and male athletes were examined.

Statistical Analyses

The mean values and standard deviations of the numbers of shots preferred by top-level badminton players during the matches were determined by using descriptive statistics. In order to determine the normality of distribution, the Kurtosis and Skewness values were considered and the Kolmogorov-Smirnov test was applied. After determining that the values fitted to the normal distribution, the parametric statistical tests were performed. In order to evaluate the effects of shooting technics on the match score, the independent sample t-Test (Mann-Whitney Test) was applied ($p<0.05$).

RESULTS

Table 1. *Mean values and standard deviations for the anthropometric and demographic characteristics of the athletes involved in the present study*

	Sex	**N**	**Mean**	**StD. S.**
Age	Male	10	29.2	4.33
	Female	10	23.3	1.89
Height (Cm)	Male	10	184.8	7.39
	Female	10	171,2	7.59
Weight (Kg)	Male	10	76.3	9.17
	Female	10	62.8	5.83
Total years in sports	Male	10	21.7	3.19
	Female	10	16.3	1.92

It was determined that the mean age was 29.2±4.33 years for male athletes and 23.3±1.89 years for females. The mean height was found to be 184.8±7.39cm for males and 171.2±7.59cm for females. The mean weight was determined to be 76.2±9.17kg for male athletes and 62.8±5.83kg for female athletes. Finally, the mean experience in sports was found to be 21.7±3.19 years for males and 16.3±1.92 years for females.

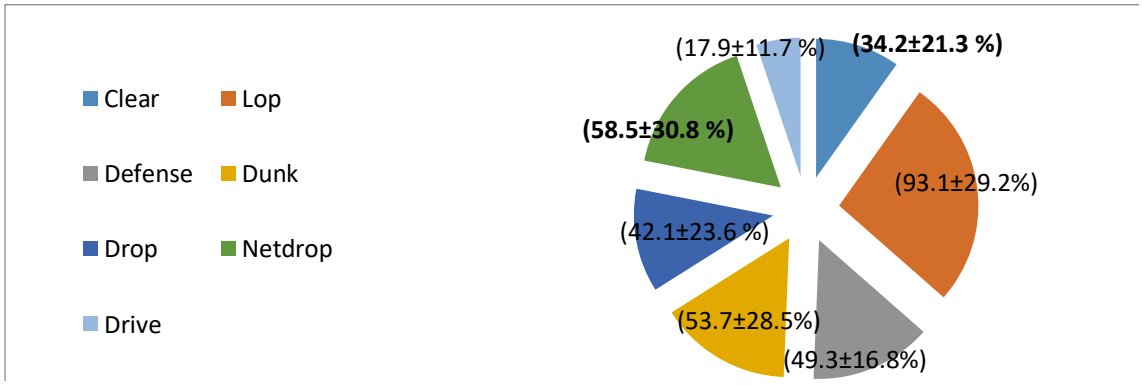

Figure 1. *Mean values and standard deviation for the shot preferences and the total number of rallies for male athletes*

In Figure 1, it can be seen that the shots preferred by male athletes at most are lop and net drop, whereas the least preferred shot was drive. Moreover, the mean number of rallies during the match was determined to be 77.9 ± 19.1.

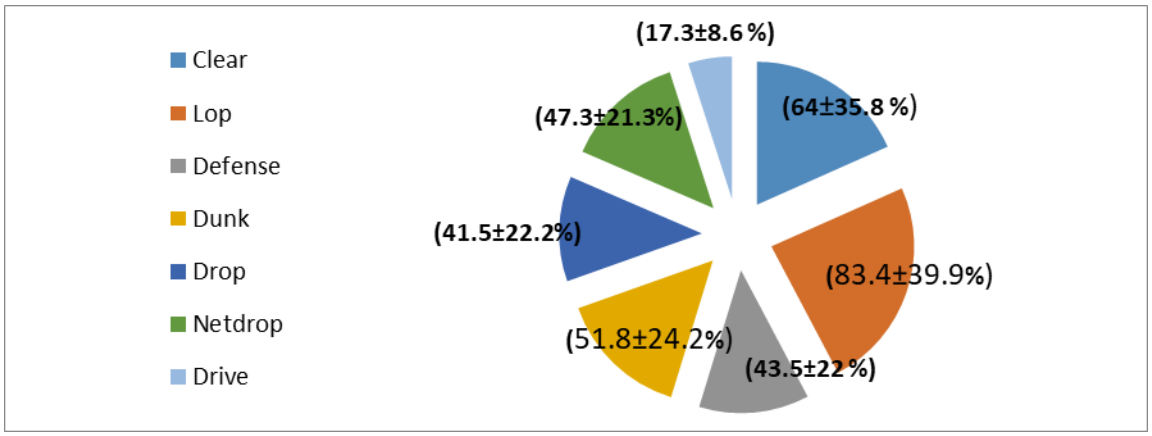

Figure 2. *Mean values and standard deviation for the shot preferences and the total number of rallies for female athletes*

In Figure 2, it can be seen that the shots preferred by female athletes at most are clear and lop, whereas the least preferred shot was found to be the drive. Moreover, the mean number of rallies during the match was determined to be 85.2± 23.

Table 2. *Mean values, standard deviations, and independent t-Test results for the preferred shots, which male badminton athletes scored*

Scoring Shot Preference	Result	N	Mean	Std. D.	P
Clear	Win	10	3.1	1.5	.448
	Loss	10	2.4	2.3	
Lop	Win	10	6.5	1.9	**0.02**

	Loss	10	4.5	1.7	
Defense	Win	10	3.5	2.3	.362
	Loss	10	2.5	2.4	
Smash	Win	10	13.5	4.1	.207
	Loss	10	10.3	6.4	
Drop	Win	10	3.7	1.4	**0.03**
	Loss	10	1.8	1	
Net Drop	Win	10	5.7	3.1	.363
	Loss	10	4.3	3.5	
Drive	Win	10	2.4	2	.196
	Loss	10	1.3	1.5	

In Table 2, it can be seen that the smash is the shot most frequently preferred by male badminton players in order to score. According to the independent t-Test analysis, among the shots from which the points were gained, drop (r=0.03) and lop (r=0.02) were found to have a statistically significant positive relationship with the match result (p<0.05).

Table 3. *Mean values, standard deviations, and independent t-Test results for the preferred shots, which female badminton athletes scored*

Scoring Shot Preference	Result	N	Mean	Std. D.	P
Clear	Win	10	5.1	2.3	.461
	Loss	10	4.3	3	
Lop	Win	10	4.6	1.5	**.045**
	Loss	10	6.9	3.5	
Defense	Win	10	2.4	1.8	.646
	Loss	10	3.1	2.2	
Smash	Win	10	13.6	4.8	.830
	Loss	10	9.2	4.9	
Drop	Win	10	5.1	2.6	.333
	Loss	10	3.1	1.9	
Net Drop	Win	10	6.2	4	.565
	Loss	10	4.4	3.1	
Drive	Win	10	2.2	1.8	.293
	Loss	10	1	1.2	

In Table 3, it can be seen that the smash is the shot most frequently preferred by female badminton players from the aspect of influencing the result of the match. According to the independent t-Test analysis, among the shots from which the points were gained, lop (r=0.04) was found to have a statistically significant positive relationship with the match result (p<0.05).

DISCUSSION

The match analyses are useful as long as they can determine which data are more effective in improving the performances of the players (Carling et al., 2009).

From this aspect, determining the strengths and weaknesses of the athletes during the match and their failures would contribute to their development (Hughes and Bartlett, 2008; Bayansalduz, 2014). Moreover, the results of match analyses can also be used in determining the weaknesses and strengths of the opponents and establishing the optimal strategies including the selection of players (Carling et al., 2005). Besides that, determining the shot types and the frequency of preferring them would increase the benefit of match analyses.

In the badminton matches, the number of rallies and also the duration vary depending on the playing characteristics of the athletes, their defense and offense skills, and their preferences. In the present study, the number of rallies was determined to be 77.9±19 for male athletes and 85.2±23 for female athletes. It can be seen that, when compared to the males, the female athletes keep the ball in the match for a longer time. In the studies carried out on this subject recently, Ming et al. (2008) analyzed the badminton matches played in Malaysia and reported the number of rallies to be 70.3 ± 1.3 - 97 ± 6.7. In another chronological study, the number of rallies was reported to be 68.4 ± 12.8 and 70.3 ± 1.3, respectively, for the male athletes (Abdullahi (2018), Abdullahi and Coetzee (2017)). In the present study, the number of rallies during the match was reported to be 77.9 ± 19.1 for the male athletes and 85.2± 23 for the female athletes. These results are similar to the results reported in previous studies.

One of the other parameters analyzed is the type of shot preferred. It is attention-grabbing that there is no discussion in the literature on the distribution of shots during the match. In some of the studies in the literature, the most frequently preferred types of shot were reported to be lop, net drop, and smash (Laffaye et al., 2015; Yuen-Ming and Youlian, 2000). In similar studies, it was reported that the young badminton players preferred mostly the lop and net drop (Chiminazzo et al., 2018; Ming et al., 2008), whereas another study reported the most frequently preferred types to be drive (122.1) and clear (118) (Abdullahi, 2018). In the present study, the values reported for female athletes (lop 83.4±39.9, clear 64±35.8, and smash 51.8±24.2) and male athletes (lop 93.1±29.2, net drop 58.5±30.8, and smash 53.7±28.5) show similarities with some studies and difference from some other studies.

In a study analyzing the percentage distribution of the shot types, it was reported that the most frequently preferred ones were lop (19.9%), net drop (18.7%), and clear (17.7%) (Lee et al., 2000). In the present study, the most frequently preferred types of shot were reported to be lop (27%), net drop (17%), and smash (15%) for male athletes and lop (24%), clear (18%), and smash (15%) for female athletes. It can be said that, in harmony with the literature, the most frequently preferred type of shot is not the smash, that the players played the

match in a defense-oriented way, and that they thus apply a strategy aiming to win the match by forcing the opponent into failure.

Besides that, the smash that is considered the most valuable shot from the aspect of the influence on the result in badminton matches was showed to constitute 12.5% of the shots in total (Jaitner and Gawin, 2010). It is a reality that the smash method is a very important shot in badminton match. However, unless the opponent makes it possible, it is not always possible to apply this method. Although it has a small share in shot percentages, it has an important effect on the result. The smash was the most frequently used shot to kill and win a rally, followed by the net and hit. A significant relationship was found between the total number of shots made by winning and losing players ($p<0.05$-1.96 and $p<0.01$-2.57) (Yuen-Ming and Youlian, 2000). Moreover, since it requires perfect coordination between all the body parts necessitating high energy (Li et al., 2017), smash may increase the level of fatigue if it is applied too frequently (Abdullahi and Coetzee, 2017). From this aspect, since many matches are played in large-scale organizations such as the Olympics, it can be said that this is not a good game strategy. As seen in the results in the present study, this opinion is corroborated by the fact that the smash is the third most frequently preferred shot. It can be stated that the badminton players played defense-oriented games and they win the matches by forcing the opponents into failure. In the present study, the smash is the third most frequently preferred shot type for the female and male athletes. However, it is the first from the aspect of points won. From the aspect of the effects of shot preferences in points won on the match result, it was determined that there was a statistically significant positive difference between the match result and the drop ($r=0.03$) and lop ($r=0.02$) for male athletes and lop from defense ($r=0.045$) for female athletes ($p<0.05$). In a previous study, the shots made by males and females were compared. In this study, it was reported that smash, net drop, and lob shots were more frequently used in men's final matches and clear, drop, and drive shots in men's final matches (Valldecabres et al., 2017).

CONCLUSION

Considering the effect of shot preferences on the match result, it can be seen that the shots most preferred by the badminton players in top-level and long-staged tournaments were defense-oriented ones. It can be said that, for the male athletes, the points won from the defense are more effective in winning the match as a result of lob and drop shots. For the female athletes, it is another important result that the female athletes used the clear shot more frequently, besides the lob and drop shots, and they tried to have a longer time for recovery.

APPLICATION IN SPORT

It can be said that the shot preferences in men's and women's badminton matches in Olympics, World, and European championship organizations, the training styles of trainers, and the competition plans would contribute to better exhibiting the current characteristics of badminton. Thus, for guiding the athletes, trainers, and researchers, who are interested in badminton, it can be stated that interpreting all the analyses we made for the top-level final matches would be very important for both explaining the information regarding the deep details of top-level badminton matches and using these interpretations in training planning.

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