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## Ways of settling a judo fight at consecutive stages of sports competitions

Marek Adam

*Department of Martial Arts, Gdansk University of Physical Education and Sport in Gdansk, Poland,  
marek.adam@awf.gda.pl*

Beata Wolska

*Department of Martial Arts, Gdansk University of Physical Education and Sport in Gdansk, Poland*

Sergey Tabakov

*Russian State University of Physical Education, Sports and Tourism, Moscow, Russia*

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## Ways of settling a judo fight at consecutive stages of sports competitions

### Abstract

**Background:** At successive stages of sports competition, judo contestants aim at achieving the best sports result. Each fight can be resolved by an effectively executed attack before the regular time (ippon or double waza-ari) or by a better score for efficient attacks (waza-ari or yuko). The victory can also be achieved for penalties awarded to the opponent (shido) or when he/she is disqualified for infractions of the sports rules of the International Judo Federation. **Material/Methods:** The research material was based on the analysis of bouts fought by male competitors during the World Championships in 2014 and 2015. **Results:** The results of the conducted analysis allow concluding that at subsequent stages of sports competition the number of fights decided by efficiently executed techniques evaluated as ippon or double waza-ari decreased, just as the number of fights won through the opponent's disqualification. On the other hand, the number of decisions based on a better score for efficient attacks and the number of fights in which athletes won due to penalties given to their opponents increased. **Conclusions:** At all the analysed stages of competitions, one quarter of the bouts was decided by penalties which were a consequence of committed infractions.

### Keywords

penalties and efficient attacks, preliminary rounds and fights for medals, types of victories, judo

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# Ways of settling a judo fight at consecutive stages of sports competitions

## Authors' Contribution:

**A** Study Design  
**B** Data Collection  
**C** Statistical Analysis  
**D** Data Interpretation  
**E** Manuscript Preparation  
**F** Literature Search  
**G** Funds Collection

Marek Adam<sup>1</sup> ABCDEFG, Beata Wolska<sup>1</sup> CDEFG, Sergey Tabakov<sup>2</sup> AE

<sup>1</sup> Department of Martial Arts,  
Gdansk University of Physical Education and Sport in Gdansk, Poland

<sup>2</sup> Russian State University of Physical Education, Sports and Tourism, Moscow, Russia

## abstract

**Background:** At successive stages of sports competition, judo contestants aim at achieving the best sports result. Each fight can be resolved by an effectively executed attack before the regular time (*ippon* or *double waza-ari*) or by a better score for efficient attacks (*waza-ari* or *yuko*). The victory can also be achieved for penalties awarded to the opponent (*shido*) or when he/she is disqualified for infractions of the sports rules of the International Judo Federation.

**Material/Methods:** The research material was based on the analysis of bouts fought by male competitors during the World Championships in 2014 and 2015.

**Results:** The results of the conducted analysis allow concluding that at subsequent stages of sports competition the number of fights decided by efficiently executed techniques evaluated as *ippon* or double *waza-ari* decreased, just as the number of fights won through the opponent's disqualification. On the other hand, the number of decisions based on a better score for efficient attacks and the number of fights in which athletes won due to penalties given to their opponents increased.

**Conclusions:** At all the analysed stages of competitions, one quarter of the bouts was decided by penalties which were a consequence of committed infractions.

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**Corresponding author:** Beata Wolska Ph.D., Gdańsk University of Physical Education and Sport, Górskiego Street 1, 80-336 Gdańsk, Poland; e-mail: [beata.wolska@wp.pl](mailto:beata.wolska@wp.pl); phone: +48585547289

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## INTRODUCTION

The system of conducting world championships introduced in 2009, with the so-called “short repêchage”, did not change during the World Championships in 2014 and 2015 [1]. The successive stages of preliminary rounds led to selecting eight contestants who, fighting for a place in quarterfinals, ensured a possibility to compete for a medal as, even after losing the quarterfinal bout, they could compete for the bronze medal in the repêchage. By beating successive opponents, judo contestants get closer to winning the first place in sports competitions. Each next stage reduces the number of contenders for the final success, eliminating weaker athletes and saving those who could beat next opponents. The bouts could be resolved before the regular time by an efficient execution of one of the judo techniques scored as *ippon* or twice as *waza-ari*. They can also be settled by a better score if they are decided by technical attacks. But the outcome of a fight can also be decided by penalties awarded by judges. They can penalise a contestant by giving him three consecutive warnings during a fight – *shido* 1, 2 and 3 for infractions of the sports rules of the International Judo Federation. Another opportunity to win a fight before the end of the regular time is the opponent’s disqualification – *hansoku make*, which is a consequence of committing an offense assessed by the judge with the shido penalty for the fourth time or immediate disqualification (*hansoku make*) for executing techniques that threaten the contestants’ health or life or for using prohibited techniques, such as grappling contestants’ legs during throws.

Sports competitions of the highest rank, such as the Olympic Games or the World Championships, during which the best athletes compete with each other, are the ultimate test of the efficiency of judo contestants’ technical-tactical preparation. Observations of sports competitions in judo have been conducted for many years. Thus the obtained material allows developing, among others, individual technical-tactical profiles of Olympic medal winners [2, 3], characteristics of the judo combat and factors affecting the result of a sports fight with consideration for particular weight categories [4], determining the technical profile of *nage-waza* in a group of athletes at different sports levels [5] or defining and determining the efficiency of defensive actions applied in judo fighting [6].

In the present authors’ opinion, also of importance is the issue related to finding out the ways of resolving judo fights at successive stages of sports competitions, which is the aim of this study.

## MATERIAL AND METHODS

The research material was based on the analysis of 845 bouts fought by male competitors during the World Championships in 2014 and 2015.

The compiled footage was subject to graphic registration [7]. During the competitions, contestants’ efficiently executed attacks and penalties awarded by judges supervising all the bouts were recorded. The successive stages of sports competition have been divided in the following way:

- 1<sup>st</sup> stage – preliminary stage, fights for positions up to 64 and up to 32,
- 2<sup>nd</sup> stage – preliminary stage, fights for positions from 32 to 16; a fight lost at the first and the second preliminary stage meant elimination from the competition,

- 3<sup>rd</sup> stage – stage of fights in “the medal zone”, a victory in which gave a chance of a direct fight for a medal, and a failure gave another chance for repêchage,
- 4<sup>th</sup> stage – a direct fight for medals.

At each stage of elimination, a competitor could settle the bout as follows:

1. finish the fight by using a technique assessed as *ippon* or double *waza-ari*,
2. finish the fight by technical advantage, efficient execution of a technique assessed as *waza-ari* or *yuko*,
3. by warnings (*shido* 1, 2, 3) given to the opponent for infractions of the sports rules of the IJF,
4. by disqualification (*hansoku make*) of the opponent, a warning (*shido*) repeated for the fourth time in a fight or “immediate” disqualification resulting from the IJF rules [1].

Statistical analysis was conducted using the statistical package StatSoft. Inc. (2014) STATISTICA (data analysis software system), version 12.0. Chi-square independence tests were used for qualitative variables (using Yates’s correction for the number of cells below 10, verifying Cochran’s conditions, Fisher’s exact test, as appropriate). In all the calculations, the level of  $p < 0.05$  was adopted as significant.

## RESULTS

While competing at the first preliminary stage, contestants most frequently settled the bouts by performing techniques assessed as *ippon* or double *waza-ari* (60.5%), then through a technical attack (20.5%), followed by *hansoku make* disqualification (10.1%) and *shido* warnings (8.9%) (Table 1).

**Table 1.** Ways of settling judo bouts at successive stages of competition during the World Championships in 2014 and 2015

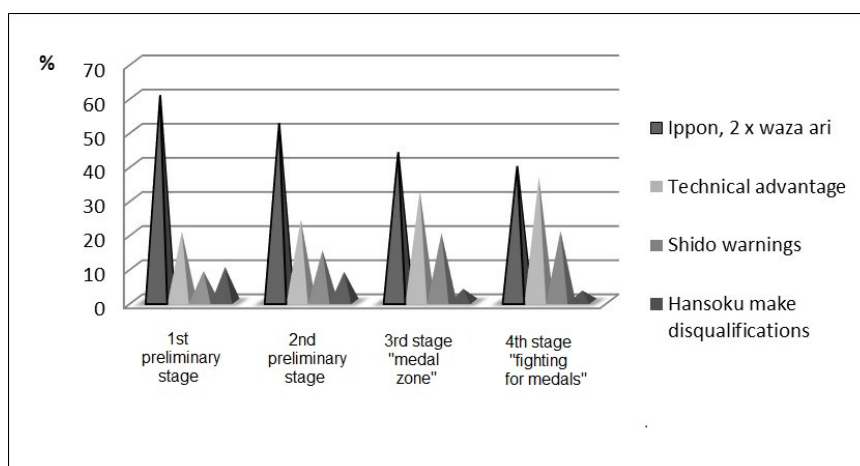
Stage of the competition		1st preliminary stage	2nd preliminary stage	3rd preliminary stage (medal zone)	4th stage fighting directly for medals
Settling bouts	<i>Ippon</i> + 2x <i>waza-ari</i>	210 (60.5%)	168 (52.3%)	35 (43.8%)	25 (39.7%)
	Technical advantage	71 (20.5%)	77 (24.0%)	26 (32.5%)	23 (36.5%)
	<i>Shido</i> warnings	31 (8.9%)	48 (15.0%)	16 (20.0%)	13 (20.6%)
	<i>Hansoku make</i> disqualifications	35 (10.1%)	28 (8.7%)	3 (3.7%)	2 (3.2%)
	Total	347 (100%)	321 (100%)	80 (100%)	63 (100%)

Also at the second preliminary stage, fights won before the end of the regular time accounted for over half of the results (52.3%), but the number of fights won by technical advantage in the score increased (24.0%), just as the number of victories due to judges’ warnings (15.0%). The number of fights decided by disqualification slightly decreased (8.7%) (Table 1).

At the third stage of fighting, defined as the “medal zone”, the number of bouts resolved before the end of the regular time (by *ippon*, or double *waza-ari*) decreased to 43.8%, and the number of fights decided by advantage in the

decreased to 43.8%, and the number of fights decided by advantage in the score increased to 32.5%, and of those resolved due to awarded penalties to 20.0%. At this stage of the competition, the number of fights won through disqualification was reduced by over a half – 3.7% (Table 1).

An analysis of the final stage of the competition at the World Championships in 2014 and 2015 – the fourth stage (direct fighting for medals and the final bouts) – confirmed a slight decline in the number of bouts won before the end of the regular time – to 39.7% and a slight increase in the number of victories by technical score – 36.5% as well as the steady trend in fights won due to warnings (20.6%) and disqualifications (3.2%) (Fig. 1, Table 1).



**Fig. 1.** Ways of resolving judo fights at successive stages of competition during the World Championship in 2014 and 2015

In the process of winning the successive stages of competition for the title of the World Champion in 2014 and 2015, judo contestants eliminated athletes who failed to win consecutive fights. In the analysed competitions, we found a progressive reduction in the number of fights resolved by technical attacks and those won before the end of the regular time – attacks assessed as *ippon* or double *waza-ari* (Table 2). The greatest decrease in the obtained values was found between the first and second preliminary stage and between the second and the third stage of elimination.

**Table 2.** Ways of settling judo bouts at successive stages of competition during the World Championships in 2014 and 2015

Stage of the competition		Between stage 1-2	Between stage 2-3	Between stage 3-4
Resolving fights	<i>Ippon</i> + 2x <i>waza-ari</i>	- 8.2%	- 8.5%	- 4.1%
	Technical advantage	+ 4.0%	+ 8.5%	+ 4.0%
	<i>Shido</i> warnings	+ 6.1%	+ 8.5%	+ 0.6%
	<i>Hansoku make</i> disqualifications	- 1.4%	- 5.0%	- 0.5%

Between the third and the fourth stage of competition the difference in the number of fights settled before the end of the regular time through a technical

attack was less than half (Table 2). The number of fights decided by the technical score, *waza-ari* or *yuko*, in the successive stages of the analysed World Championships retained the growing trend. The biggest increase in fights won in this way was found between the second and the third stage. By contrast, an even increase in fights won by technical score for efficient attacks was found between the first and the second stage and between the third and the fourth stage of competition (Table 2).

In addition, the number of bouts which were resolved in subsequent stages of elimination by judges' warnings – *shido* – also showed a growing trend; namely, the biggest increase in thus resolved fights was between the first and the second stage of elimination and between the second and the third one. Only a slight increase in such victories was found between the third and the fourth stage (Table 2). Fights resolved by contestants' disqualification – *hansoku make* – maintained a downward trend during subsequent stages of sports competition. The biggest decline in so finished fights was between the second and the third stage of competition, while the smallest decrease was between the third and the fourth stage (Table 2).

At the 1st stage the percentage of fights which ended in victory before the regular time (*ippon* or *2x waza-ari*) was significantly higher in comparison to the 2nd stage ( $p = 0.0330$ ), the 3rd stage ( $p = 0.0063$ ) and the 4th stage – fighting directly for medals ( $p = 0.0021$ ). On the other hand, no statistically significant differences were found in the percentage of bouts which ended in a victory before the regular time (*ippon* or *2x waza-ari*) at the 2nd stage in comparison to the 3rd stage ( $p = 0.1693$ ) and the 4th stage ( $p = 0.0663$ ). Furthermore, there were no statistically significant differences in the percentage of fights which ended with a victory before the regular time (*ippon* or *2x waza-ari*) at stage 3 in comparison to stage 4 ( $p = 0.6246$ ).

No statistically significant differences were found in the percentage of bouts which ended in disqualification (*hansoku make*) at stage 1 in comparison to stage 2 ( $p = 0.2729$ ). By contrast, at stage 1 the percentage of fights that ended in disqualification (*hansoku make*) was significantly higher in comparison to stage 3 ( $p = 0.0205$ ) and stage 4 ( $p = 0.0053$ ). Statistically significant differences in the percentage of fights that ended in disqualification (*hansoku make*) were not found at stage 2 in comparison to stage 3 ( $p = 0.1190$ ), while the percentage of bouts which ended in disqualification (*hansoku make*) at stage 2 was significantly higher in comparison to stage 4 ( $p = 0.0384$ ). No statistically significant differences in the percentage of bouts that ended in disqualification (*hansoku make*) were found at stage 3 in comparison to stage 4 ( $p = 0.6161$ ).

At stage 1 the percentage of fights won due to warnings (*shido*) was significantly lower in comparison to stage 2 ( $p = 0.0161$ ), stage 3 ( $p = 0.0044$ ) and stage 4 ( $p = 0.0058$ ). By contrast, there were no statistically significant differences in the percentage of bouts won by warnings (*shido*) at stage 2 as compared to stage 3 ( $p = 0.2701$ ) and as compared to stage 4 ( $p = 0.2593$ ). In addition, there were no statistically significant differences in the percentage of bouts won by warnings (*shido*) at stage 3 in comparison to stage 4 ( $p = 0.9253$ ).



No statistically significant differences in the percentage of fights won by an advantage in the score were found at the 1st stage in comparison to the 2nd stage ( $p = 0.5468$ ), the 3rd stage ( $p = 0.0728$ ) and the 4th stage ( $p = 0.0782$ ). No statistically significant differences in the percentage of bouts won by an advantage in the score were found between the 2nd stage as compared to the 3rd stage ( $p = 0.1362$ ) and the 4th one ( $p = 0.1336$ ). No statistically significant differences in the percentage of fights won by an advantage in the score point were found between stage 3 and stage 4 ( $p = 0.8525$ ).

**Table 3.** Resolving judo fights at successive stages of elimination during the World Championship

Stage of the competition		1st stage, 2nd stage	3rd stage, 4th stage
Resolving fights	<i>Ippon</i> + 2x <i>waza-ari</i>	56.6%	42.0%
	Technical advantage	22.2%	34.3%
	<i>Shido</i> warnings	11.8%	20.3%
	<i>Hansoku make</i> disqualifications	9.4%	3.5%

In the combined stages 1 and 2 the percentage of bouts which ended in victory before the regular time (*ippon* or 2x *waza-ari*) was significantly higher in comparison to the combined stages 3 and 4 ( $p = 0.0014$ ). In the combined stages 1 and 2 the percentage of bouts won due to a score advantage was significantly lower in comparison to the combined stages 3 and 4 ( $p = 0.0022$ ). In the combined stages 1 and 2 the percentage of bouts won due to warnings (*shido*) was significantly lower in comparison to the combined stages 3 and 4 ( $p = 0.0069$ ). In the combined stages 1 and 2 the percentage of bouts won due to disqualification (*hansoku make*) was significantly higher in comparison to the combined stages 3 and 4 ( $p = 0.0201$ ).

## DISCUSSION

Over seventy national teams participated in the World Championships both in 2014 and in 2015 in the men's competition. The number of contestants in various weight categories necessitated preliminary rounds of fights in order to qualify for a group of 64 or 32 athletes were bouts from the first preliminary round of fights analysed in this paper, in which the largest number of fights ended before the regular time (*ippon*) through efficient execution of one of judo techniques. At the next stages of competition, the percentage advantage of the number of victories due to efficient techniques (75%) over the fights won due to warnings and disqualifications (25%) remained constant, despite the fact that previous studies had found penalties less significant (20%) in determining the achieved successes [9].

Segedi et al. [10], analysing the results of seniors' bouts at a Grand Prix tournament, found that the vast majority of the fights ended in victory by the *ippon* score (79), then by *waza-ari* (16), and *yuko* (13), and in 16 bouts the victory was decided by the awarded penalties. The semi-final and the final bouts were not analysed. In turn, the results of Boguszewski's research [11], in which only the final bouts of the Olympic Games in Beijing (2008), the World Championships (Cairo 2005, Rotterdam, 2009) Grand Slam in Paris (2010), the World Cup Tournaments in Warsaw (2005 and 2009) were analysed, showed that in 2005 and 2009 over 50% of the final bouts ended by *ippon* while in 2010 less – 43%.



The results of observations of all the bouts fought during the Olympic Games in 2008 showed that 46.53% of fights ended by *ippon*, 4.95% by double *waza-ari*, 25.41% by technical advantage and 0.33% by awarding the penalty of disqualification, *hansoku make*. It should be noted that during this competition before changing the judging rules (before 2009), the *koka* scoring system was still binding, by which 3.3% of the bouts were resolved [4].

An analysis of the proportion of the results of bouts at various stages of the World Championships in Osaka (2003) showed that in all phases of the tournament scores of 0:10 points dominated, which means victory before time thanks to the execution of an attack assessed by the judges as *ippon* [12]. Over 70% of the victories before time were observed at the stage of repêchage bouts, less often in qualifying bouts (62.1%), and fights for medals (57.6%).

The authors also demonstrated that the victories by the advantage in the score (*yuko*) were more frequent in fights for medals and in repêchage bouts – less frequent in preliminary rounds, while confrontations resolved by 7-point advantage most often occurred in the last phase of the tournament. It should be noted that the above analysis was conducted before the change to judicial regulations, which has been in force since 2009 and in which the system of conducting the World Championships with a “shortened repêchage” has been applied.

## CONCLUSIONS

At subsequent stages of competition a trend of declining numbers of bouts resolved before the end of the regular time (by *ippon* or double *waza-ari*) and of bouts resolved by disqualification (*hansoku make*) was found.

Simultaneously, at successive stages of competition there was a growth of the number of bouts settled by warnings (*shido*) and technical scores.

At all stages of competition an advantage of fights settled through efficient attacks over fights resolved due to warnings and disqualifications was found.

The results of the conducted analyses are associated to a large extent also with the fact that at the initial stage of competition (qualification rounds) the highest ranked athletes in the particular weight categories fight with lower ranked athletes. At subsequent stages of the competition (semi-finals and finals), athletes with an increasingly higher level of sports mastery meet. This is reflected in the research results that have shown a reduction in the percentage of victories before time and an increase in the percentage of victories by technical advantage or penalties (*shido*). The results of the present study should be taken into account in the practical modeling as well as in correcting judo competitors' training process.

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