

# Analysis of the frequency and effectiveness of the technical actions used in the 2021 European Judo Championship according to the elapsed time of combat

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## ABSTRACT

The interpretation of temporal parameters during competitive practice is always interesting and pertinent, and specifically in judo, which requires high preparation from athletes to be able to control or throw the opponent in a short space of time. The interest of this study perspective, which allows us to interpret competitive action in more detail, is also important to reflect that according to the legal adaptations dictated by the rules of a modality, it makes its study necessary. The objective was to analyse the frequency and effectiveness of technical actions used in the 2021 European Judo Championship depending on the elapsed time of combat. The study sample focused on 400 combats of the European Judo Championship 2021, with 6731 technical actions in combat being categorized. We used an observation system created for this purpose, according to the classification system proposed by Kodokan. Cross-frequency tables were produced, where the association degree between variables was analysed using the Chi Square test, where the significance level was set at  $p \leq .05$ . We complemented the association analysis between variables by calculating the adjusted standardized residuals. The number of technical actions tends to decrease over the 1st to 4th minute of combat and consequently also towards the golden score time. The relative percentage of technical actions scored from the 1st to the 4th minute of combat tends to increase, with the Ippon advantage assuming an increasing percentage trend and the Waza-ari advantage a decreasing trend, maintaining this trend in golden score.

**Keywords:** Judo, Kodokan, European Championship, Combat performance, Competitive performance analysis.

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## INTRODUCTION

Judo is an Olympic combat sport divided into male and female weight categories. Each weight category implies marked differences in technical and strategic dimensions (Franchini and Herrera-Valenzuela, 2017). Currently, a judo fight can last from a few seconds to more than 12 minutes, depending on the score obtained by the competitors. However, a high-level judo fight tends to last 3 minutes, with periods of activity of 20 to 30 seconds and 5 to 10 seconds of interruption. It is noted that a significant part of the fights last 3 to 4 minutes (Franchini and Herrera-Valenzuela, 2017). It's important and necessary to interpret the competitive action in more detail on the different phase of the combat time, and it is also important to reflect that according to the legal adaptations dictated by the rules of the sport (Batista et al, 2022). The objective was to analyse the frequency and effectiveness of technical actions used in the 2021 European Judo Championship depending on the elapsed time of combat.

## MATERIAL AND METHODS

### **Participants**

The study sample focused on the European Judo Championship 2021, which had the participation of 359 athletes registered, 210 male athletes, and 149 female athletes, from 45 countries. 400 judo combats were observed, in the different male and female weight categories, with 6731 technical actions in combat being categorized.

### **Measures**

We used an observation system created for this purpose, allowing registration and categorization of each technical action observed in combat, according to the following variables described. Each technique was categorized according to the classification system proposed by Kodokan. Data analysis was performed to identify each technique serving five categorization classes for Nage-Waza, also used by other authors (Boguszewski, 2016).

### **Procedures**

For this research preparation, no ethical issues involved in the analysis and interpretation of the data used were considered, since they were obtained using publicly available and freely accessible International Judo Federation (IJF) online sources and were not generated by any experimentation process. The athletes' personal identification was not done since the observation was not individualized. The identification of each observed combat was replaced by a code, which guaranteed anonymity and confidentiality.

### **Analysis**

The techniques count distribution frequency was compared using the software IBM SPSS 21.0 software. For this purpose, cross-frequency tables were produced, where the association degree between variables was analysed using the Chi Square test, where the significance level was set at  $p \leq .05$ . We complemented the association analysis between variables by calculating the adjusted standardized residuals, taking as reference positive values equal to or greater than 1.96, assuming that the higher the residual, the more significant the trend is (Marôco, 2018).

## RESULTS

The results revealed for combat time min = 36", max = 676.8", M = 239.4", DP = 98.4", which gives an average of 4.25 technical actions per minute. In the data in Table 1, we observed in both sexes that the

number of technical actions tends to decrease throughout the 1st to the 4th minute of combat and consequently also for the golden score time. In turn, the relative percentage of technical actions scored from the 1st to the 4th minute of combat tends to increase, with the Ippon advantages assuming an increasing percentage trend and the Waza-ari advantage a decreasing trend. In the golden score phase, Ippon's advantage is also higher than Waza-ari, a phenomenon registered in both genders, with a higher relative percentage of effectiveness in females. There were also significant associations with the Ippon advantage in the 4th minute and golden score in both genders.

Table 1. Predominance of technical and effectiveness actions during to the elapsed time of combat.

	Advantage	Male Group / Combat Time					GS
		Total	1º m	2º m	3º m	4º m	
M a l e	Ippon	176	17	34	48	48*	29*
	%	4.84%	1.9%	3.7%	5.7%	9.0%	6.52%
	Waza-ari	128	29	36	31	17	15
	%	3.52%	3.2%	3.9%	3.7%	3.2%	3.37%
	Non Score	3332	855	848	757	471	401
	%	91.64%	94.9%	92.4%	90.6%	87.7%	90.11%
	Total	3636	901	918	836	536	445
	Advantage	Female Group/Combat Time					GS
		Total	1º m	2º m	3º m	4º m	
F e m a l e	Ippon	128	18	30	29	28*	23*
	%	4.14%	2.1%	3.8%	4.7%	6.3%	6.13%
	Waza-ari	92	27	22	16	11	16
	%	2.97%	3.1%	2.8%	2.6%	2.5%	4.27%
	Non Score	2875	821*	736	574	408	336
	%	92.89%	94.7%	93.4%	92.7%	91.3%	89.6%
	Total	3095	866	788	619	447	375

Note. \* (technical group shows a significant residue).

## DISCUSSION

When analysing the results, we observed that the percentages of effectiveness follow a trend identical to that already found by Batista et al. (2022), Boguszewski (2016). The average value of combat time (M = 239.4”), although general for both genders, falls within the average values published by Barreto et al. (2022 in Batista et al., 2022) in their review and meta-analysis (combat time for men's judo in international competitions between 2010 and 2019), where they observed that the average combat time for men's judo decreased after each rule change (2010, 2013, 2017 and 2018). The same authors also recorded significant differences between fights that ended within the regular time and those that required extra time (gold score: 2013 = 3% vs. 2018–2019 = 21%).

## CONCLUSIONS

The number of technical actions tends to decrease over the 1st to 4th minute of combat and consequently also towards the golden score time. The relative percentage of technical actions scored from the 1st to the 4th minute of combat tends to increase, with the Ippon advantage assuming an increasing percentage trend and the Waza-ari advantage a decreasing trend, maintaining this trend in golden score.

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