

## TECHNICAL-TACTICAL ANALYSIS OF WRESTLING COMPETITIONS IN 2016 RIO OLYMPIC GAMES

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### ABSTRACT

*The aim of study was to analyze technical-tactical and scores of the free-style wrestling competitions at the Summer Olympic Games in Rio, Brazil in 2016. Video analysis of a total of 141 matches (n = 119 wrestlers) in 6 weight categories in 35 countries was conducted with the Dartfish Connect Plus 8.0 program. The technical points, winning types, applied techniques, distribution of points were examined according to weight categories and total. Independent Samples t-test and One Way ANOVA tests were used to compare the data. Bonferroni test was used in the binary comparisons. The results indicated that the average duration of the wrestling match was 319.2 ± 93.1 sec. It was determined that there was a statistical difference according to the match duration (F = 3.55). 33.6% of the technical points were 1 point, 61% were 2 point and 5.4% were 4 point. 666 points in the first and 640 points in the second period (p>0.05). In the wrestling matches, were found that the most applied techniques were back pass takedown n = 179, push to out n = 125, passive n = 82, leg tackle n = 77, gut wrench n = 72 and double leg tackle n = 26, respectively. As a result, in the XXXI. Summer Olympic Games in Rio, freestyle wrestling match durations were different according to the weight categories, the most achieved technical points were 2 point and the most winnings are achieved with points. It was determined that the most back pass takedown and push to out techniques. It can be said that the changes made in wrestling rules have positive effects in terms of wrestling attractiveness and dynamism.*

**Keywords:** Match analysis, Olympic games, performance, wrestling.

### 1. INTRODUCTION

Wrestling is one of the oldest and most popular Olympic sports in the world. However, the reasons such as the complexity of wrestling rules, the long duration of tournaments, the lack of dynamic wrestling matches and the inability to score too many points prevent the development of this sport and to decreased the spectator from wrestling halls in recently years (Tünnemann, 1998; García-Pallarés, López-Gullón, Muriel, Díaz, & Izquierdo, 2011; Tropin, 2013; Chaabene, Negra, Bouguezzi, Mkouer, Franchini, Julio, & Hachana, 2017). The International Olympic Committee (IOC) have been planned to remove some sports from the 2024 Olympic Games. Wrestling was one of these sports. However, thanks to the successful work done and the important determinations taken, the decision to continue wrestling came out. It can be said that the decision was made about the successful organization of the World Championship in Hungary in 2013 and here are the decisions about wrestling rules. After 2013, the World Wrestling Association (UWW), formerly known as FILA, has begun to implement radical changes in its wrestling rules. Observations and scientific studies show that these changes of rules bring attractiveness and dynamism to wrestling matches. The impact of the rule change has been examined in all major

international organizations (World, Europe, etc.) except the Olympic Games. In particular, the number of sportsmen in the Olympic Games will be 6 and the number of weight categories in the other championships will be 8, which will vary in the distribution of the athletes. It is thought that there may be some differences in terms of technical and tactical aspects of the wrestling match.

Wrestling coaches face to face a major challenge, such as adapting elite wrestlers to current rules. Altered rules also require changes in training methods. At the same time, elite wrestlers need to adapt to new rules in order to be successful in the international arena. For this reason, it is very important to analyze wrestling matches in terms of score and technique-tactical aspects. After such analyzes, it is expected that wrestling training methods will also develop and innovate. Coaches needs to know wrestlers' physical and technical-tactical performance well in order to prepare a good training program. In other words, the training program should be prepared according to the existing sport form (condition and performance) of the athlete. For this reason, as in many other sports, performance analysis is an integral part of a successful coaching process (Yoon, 2002; Podlivaev, 2010; Farwell, 2013; Baić, Karninčić, & Šprem, 2014).

Today's technological developments enable coaches to perform performance analysis with less cost, time and effort. Thanks to the latest developments in laptops, digital cameras, software designed for match analysis and smartphones, match analysis is made easier and less time consuming. Currently, the best way to evaluate the athlete's target performance is by video analysis of matches. The videos of the wrestling competitions in the 2016 Rio Olympic Games in our study were analyzed by the Dartfish Connect Plus 8.0 match analysis program. The aim of present study was to analyzed technical-tactical and scores of the free style wrestling competitions at the Summer Olympic Games in Rio, Brazil in 2016.

## **2. METHODS AND MATERIALS**

### **2.1 Subjects and Procedure**

One hundred nineteen (119) wrestlers participating in the 2016 Rio Olympic Games in free-style were participated in 6 weight categories (57 kg, n=20; 65 kg, n=21; 74 kg, n=20; 86 kg, n=19, 97 kg, n=19, 125 kg, n=20 from 35 different countries. A total of 141 matches were technical-tactical analyzed. Dartfish Connect Plus 8.0 match analysis program was used for analyzed wrestling matches. Videos of the matches were transferred to the Dartfish Connect Plus 8.0 match analysis program, "Tagging" module was designed according to the variables to be examined in present study. Two trained university student from Uludag University, Faculty of Sport Sciences analyze the matches in the analysis program. One of the students is a national wrestler who has wrestled for 12 years and the other is a student who is trained on computer programs. These two analysts made preparatory work before using the program with researchers. Analysis of video matches is completed within a month.

### **2.2 Statistical Analysis**

Numerical data of variables determined in Dartfish Connect Plus 8.0 program were analyzed after transferring them to SPSS for Windows 24 program. Independent Samples *t* and One Way ANOVA tests were used to compare the data obtained. Bonferroni test was used in the binary comparisons. The level of significance was accepted as  $p < 0.05$ .

### 3. RESULTS

The data obtained in the study are shown in Table 1-4. The technical points' distribution and the average wrestling match durations are shown in Table 1, the victory types are shown in Table 2, point distributions according match periods are shown in Table 3, the techniques applied in weight categories are shown in Table 4.

**Table 1: Technical point distributions and match durations according weight categories**

Weight Categories		1 point	2 point	4 point	Total	Match Duration Mean $\pm$ SD	F and Binary Comparison $p < 0.05$
57 kg	N	42	87	10	139	304.4 $\pm$ 105.5	F= 3.552
	%	30,2	62,6	7,2	100		
65 kg	N	60	73	7	140	335.9 $\pm$ 61.1	57-65*; 57-86*
	%	42,9	52,1	5,0	100		
74 kg	N	41	105	6	152	302.1 $\pm$ 127.2	57-97*, 65-74*
	%	27,0	69,1	3,9	100		
86 kg	N	33	56	6	95	336.8 $\pm$ 59.2	74-86*; 74-97*
	%	34,7	58,9	6,3	100		
97 kg	N	40	56	9	105	331.4 $\pm$ 78.1	65-125*; 86-125*
	%	38,1	53,3	8,6	100		
125 kg	N	32	74	2	108	307 $\pm$ 105.1	97-125*
	%	29,6	68,5	1,9	100		
<b>Total</b>	<b>N</b>	<b>248</b>	<b>451</b>	<b>40</b>	<b>739</b>	<b>319.2<math>\pm</math>93.1</b>	
	<b>%</b>	<b>33,6</b>	<b>61,0</b>	<b>5,4</b>	<b>100</b>		

\*There are statistically significant difference

The maximum duration of the matches were found to be 65 kg and 86 kg, and at least 57 kg. In the comparison of the match times 57 kg - 65 kg, 57 kg - 86 kg, 57 kg - 97 kg, 65 kg - 74 kg, 74 - 86 kg, 74 - 97 kg, 65-125kg, 86 kg -125 kg and 97 kg -125 kg ( $p < 0.05$ ), respectively. The maximum total technical score is 74 kg, at least 86 kg. Within the total of 739 technical points, 61% of the techniques applied to earning 2 points were determined.

**Table 2: Quality of bout results**

Weight Categories		IWD	Point	TS	Fall	Total
57 kg	N	0	14	8	2	24
	%	0,0%	58.4%	33.3%	8.3%	100,0%
65 kg	N	0	20	4	1	25
	%	0,0%	80%	16%	4%	100,0%
74 kg	N	1	16	6	0	23
	%	4.3%	69.6%	26.1%	0,0%	100,0%
86 kg	N	1	18	2	1	22
	%	4.5%	81.8%	9.1%	4.5%	100,0%
97 kg	N	1	17	4	1	23
	%	4.3%	73.9%	17.5%	4.3%	100,0%
125 kg	N	0	17	7	0	24
	%	0,0%	70.8%	29.2%	0,0%	100,0%
<b>Total</b>	<b>N</b>	<b>3</b>	<b>102</b>	<b>31</b>	<b>5</b>	<b>141</b>
	<b>%</b>	<b>2.2%</b>	<b>72.3%</b>	<b>22%</b>	<b>3.5%</b>	<b>100,0%</b>

IWD: Injury, Withdrawal, Default; TS: Technical Superiority

It was determined that the most victories were obtained by point (72.3%) and the least victories were obtained by IWD (3.5%). According the weight categories, the most victory by point in 86 kg (81.8%) and the most victory by TS in 57 kg (33.3%).

**Table 3: Point distributions according match periods**

Period	N	Sum of points	Mean	%	t
First	375	666	1.76	51.2	0.433
Second	359	640	1.78	48.1	
<b>Total</b>	<b>739</b>	<b>1306</b>	<b>1.77</b>	<b>100</b>	

There is not statistically significant difference between point distributions of first (666 point) and second (640 point) periods of bout ( $p>0.05$ ). The mean scores were 1.76 point and 1.78 point, respectively

**Table 4: Wrestling technique according weight categories**

Wrestling Techniques	57 kg		65 kg		74 kg		86 kg		97 kg		125 kg		TOTAL	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<i>SP</i>													479	64.5
Back Pass	34	19	32	17.9	49	27.4	20	11.2	27	15.1	17	9.4	179	37.3
Dropping from SP	10	62.5	1	6.25	1	6.25	1	6.25	2	12.5	1	6.25	16	3.3
Headlock	1	10	0	0	7	70	1	10	1	10	0	0	10	2.1
Hip Throw	2	50	1	25	0	0	0	0	1	25	0	0	4	0.8
Duble leg tackle	3	11.5	5	19.2	5	19.2	6	23.1	1	3.8	6	23.1	26	5.4
Frieman's lift	0	0	1	50	1	50	0	0	0	0	0	0	2	0.4
Push to out	19	15.2	34	27.2	25	20	17	13.6	20	16	10	8	125	26
Throw back	0	0	2	50	0	0	0	0	2	50	0	0	4	0.8
Suplex	0	0	0	0	2	50	2	50	0	0	0	0	4	0.8
Leg Tackle	7	9.1	13	16.9	14	18.2	9	11.7	11	14.3	23	29.9	77	16
Shoulder throw	0	0	1	33.3	0	0	0	0	2	66.7	0	0	3	0.6
Foot sweep	0	0	3	50	0	0	2	33.3	1	16.7	0	0	6	1.3
Heel tackle	1	4.3	5	21.7	4	17.4	7	30.5	2	8.7	4	17.4	23	4.8
<i>Parterre Position</i>													149	20
Ankle twist	10	34.5	3	10.3	8	27.6	0	0	4	13.8	4	13.8	29	19.4
Crotch Lift	0	0	1	33.3	0	0	0	0	0	0	2	66.7	3	2
Gut wrench	17	23.6	8	11.1	10	13.9	11	15.3	8	11.1	18	25	72	48.3
Crotch lift	4	40	1	10	5	50	0	0	0	0	0	0	10	6.7
Bring to danger position	12	34.2	7	20	7	20	3	8.6	3	8.6	3	8.6	35	23.4
<i>Other</i>													115	15.5
Reject challenge	6	23.1	6	23.1	7	26.9	2	7.7	4	15.4	1	3.8	26	22.6
Caution	3	42.8	2	28.6	0	0	0	0	2	28.6	0	0	7	6.1
Passive	11	13.4	15	18.3	8	9.8	15	18.3	14	17.1	19	23.2	82	71.3

SP: Standing Position

A total of 630 techniques were applied in standing position ( $n = 481$ , 64.5%) and parterre position ( $n = 149$ , 20%). Back pass (37.3%), Pushing to out (26%) and leg tackle (16%), were the most applied techniques in standing position of free style wrestling. The least applied techniques were fireman's lift (0.4%), shoulder throw (0.6%). Some of techniques are not applied in all weight categories. A total of 5 different techniques were applied in the parterre positions. Crotch lift was the most applied techniques in parterre position ( $n = 72$ , 48.3%). Reject challenge, caution and passive have been scored in 141 wrestling matches. Among them, the highest score was Passive 71.3 ( $n = 82$ ).

#### 4. DISCUSSION

The aim of present study was to analyzed technical-tactical and scores of the free style wrestling competitions at the Summer Olympic Games in Rio, Brazil in 2016. In present study was

hypothesized that after amendments of rules in 2013 wrestling the wrestling has become more dynamic and the techniques applied have increased qualitatively and quantitatively.

López-Gonzalez (2014) in recently study mentioned that wrestling activity in standing position increased significantly in comparison with 2012 Olympic Games. After 2012 Olympic Games wrestling in standing position again becomes more important in wrestling. Marković et al. (2017) compared freestyle wrestlers' competitive activity at the European competitions in 2013, 2014 and 2015. Researchers was found that after changes of rules the average number of actions and repertoire of applied techniques at the competition hasn't changed, that the attractive techniques are less used and that techniques that carry no significant risk for the attacker dominate. Number of points is significantly higher due to the higher scoring value of actions, and scoring intensity differences turned out to be insignificant due to longer duration of a fight. Number of realized actions per unit time has become even smaller, and the differences are on the verge of the statistical significance ( $p=0.052$ ). However, more frequent award of passivity contributed to the higher dynamism of this wrestling type (2). Tünnemann (1998) has noticed that the number of attractive throws, has been constantly decreasing since the Olympic Games in Barcelona in 1992, while the number of less attractive actions is constantly increasing. Results in present study have been shown that match durations during Olympic Games in Rio (2016 year) are more than 2013, 2014 and 2015 European competitions. In addition, winning by point and technical superiority was increased. Some previously studies (Tünnemann, 2011; López-González, Rodriguez, Barcenas, & Alonso, 2012; Tünnemann, 2016) have been investigate diversity wrestling techniques. In present study was found that diversity of wrestling techniques have been expanded.

## 5. CONCLUSION

As a result, in the XXXI. Summer Olympic Games in Rio, freestyle wrestling match durations were different according to the weight categories, the most achieved technical points were 2 point and the most winnings are achieved with points. It was determined that the most back pass takedown and push to out techniques were applied in all weight categories. It can be said that the changes made in wrestling rules from have positive effects in terms of wrestling attractiveness and dynamism.

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