

# Differences of Duration of the Fight Depending on the Stage of the Judo Competition

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**Abstract** The purpose of this study is to compare the time characteristics of introductory and final rounds of judo competitions. This study analyzed 656 male judo fights in National Championships of Uzbekistan which were held in 2018 and 2019. All competition rounds were divided as first and the second subsample. Results were processed at the level of descriptive statistics. Descriptive parameters were counted: Average Indicator (M), Standard Deviation (SD), Minimal (Min) and Maximal (Max) results. The normality of the distribution of findings was tested using the Kolmogorov-Smirnov test and the T-test for independent samples was applied. Data were processed using the IBM SPSS Statistics 20.00 statistical package. The research results show that judo fights last longer in the second phase of the competition. The difference in the duration of the judo fights is - 63.47 seconds, i.e. the fight in the second phase of the competition lasts significantly longer, about 1.03 minutes. The results indicate that in judo both anaerobic and aerobic exercises are essential to get high achieves. High endurance capacity plays a crucial role in last rounds of the competition. This investigation would help to improve competitive effectiveness judokas, results would be clear indication of how to energy expenditure in a various rounds of the competition. Time characteristics of each phases of the contests are directly connected with physiological bases of judo such as energy consumption, VO<sup>2</sup> intake and Blood Lactate concentrations of the athletes during the different rounds.

**Keywords** Judo, Competition Rounds, Time Durations, Training

## 1. Introduction

Over the last several decades, competitive activity of athletes played an important role in preparing system. Different scientific works were researched in many sports on this problem.

Judo is high-intensity sport in which during the contests various technical-tactical actions are used by the judo players. It consists of many actions and activities. These are considered non-linear actions and these factors influence the analyzing process [3,4]. Previous studies show that in judo contests different combat phases are identified such as time, motion, structure and others. According to the current IJF refereeing rules [8], the regular fight time consists 4 minutes for both male and female athletes. When the athletes fight equal in a regular period of the contest, the winner of the fight is identified according to Golden Score rule.

Research in this field has a long tradition. For decades, one of the most popular studies is that of analysis of judo competitions. In many scientific researches, judo combat activity was divided according to following phases: total fight time, standing fight time, displacement without contact or approach, gripping, technique, groundwork

combat and pause time [12]. The judo combat phases were analyzed as break, preparation, grip, technique, fall, and groundwork phases in other studies. The various time characteristics were identified for different combat phases. Research results showed that the combat phases are not similar for all weight, age and sex categories [9,13]. The studied literature showed that there are enough differences between the combat phase time in accordance to the specific bases of the athletes (example, age, weight, gender, qualification and others). Also, the small details of the combat phases can give more crucial information about the athletes and general competition trends. For these reasons, some researchers studied small details of the contests. Particular measuring criteria were proposed such as Activeness Index (AI), Effectiveness of Attack (EA), Counterattack Effectiveness Index (EC), Defensive Effectiveness Index (ED) [10] and Offensive Activeness Index (OA) [2]. Measuring processes according to these criteria were successfully used in practical work. The contest dynamic indicators of the champions and vice-champions were compared through these evaluating methods.

Some studies show that in judo home advantages are also play a crucial role in sporting results. The research results showed that association between the number of visiting and competing at home was significant only for male athletes [7]. Different results were observed by the scientists that among the male judokas only half-lightweight category athletes were significantly balanced competing to other weights. Also, it was noted that home advantage increases the probability of winning a single fight for both genders [11].

Our observations show that there are no previous studies which focused the time durations of judo fights by rounds. It is scientifically hypothesized in this paper that the time duration of the combats is not equal in previous rounds (I and IV rounds) comparing to last ones (quarter final fights and final fights). There were not studies that explored the time durations of fights using this approach. Mostly, research papers have focused the attention to analysis special combat phases of the full fight. While, in this current work we have aimed to compare full time durations of judo contests divided into two groups. This is a main novelty of the study. This factor influences to fighting style and athletic results in competition. Furthermore, time limits and durations of them in each round might be clear indication for coaches to plan aerobic and anaerobic training of the judokas. For this reason, this work focuses to compare durations of introductory and final rounds of judo competitions.

## 2. Methods

The sample. The sample in this research represents 656

judo fights, which were recorded at 2 senior National Championships of Uzbekistan, 2018 and 2019. The entire research sample was divided into two subsamples, in order to determine the differences in the duration of the fight time between the introductory and final phases of the competition. The competition rounds were divided as following subsamples:

- First subsample; 508 matches (include I, II, III and IV rounds).
- Second subsample; 148 matches (include quarter final, semifinal, repechages, bronze medal and final fights).

In order to equalize the subsamples, by applying systematic causation, based on the selection steps and tabular values of the first entity, the first subsample was randomly reduced from 508 matches to 148.

**Sample variables.** The research analyzed one variable that referred to the total duration of the judo fights (Time) including the duration of the regular part of the fight and the compensation of time (Golden Score).

**Research description.** The results of the research were collected on the basis of official minutes from the National Judo Championships of Uzbekistan for seniors, 2018 and 2019. Only male judokas were included in the results, while no analysis was performed for female judokas. Also, there was no division by weight categories, but the duration of judo fights for all 7 weight categories were analyzed together. In order to better and more accurately process the results, the duration of judo fights is expressed in seconds. The collection, entry and classification of results were collected by one of the authors of the paper, who is also a licensed judo referee of the JFUz (Judo Federation of Uzbekistan).

**Statistical processing.** All results were processed at the level of descriptive statistics, where the basic descriptive parameters were calculated: Mean (M), Standard Deviation (SD), Minimal (Min) and Maximal (Max) indicators. The Kolmogorov-Smirnov test (K-S) was used to calculate the normality of distribution of the results. Regarding to the obtained K-S test results, there were not identified the significant results in distribution of the taken results. The T-test was used for independent samples. Data were processed using the IBM SPSS Statistics 20.00 statistical package.

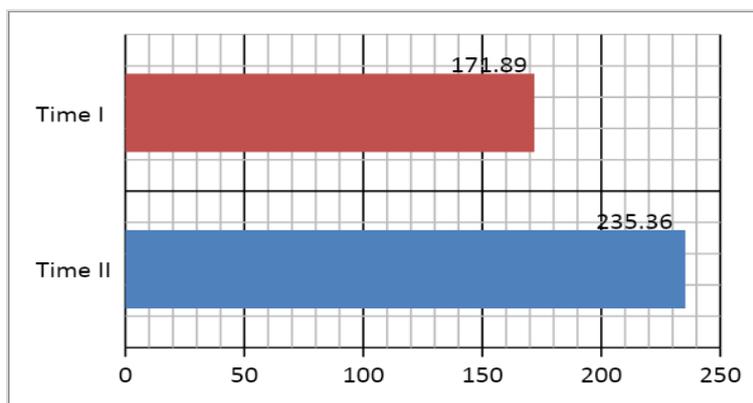
## 3. Results

By analyzing the obtained results of descriptive statistical parameters (Table 1) and graphical presentation of arithmetic mean values (Graph 1), it is obvious that judo fights last longer in the second phase of the competition (M - 171.89 vs 235.36). Results of the Kolmogorov Smirnov test showed that distribution of results was not statistically significantly disturbed in both subsamples (K-S - 0.11 vs 0.08).

**Table 1.** Descriptive statistic

Variable	N	M	SD	Min	Max	K-S
Time I	148	171.89	101.65	4.00	526.00	0.11
Time II	148	235.36	119.39	7.00	522.00	0.08

*Legend; N-sample; M-Mean; SD-Standard Deviation; Min-Minimal; Max-Maximal; K-S-Kolmogorov-Smirnov Test*

**Graph 1.** Graphical representation of arithmetic mean values**Table 2.** T test – Differences in duration of judo fights between subsamples

Levene's test for equality of variances		T-test for equality of means						
F	Sig.	t	df	Sig. (2-tailed)	Mean differences	Standard error difference	95% Confidence interval of the difference	
							lower	upper
0,55	0,45	-4,92	294	0,00	-63,47	12,88	-88,84	-38,10
		-4,92	286,70	0,00	-63,47	12,88	-88,84	-38,10

As shown table 2, the results of the T-test for independent samples were obtained different between the two samples. Analysis of the values in the table showed that Levene's test (F) is not at a statistically significant level (Sig. 0.45), which means that these are compatible subsamples and that the obtained T-test results can be properly analyzed. The value of the T-test (-4.92) is at a statistically significant level (Sig. 2-tailed 0.00) which means that statistically significant difference between the duration of two subsamples. In this case, the difference in the duration of the judo fights (Mean Difference) is - 63.47 seconds, i.e. the fight in the second phase of the competition lasts significantly longer, about 1.03 minutes.

#### 4. Discussion and Conclusion

The aim of this work was to compare time durations of introductory and final rounds of judo competitions. Our results suggest that this approach of measuring of time duration of judo combats is appropriate for identifying the fight time characteristics. There were observed statistically differences time durations between the two subsamples of

the rounds. The first and the second parts of the analyzed rounds lasted  $171.89 \pm 101.65$  s and  $235.36 \pm 119.39$  s., respectively. The mean differences between the samples were 63.47 s found. The second phase of the rounds which is quarterfinal, semifinal, repechage fights, bronze medal fights and final meets last longer than the first phase. Comparing the average time durations of contests to other studies, there were presented general results, but not on a round by round separately as we divided. It was identified that time durations were  $233 \pm 78.2$  s, for male and  $202.2 \pm 88.8$  s, for female athletes, respectively [14]. Despite this research, few scientists have studied the temporal structure of judo combats among elite judokas [12] but to our knowledge, none have studied the differences of time durations by rounds. Furthermore, no studies have examined the comparative analysis of time indication of rounds during the competition.

It is interesting to connect our study results with physiological bases of the judo fights. Franchini et.al., have confirmed that metabolically, judo turned out to be a mix of aerobic sports like running and anaerobic sports like weightlifting [5]. Also, other studies confirm that association between the aerobic power and lactate

concentration has negative correlation between the OBLA velocity and blood lactate after 15 minutes of the fights. The results confirm that high aerobic capability can affect to recovery strategy of the athletes [6]. It is noticeable to point that the aerobic power of the athletes is crucial in the long period fight durations. During the additional time (Golden Score), judokas need to perform high-intensity attack and actions. Because this factor directly influences to win or lose the fight.

It is clear from our results that in second part of the rounds (quarter final and final fights) the extra time was more occurred than the first part of the rounds. It is interesting to connect the time duration of rounds and fighting style of the athletes. It was suggested that offensive judo player style has higher anaerobic capacity than the defensive judokas which has better aerobic capacity [1]. Also, authors investigated the simulated Anaerobic Threshold (AT) with the most common lactate-based ATs in practice [15]. Researches established a new method to determine the AT by means of computer of computer science model named Performance Potential (PerPot). The analyzed literatures show that in judo there is need different approach to preparing system. Defensive judo athletes focus to develop both aerobic and anaerobic capabilities. Because they need good anaerobic metabolism during the judo fights to ATP resynthesis.

Using this approach to analysis of judo combats have been identified time limits and differences between the rounds which is first and second subsamples. After fourth rounds, fight time durations last more than the previous rounds. Our results indicate that in judo both anaerobic and aerobic exercises are crucial to get high achieves. Also, in last rounds of the full match, the high endurance capacity plays a crucial role. This investigation would help to improve competitive capability of judo athletes. Additionally, these findings would be clear indication of how to energy consumption in a various rounds of the competition. Time characteristic of each phases of the match is directly connected with physiological bases of judo such as energy consumption, VO<sub>2</sub> intake and Blood Lactate concentrations of the athletes during the different rounds. Furthermore, judo coaches should focus time duration of each subsample that it is directly connected with the athletic capacity. According to those time limitations of the competition, they can improve their judokas' fitness preparedness.

## REFERENCES

- [1] Azevedo, P., Olivera, J. C., Zagatto, A., Rereira, P. E., & Perez, S. E. A. "Aerobic and anaerobic threshold determined by specific tests in judo is not corrected with general test", *Sport Sciences for Health*, 2018, DOI: 10.1007/s11332-018-0454-1.
- [2] Boguszewski D, "Offensive activity as an element of the evaluation of struggle dynamics of judo contests", *Archives of Budo*, vol. 10, pp. 101-106, 2014.
- [3] Franchini E, Sterkowicz S, Meira J. C. M., Gomes F. R. F, Tani G, "Technical variation in a sample of high level judo players", *Perceptual and Motor skills*, vol. 106, pp. 859-869, 2008.
- [4] Franchini E, Bertuzzi R. C. M, Takito M. Y, Kiss M, "Effects of recovery type after judo match on blood lactate and performance in specific and nonspecific judo tasks. *European Journal of Applied Physiology*, vol. 107, pp. 377-383, 2009.
- [5] Franchini E, Giannini Artioli G, Brito J, "Judo combat: time-motion analysis and physiology", *International Journal of Performance analysis in Sport*, vol. 13, pp. 624-641, 2013.
- [6] Franchini E, Miarka B, Matheus L, Del Vecchio F. B, "Endurance in judogi grip strength tests: comparison between elite and non-elite judo players", *Archives of Budo*, vol. 7, pp. 1-4, 2010.
- [7] Julio, U.F., Panissa, V. L.G., Miarka, B., Takito, M.Y., & Franchini, E. Home advantage in judo: A study of the world ranking list. *Journal of Sports Sciences*, 31, 212-218, 2013.
- [8] International Judo Federation. [www.ijf.org](http://www.ijf.org). Explanatory guide to the refereeing rules, 9 March 2018 Published. 1547390614 pdf.
- [9] Katarzyana Sterkowicz-Przybycien, Miarka B, Fukuda D, "Sex and Weight Category Differences in Time-Motion Analysis of Elite Judo Athletes: Implication for Assessment and Training", *Journal of Strength and Conditioning Research*, vol. 31 (3), pp. 817-825, 2016.
- [10] Kalina R.M, "Teoria sportcow walki", COS Warszawa, 2000 [in Polish].
- [11] Krumer, A. On Winning Probabilities, Weight Categories, and Home Advantage in Professional Judo. *Journal of Sport Economics*. 18(1), 77-96, 2017.
- [12] Miarka B, Panissa V. L, Julio, U. F, Del Vecchio, F. B, Calmet, M, Franchini E, "A comparison of time-motion performance between age groups in judo matches", *Journal of Sport Sciences*, vol. 30, pp. 899-905, 2012.
- [13] Miarka B, Cury R, Julianetti R, Battazza R, Julio U. F, Calmet M, Franchini E, "A comparison of time-motion and technical-tactical variables between age groups of female judo matches", *Journal of Sport Sciences*, vol. 32, pp. 1529-1538, 2014.
- [14] Soranigo D, Iruiria A, Tarrago R, Tayot P, Mila-Villaroel R, Iglesias X, "Time-motion analysis during the elite judo combats (defragmenting the grip time)", *Archives of Budo*, vol. 15, pp. 33-45, 2015.
- [15] Stefan E, Sabine H, Björn S, Perikles S, Mark P, "The PerPot Simulated Anaerobic Threshold - A Comparison to Typical Lactate-based Thresholds", *International Journal of Human Movement and Sports Sciences*, 5(1), 9 – 15, 2017. DOI: 10.13189/saj.2017.050102.