

# The diagnosis of the technical-tactical preparation of judo competitors during the World Championships (2009 and 2010) in the light of the new judo sport rules

## Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Manuscript Preparation
- E** Funds Collection

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## Abstract

### Background:

Very important changes in judo sport combat regulations were introduced in 2009–2010. The purpose of those changes was to make judo combat more attractive and to eliminate or reduce the techniques which do not derive from the accepted classification of judo techniques (grasping opponent's legs). The aim of our research was to determine the impact of the new judo rules on the effectiveness of techniques and the results achieved by men's national judo teams.

### Material/Methods:

The material comprised 811 judo men's contests documented by audio-video recorder during the World Championships in Rotterdam (2009), and the World Championships in Tokyo (2010). The fights were described using the graphic method of registration. The most effective teams were determined taking into account medals won and places taken in particular weight categories whereas predominant techniques were described by means of the technical-tactical preparation indices.

### Results:

Based on the championships results it was determined that during the 2009 World Championships the most effective teams were as follows: Korea, Russia and Ukraine. The predominant throwing techniques were *seoi nage*, *kuchiki taoshi* and *kosoto gari*, and the hand throws group was the most effective. During the 2010 World Champs the order of teams was as follows: Japan, France, Uzbekistan. *Seoi nage*, *uchimata*, *osoto gari* were the most often executed throws; and the leg throws were the most effectively performed.

### Conclusions:

Diminishing the effectiveness of hand throws (during World Champs 2010): *kuchiki taoshi* and *sukui nage* and increase in the effectiveness of leg techniques: *kouchi gari*, *uchimata*, *osoto gari* was close with increase of Japan's performance (men's group). Our findings will serve as basis for improving training programmes for judo competitors.

### Key words:

judo • provisions of judo • contest regulations • effectiveness of training • effectiveness of judo techniques

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## BACKGROUND

The need for changes that will make judo contest more attractive has been discussed for many years in judo spheres. A fight with competitors strongly leaned forwards and continually grasping each other's legs or trousers was not an attractive view. It has resulted in some changes in judo contest regulations and organization of competitions. In 2009 *koka*, the lowest score, was

removed and world championships were established to be held every year (previously, from 1965 to 2009, world championships were held every two years). In 2010 there was a change of the fight rules and some throws where opponent's legs were directly grasped like in: *morote gari*, *kuchiki taoshi*, *kibisu gaeshi* were limited now these throws are only allowed in combinations or as counterattack forms (<http://www.ijf.org>). Shorter time of a repechage contest, two competitors from one

**Judo** – gentle way.

**Effectiveness** – means the capability of producing an effect, and it is most frequently used in connection with the degree to which something is capable of producing a specific, desired effect.

**Judo techniques** – a set of various techniques used in judo sport combat. They have been classified by Kano Jigoro and divided into three main groups: throws, grapplings and assaulting vital points on a human body.

country in each weight categories, and location of competitors according to ranking lists all also greatly affected the rules of sport competition (<http://www.ijf.org> and <http://www.eju.net>).

Recent studies have showed that super elite judokas used a greater number of throwing techniques which resulted in scores, even when expressed relatively to the total number of matches performed, and these techniques were applied in more directions than those of elite judokas. Additionally the number of different throwing techniques and the variability of directions in which techniques were applied were significantly correlated with number of wins and the number of points and *ippon* scored [1]. It has also been demonstrated that imagery training can be considered as an innovative one. Hand and foot techniques significantly correlate with the choice of preferred attack directions in contest situations [2].

The purpose of this research was to determine the effects of those newly introduced judo regulations on the effectiveness of techniques as well as on the results obtained by men's national judo teams.

## MATERIAL AND METHODS

Research material was gathered during World Championships in Rotterdam (2009) and Tokyo (2010). In Rotterdam, 327 contests played by 334 competitors from 96 countries were recorded. In Tokyo 484 contests were recorded, they were played by 527 competitors from 105 countries. Male judo competitors were subject to our observations. Standard audio-video equipment was used. The film and material was described in graphic forms [3]. The analysis covered only seven weight categories – open category played in 2010 was not included. The national teams' contest effectiveness was determined according to the following three criteria:

1. Medal classification of national teams.
2. Amount of points for particular places for each national team (1<sup>st</sup> – 9 pts., 2<sup>nd</sup> – 5 pts., 3<sup>rd</sup> – 3 pts., 5<sup>th</sup> – 1 pts.).
3. Amount of points for one competitor who participated in the analysed competitions.

Predominant techniques were determined based on:

1. The number of attacks where *ippons* were scored,
2. The number of all effective scored attacks,
3. Average scores (*ippon*, *waza ari*, *yuko*) obtained in one contest.

Determining the contest effectiveness as well as the dominant techniques the following formula has been used:

$$K = K1 + K2 + K3$$

K – final classification,

K1 – according to the first criterion classification,

K2 – according to the second criterion classification,

K3 – according to the third criterion classification.

If we have the same K1 + K2 + K3 sum of points, consecutive places will be determined by higher place in K1 ranking, then K2 and K3 finally.

The effectiveness of the classifications of judo techniques groups was shown by average scores obtained in one contest (Sa).

The effectiveness indices we can determine by analysing referee judgements (scored points) of efficiently executed techniques calculated per one contest.

We calculate it as follows:

$$Sa = 5 \times M + 7 \times M + 10 \times M/n$$

Sa – attack efficiency index,

5, 7, 10 – scored points at efficient attacks (*yuko*, *waza ari*, *ippon*),

M – number of effective attacks, performed by the examined judokas,

n – number of the analysed contest.

The classification of technique groups was based on the Kodokan Judo [4]. The writing forms and the names of judo techniques have been used in accordance with "Kodokan New Japanese-English Dictionary of Judo" by Kawamura and Daigo [5].

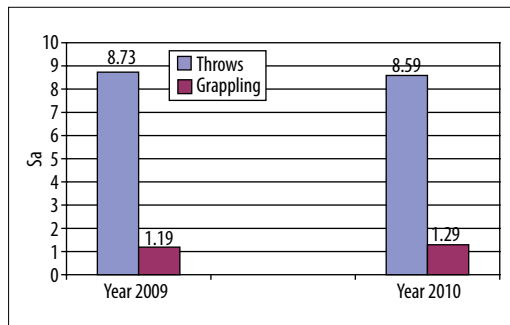
## RESULTS

In 2009 players from Korea were ranked as first whereas the Japanese national judo team gave the worst performance ever in their world championships participation. They won only two medals – silver and bronze. According to the criteria adopted in the study contest effectiveness of Japanese judo competitors was ranked at 8<sup>th</sup> position. However in 2010 the Japanese team won five medals (three gold, one silver and one bronze) in weight categories, and they secured their 1<sup>st</sup> place, while Korea was classified at the 5<sup>th</sup> position (Table 1). Additionally, in the open category, the Japanese judokas won three medals, one gold and two bronze ones.

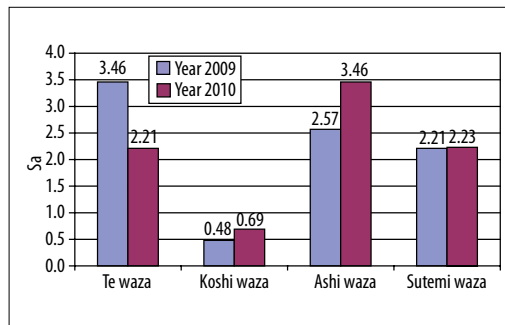
After the changes in regulations were introduced in 2010, such throws as *sukui nage*, *kuchiki taoshi*, *kibisu gaeshi* are only allowed as combination and counterattack forms. These techniques were ranked (K) as 14<sup>th</sup>, 23<sup>rd</sup>, 32<sup>nd</sup> respectively.

**Table 1.** Contest effectiveness of men’s teams competing in the World Judo Championships in 2009 and 2010.

<b>Position (K)</b>	1	2	3	3	5	5	7	8	9	10-10
<b>K1-K2-K3</b>	1-1-1	2-2-2	3-3-4	3-3-4	3-5-6	3-5-6	8-11-3	7-7-12	8-8-10	8-11-8
<b>WChamps 2009</b>	KOR	RUS	UKR	KAZ	MGL	FRA	PRK	JPN	ESP	BLR-CUB
<b>Position (K)</b>	1	2	3	4	5	6	7	8	9	10
<b>K1-K2-K3</b>	1-1-1	2-2-4	4-3-6	4-7-2	3-4-7	6-4-5	6-6-3	9-10-9	10-8-10	11-11-7
<b>WChamps 2010</b>	JPN	FRA	UZB	GRE	KOR	BRA	NED	GER	RUS	AZE



**Figure 1.** Effectiveness of throws and grappling techniques during World Champs 2009 and 2010.



**Figure 2.** Effectiveness of throws during World Champs 2009 and 2010.

**Table 2.** Predominant throwing techniques during World Championships in 2009 and 2010.

Position (K)	World Championships 2009			Position (K)	World Championships 2010				
	Techniques	K1	K2		K3	Techniques	K1	K2	K3
1	Seoi nage	1	1	1	Seoi nage	1	1	1	
2	Uchimata	2	3	3	2	Uchimata	1	2	2
3	Kuchiki taoshi	5	2	2	3	Osoto gari	2	3	3
4	Kosoto gari	3	3	4	4	Kouchi gari	4	4	5
5	Sumi gaeshi	4	5	5	5	Ouchi gari	9	5	4
6	Kesa gatame	6	6	6	6	Uki waza	7	6	6
7	Sukui nage	7	6	7	7	Tani otoshi	6	7	7
8	Osoto gari	8	8	8	8	Kesa gatame	4	10	8
9	Ouchi gari	9	9	9	9	Sumi gaeshi	10	7	9
10	Tani otoshi	10	10	16	10	Tai otoshi	8	9	10

*Kata guruma* and *morote gari* throws were not effectively executed after the rule changes were implemented, though in the previous competitions they were highly effective [6]. Some competitors were disqualified for grasping legs:

*Sukui nage*: 4 competitors

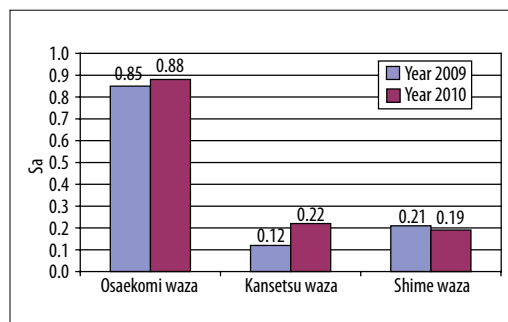
*Kuchiki taoshi*: 2 competitors

*Kata guruma*: 1 competitor

Those seven players disqualified were 1.3% of the total number of competitors participating in Tokyo.

Our results showed that with the new rules being enforced, the effectiveness of attack (Ea) in the throws and

grappling group is similar (Figure 1). The effectiveness of hand throws decreased and such throws as: *kuchiki taoshi*, and *sukui nage* were not dominant (Table 2). It can be recognized as the consequence of the changes in sport regulations. The effectiveness of leg throws in the World Champs 2010 resulted from domination of such throws as: *uchimata*, *osoto gari*, *kouchi gari* and *ouchi gari*. Previously, performance of those throws was hampered by grasping legs (Figure 2). The effectiveness of hip and “sacrifice” throws did not significantly change after the modification of judo contest regulations. Immobilizations were predominant techniques within grappling techniques during the events under analysis (Figure 3).



**Figure 3.** Effectiveness of grappling techniques during World Champs 2009 and 2010.

## DISCUSSION

The improvement of Japanese national team contest effectiveness was confirmed as well as a change in performance of hand and leg throws after the introduction of new contest rules in 2010. The significant changes in the performance of throws and grappling techniques during World Champs in 2009 and 2010 were not observed. The obvious changes however, were observed in the effectiveness of hand and leg throws. The rule which prohibits competitors from direct grasping opponent's legs, has resulted in decrease of effectiveness of throws as: *kuchiki taoshi* and *sukui nage*, and as a result of that the performance of the group of hand throws (*te waza*) diminished. One may assume that the changes have created more favourable conditions for using such leg throws as: *uchimata*, *osoto gari*, *kouchi gari*, *ouchi gari* etc. Is it a return to the "classical" style of judo combat, where there were many successful attacks by using leg throws? Have new rules "up-righted" the postures of players? [7–9]. Such questions call for further observations. It is believed that throws involving leg grasping are of wrestling and various national/regional combat styles origins. Those techniques were successfully performed by wrestlers and sambo, jujutsu athletes who also took part in judo competitions. Those competitors, strongly leaned forwards, had opportunities to grasp their opponents' legs; and they defended themselves against classical attacks [10,11]. Seven competitors were disqualified during the 2010 World Championships, because of attempting those throws; it was 2.3% of total number of participants. It may indicate that the new rules have in operation. The other group of techniques performance has not significantly increased. Within "sacrifice"

throws, the effectiveness of *uki waza* increased, because that throw does not call for grasping legs. Some changes in low values of arm locks and strangleholds might have resulted from competitors' individual abilities; however they have to be confirmed in further observations. The observations of judo competitions and their analysis have been carried on for many years. They aim at finding new ways to increase judo contest effectiveness and improving the training process. Many authors, since the establishment of judo competitions, have carried on observations and the analysis of judo contest which were the basis for assessment of tactical-technical preparations of judo players [12–28]. Any decisions about introduction of the changes in contest rules, may be carried out on the basis of conclusions resulted from observations and their analysis. The newly introduced rules of judo contests are the ground for correcting the basic programmers of teaching judo techniques as well as modification of individuals' judo training and their *tokui waza* (individual technique).

Changes in the sport judo rules have forced the way of judokas' preparation competition. Therefore forms and ways of performing techniques in judo depend mainly on morphological characteristics [29,30], aerobic and anaerobic capacities [31] as well as physical fitness and coordination skills [32]. Appropriate supplementation in judo [33] and nutrition [34] should also be considered both during training and competitions.

## CONCLUSIONS

Our observations suggest, that after changing the contest rules (prohibition of grasping legs) the increase in contest effectiveness of the Japanese men national team has been noticed. The changes in the effectiveness of throws and grappling have not been observed. The increase in the leg throws performance has been seen (*kouchi gari*, *osoto gari*, *ouchi gari* and *uchimata*). The effectiveness of various forms of *uki waza* throws has also increased.

According to our analysis of the changes in judo one can observe a classical way of running judo contests. It was obvious during the World Championships which sports results have been analysed in our research. Therefore the system of preparation for judo sport competitions, at the top sport level, should be adapted to new judo sport rules.

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