

Effects of the International Judo Federation Refereeing Rules on the match results and points in the All-Japan Judo Championships

Authors' Contribution:

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

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Abstract

Background & Study Aim:

The All-Japan Judo Championships (AJJC) is an open-weight tournament to determine the best judoka in Japan. The AJJC has been held under the Kodokan Judo Refereeing Rules (KDK Rules) since 1951. In 2011, the All-Japan Judo Federation introduced the International Judo Federation Refereeing Rules (IJF Rules). In this study, we aimed to clarify the effects of IJF Rules on match results and points in the AJJC.

Material & Methods:

The 115 judo matches in the AJJC from 2009, 2010, 2014 and 2015 were separated into two groups, the KDK Rules' tournaments (2009, 2010) and the IJF Rules' 2014–2016 tournaments (2014, 2015), and compared. The winning content, winning methods, attack efficiency index (AEI) and penalty per minute (PPM) were analysed for each match.

Results: Regarding winning content, in IJF Rules' 2014–2016 tournaments, wins by *ippon* significantly increased, whereas wins by superior performance significantly decreased when compared with KDK Rules' tournaments. Furthermore, for winning methods, wins by technique significantly increased; however, wins by decision significantly decreased in the IJF Rules' 2014–2016 tournaments when compared with KDK Rules' tournaments. The AEI significantly increased; however, PPM showed no difference between IJF Rules' 2014–2016 and KDK Rules' tournaments.

Conclusions: Results suggested that IJF Rules have positively affected AJJC match results and points, and they have also made tournaments more exciting and appealing to audiences.

Keywords: combat sports • competition rules • competition content • open-weight tournament • comparative analysis

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Kodokan Judo Refereeing Rules
– regulations for matches and refereeing established by the Kodokan for use in Japanese judo competitions [25].

International Judo Federation Refereeing Rules – a set of rules and regulations established in 1967 by the IJF, based on KDK Rules and subsequently further developed [25]. Although rules in the AJJC 2014 and 2015 were applied to IJF Rules 2014–2016, the following rules were originally applied at the AJJC: 1. Each match formerly had three judges; 2. Two *shido*-point differences defined ‘subtle differences’ of wins by superior performance; 3. When the match result was even and match points or *shido* points differed by only one, there was no extra contest and three judges decided by flags; 4. All matches were 6-minute contests [26].

Waza – a technique or movement which is based on a standard form and is used to challenge and defeat the opponent [29].

Nage-waza – throwing techniques.

Katame-waza – grappling techniques that include holds, locks, and joint manipulation [29]

Ippon – one point. Achieved through the execution of a valid technique on the opponent [29].

Waza-ari – a judo term for a technique that cannot be regarded as a full *ippón*, but is very close [29].

Waza-ari awasete ippón (an *awase-waza*) – combination of two *waza-aris* is awarded when a athlete who has already received a *waza-ari* then receives another *waza-ari*, with these combined.

Yuko – effective/moderate advantage refers to a point which is awarded in accordance with the judgment of a technique. In the case of an *osae komi waza* (hold-down techniques), a *yuko* is awarded when a contestant pins the opponent for 20 seconds or longer, but less than 25 seconds.

Flag decisions – wins by decision occurred when point differences were less than *yuko* or *chui* in KDK Rules [27]. In contrast, wins by decision occurred when the contest had even *shido* points or less than one *shido*-point difference in IJF Rules 2014–2016 [25].

INTRODUCTION

In Japan, winning at the Olympic Judo Games (OG), World Judo Championships (WC) and All-Japan Judo Championships (AJJC) is known as a Grand Slam. From a Japanese perspective, the AJJC is recognized as being at the same level as the OG and WC [1]. It is believed that, historically, the AJJC formed Japanese competitive judo and that, in Japan, the competition’s content has affected judo itself [2]. Therefore, discussing the AJJC objectively should be a principle method of directing the development of both Japanese and competitive judo.

The AJJC is an open-weight competition to find the number-one male *judoka* in Japan. The *Kodokan Judo Refereeing Rules* (KDK Rules) have been used since the fourth competition in 1951; however, they were changed to the *International Judo Federation Refereeing Rules* (IJF Rules) in 2011. The All-Japan Judo Federation (AJJF) made changes to the rules to correspond with the increased number of competitions in Japan and overseas using IJF rules and to correspond with the selection of the athletes for the Japanese national team [3]. However, the IJF Rules were formed for competitions with weight divisions, but as the AJJC is an open-weight competition, this has raised concerns [4, 5]. Specifically, Table 1 shows the main differences between KDK Rules and IJF Rules.

Following a comparison study of six AJJCs using KDK Rules’ tournaments (2008–2010) and IJF Rules’ 2011 tournaments (2011–2013), Miyake et al. [6] found that the proportions of winning content, winning methods, point-scoring techniques (*waza*) and *mate*-time showed a decrease in wins by decisions and *mate*-times with IJF Rules. Miyake et al. [7] also reported a comparison of winning content, winning methods and total points between tournaments using the two sets of rules, showing that using IJF Rules increased the proportion of wins by *ippón* and by technique; however, they decreased the proportion of wins by superior performance and decision.

As these studies show, IJF Rules affected AJJC competition content, especially match results. However, match-deciding points have not yet been analysed in detail. To fully examine the effects of IJF Rules on AJJC competition content, studies focusing on point scoring and match results should be conducted. However, prior studies have compared varied numbers of IJF and KDK Rules’ competitions, but the number of competitions should be similar to improve comparisons [7]. Consequently, studies should examine an equivalent number of competitions using KDK and IJF Rules and also re-examine any trends in match results.

In this study, we aimed to clarify the effects of IJF Rules on match results and points in the AJJC.

Table 1. Main differences between KDK Rules and IJF Rules (2011 and 2014–2016)

	KDK Rules [27]	IJF Rules 2011 [28]	IJF Rules 2014–2016 [18]
Penalty	1. Kyoikuteki-Shido	1. Shido	2. Shido
	2. Shido	2. Hansoku-make	3. Hansoku-make
	3. Chui		
	4. Keikoku		
	5. Hansoku-make		
Difference in penalties	„No-combativity”	Kyoikuteki-Shido	Shido
	“To go outside the contest area”	Chui	Shido
	“Attacks or blocking to below the belt”	No penalty	Hansoku-make
		Chui = Yuko	2. Shido = Yuko
Value of penalties			2. Shido < 3. Shido
	Keikoku = Waza-ari	3. Shido = Waza-ari	< Yuko < Waza-ari
Points	Points		
	Ippon	30 sec	25 sec
	Waza-ari	25–29 sec	20–24 sec
	Yuko	20–24 sec	15–19 sec
Osaekomi-time			10–14 sec

MATERIAL AND METHODS

Participants

In this study, 115 AJJC judo matches from 2009, 2010, 2014 and 2015 were separated into two categories based on the rules used: 73 matches under KDK Rules (2009, 2010) and 82 matches under IJF Rules 2014–2016 (2014, 2015).

Procedure

To examine effects of IJF Rules and acquire some knowledge for future rules at the AJJC, we used an equal number of KDK and IJF Rules competitions to compare competition content, including points and match results. As a previous study showed no significant relationship between KDK and IJF Rules 2011 tournaments [7], the IJF Rules' 2011 tournaments were excluded from this study.

Data on these tournaments were gathered from AJJC records of the official Kodokan journal *JUDO*, which contains detailed results for each match [8–11] and from AJJC-recorded tournament movies, which were used to check data when the journal's competition content was unclear. From these materials, the following three results of each match were entered into Microsoft Excel 2011 and used to conduct analyses: (1) number and kind of points scored from technique; (2) number and kind of points scored from penalties; (3) total time of the match.

Analysis items

Match results

For match results, winning content and winning methods were examined according to the previous study by Miyake et al. [6, 7]. Matches were categorized into wins by *ippon* and by superior performance. Wins by *ippon* included *ippon*, *waza-ari awasete ippon*, *sogo-gachi* and *hansoku-make*. Matches won by superior performance were decided by means other than those just listed. Winning methods were divided into technique, penalty and decision. Wins by technique were won by points earned from technique (*ippon*, *waza-ari* and *yuko*), wins by penalty were won by points given by opponents for penalties (*hansoku-make*, *keikoku*, *chui* and *shido*) and wins by decision were won by judges' *flag decisions*.

Points

Wins in judo matches are decided on the basis of the number and value of points from technique and penalties. Points were analysed separately, depending on whether they were scored

from technique or penalty. Points from techniques were calculated using the attack efficiency index (AEI) as shown below.

$$\text{AEI} = (5p \cdot \text{YN} + 7p \cdot \text{WN} + 10p \cdot \text{IN}) / \text{CN}$$

(YN the number of *yuko*, WN the number of *waza-ari*, IN the number of *ippon*, CN contest number)

Points from penalties were calculated using penalty per minute (PPN) as shown below.

$$\text{PPM} = \text{PN} / (\text{CT} / 60)$$

(PN the number of penalties, CT the contest time in seconds)

The AEI shows the effects of throw technique and has been used for the analysis of international competitions [12, 13]. In this study, therefore, this index was chosen for comparing changes between points from techniques in IJF and KDK Rules' competitions. PPM shows the number of penalties per minute, instead of the total points from penalties. The PPM index is used for the first time in this kind of study, and we believe that this method effectively shows points from penalties, as match times can vary.

Statistical Analysis

To examine effects of IJF Rules, we compared the two indexes above for tournaments with KDK and IJF Rules (2014–2016). A chi-square test and residual analysis were used to compare winning content and winning methods. An independent *t*-test was used to compare AEI and PPM. Statistical significance for each test was assumed at $p < 0.05$.

RESULTS

Differences in match results for KDK and IJF Rules

Table 2 displays the significant difference in winning content between categories of competition by *ippon* and a lower proportion of wins by superior performance.

Table 3 shows the significant difference in winning methods between the two categories of competition (chi-square value = 9.9, $p < 0.05$). IJF Rules' 2014–2016 tournaments had a higher proportion of wins by technique and a lower proportion of wins by decision.

Shido – instruction/light penalty (penalties for rules violations are ranked in the following ascending order of severity: *chui*, *keikoku*, *hansoku make*).

Chui – light penalty.

Keikoku – warming.

Hansoku-make – defeat by grave infringement or accumulated light penalties, or when committing another rules violation after having already drawn a *keikoku* (warning). is equivalent to an opponent's *ippon gachi* (win by *ippon*).

Sogo-gachi – similar to *awase-waza*, but it is the result of a combination of one's own *waza-ari* and warnings given to one's opponent [25]. However, AJJC tournaments had no *sogo-gachi* rules since 2014, owing to distinguishing between points from technique and from penalties in IJF Rules 2014–2016.

Mate – the referee calls a *mate* (wait) to temporarily stop a contest due to a problem which has occurred.

Table 2. The winning content's relationships between each tournament

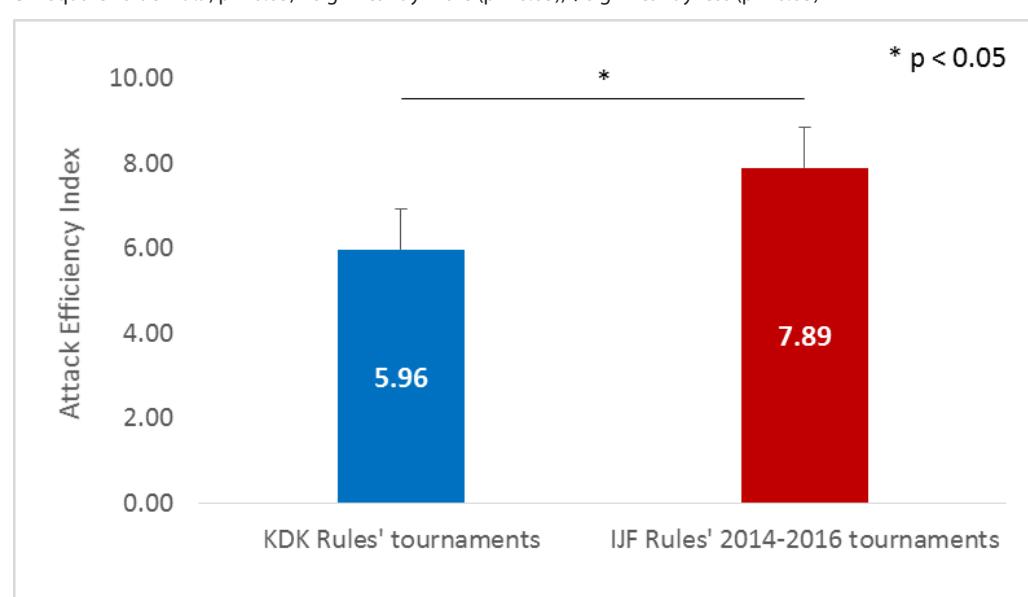
	KDK Rules' tournaments	IJF Rules' 2014-2016 tournaments	Total
Wins by <i>Ippon</i>	28 (38.4%)†	50 (61.0%)*	78 (50.3%)
Wins by superior performance	45 (61.6%)*	32 (39.0%)†	77 (49.7%)
Total	73 (100%)	82 (100%)	155 (100%)

Chi-square value = 7.0; p < 0.05; * significantly more (p < 0.05); † significantly less (p < 0.05)

Table 3. The winning method's relationships between each tournament

	KDK Rules' tournaments	IJF Rules' 2014-2016 tournaments	Total
Wins by technique	40 (54.8%)†	58 (70.7%)*	98 (63.2%)
Wins by penalty	10 (13.7%)	15 (18.3%)	25 (16.1%)
Wins by decision	23 (31.5%)*	9 (11.0%)†	32 (20.6%)
Total	73 (100%)	82 (100%)	155 (100%)

Chi-square value = 9.9; p < 0.05; * significantly more (p < 0.05); † significantly less (p < 0.05)

**Figure 1.** Differences in AEI for KDK Rules' tournaments and IJF Rules' 2014-2016 tournaments

Differences in points for KDK and IJF Rules

For the two tournament categories, Figure 1 shows that IJF Rules 2014–2016 tournaments have a significantly higher AEI value than KDK Rules tournaments ($p < 0.05$). For the two tournament categories, shows no significant difference in PPM values between KDK Rules and IJF Rules 2014–2016 tournaments (Figure 2).

DISCUSSION

This study examined effects of IJF Rules on AJJC competition content by analysing match results

according to winning content and winning methods and according to points from AIE and PPM. AJJC tournaments were categorized into KDK Rules' and IJF Rules' 2014–2016 tournaments for these analyses.

For winning content, the proportion of wins by *ippon* was significantly higher in IJF Rules' 2014–2016 (61.0%) than in KDK Rules' tournaments (38.4%), whereas the proportion of wins by superior performance was significantly lower in IJF Rules' 2014–2016 tournaments (39.0%) than in KDK Rules' tournaments (61.6%). For winning

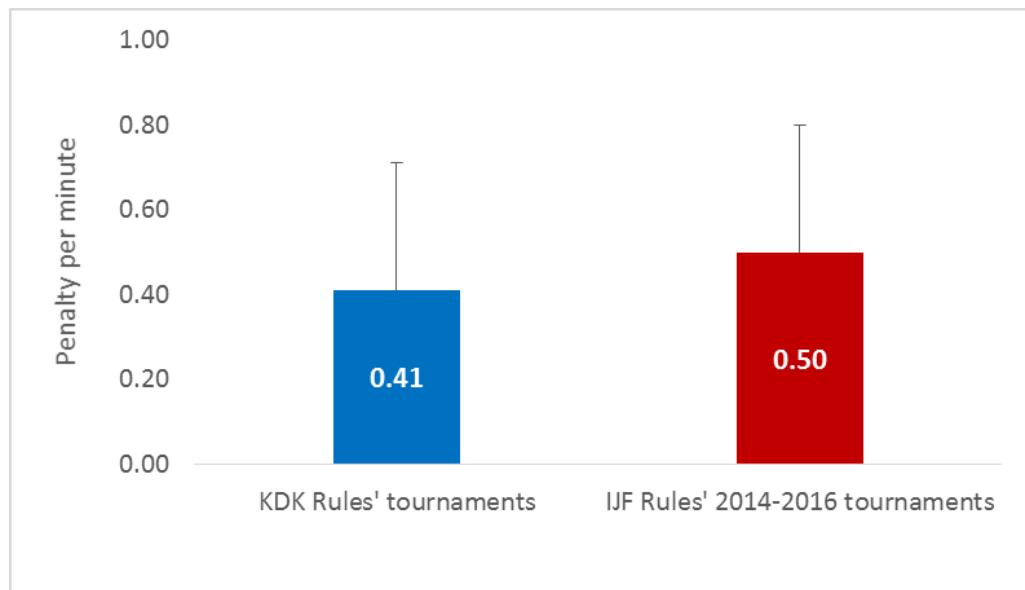


Figure 2. Differences in PPM for KDK Rules' tournaments and IJF Rules' 2014-2016 tournaments

methods, the proportion of wins by technique was significantly higher in IJF Rules' 2014-2016 tournaments (70.7%) than in KDK Rules' tournaments (54.8%), whereas the proportion of wins by decision was significantly lower in IJF Rules' 2014-2016 (11.0%) than in KDK Rules' tournaments (31.5%). In other words, proportions of matches with wins by *ippon* and by technique increased, and proportions of matches with wins by superior performance and by decision decreased through introducing IJF Rules. These changes resulted from differences between KDK Rules' and IJF Rules' 2014-2016 tournaments; IJF Rules seem to have influenced match results in AJJC tournaments. The increase in wins by *ippon* and by technique and the decrease in wins by superior performance and by decision through introducing IJF Rules 2014-2016 to AJJC tournaments were also reported in a previous study [7]. Sakamoto et al. also reported that changes in IJF Rules led to increases in wins by *ippon* and decreases in wins by superior performance and by decision at the OG [14]. Results from this study include increases in wins by *ippon* and by technique and decreases in wins by superior performance and by decision, thus confirming previous studies' results on effects of changes to the rules. Therefore, moving to IJF Rules has most likely caused these results. Presumably, IJF Rules were the main factor. However, match results could also be influenced by athletes' abilities and conditions; therefore, assuming that these changes

resulted only from effects of IJF Rules is risky. The IJF revised its rules to rebuild traditional judo in which athletes seek an *ippon* [15]. The revision also includes a change to increase attacks to make judo more exciting for an audience, including those who do not know much about it [16]. By making penalties strict so that athletes attack more actively [17], the IJF has, in essence, recommended that matches should be won by technique, including *nage-waza* and *katame-waza*, rather than by flag decision and penalty [14]. For these reasons, IJF Rules are expected to have had positive effects on AJJC match results.

For points from techniques, AEI values were significantly higher in IJF Rules' 2014-2016 tournaments (7.89) than in KDK Rules' tournaments (5.96). Although no statistically significant PPM difference emerged between KDK and IJF Rules' tournaments (0.50); IJF Rules' 2014-2016 tournaments had a slightly higher PPM than KDK Rules tournaments. In short, the AEI has increased, and PPM tended to increase with IJF Rules. As previous studies have shown, introducing IJF Rules has caused differences between tournaments. Therefore, we believe that changes in the current study result from the introduction of IJF Rules. Ito et al. compared international tournaments in 2012 and 2013, finding no statistically significant difference in the AEI, but the AEI has increased with a revision of IJF Rules [13]. Sakamoto et al. [14] reported that the total

number of penalties tended to increase at the OG after the revision. A previous study also reports that IJF Rules 2014–2016 possibly contributed to an increase in the numbers of points from techniques and from penalties at the AJJC [7]. As mentioned, points from techniques and from penalties are affected by revisions of rules, so the increase in the AEI and the slight increase in PPM were likely affected by the use of IJF Rules. IJF also has new rules that KDK does not include, for instance, ‘covering the upper part of the jacket lapel to prevent gripping’ and ‘breaking the opponent’s grip with two hands’ [18] to give *shido* to the athlete who defends and retreats [19]. However, matches consisting of nothing but penalties could also lose judo’s excitement and appealing to judoka [20], so matches and tournaments need to adhere closely to the rules and make judo active with many attacks [17]. In ideal judo matches, athletes actively earn points from techniques. In this study, the AEI increased and PPM tended to increase; therefore, IJF Rules seem to have had a positive effect. These results showed that matches with wins by *ippon* and by technique have increased, thus changing match results in a positive way.

On the basis of these facts, IJF Rules have positively affected the AJJC, making matches more exciting and appealing for audiences, and this information could be a useful tool for considering future AJJC rule changes. In this study, however, we have not considered effects of IJF Rules on differences in athletes’ heights and weights. After examining effects of height and weight differences on AJJC wins from 1980 to 1989, Matsui et al. reported that open-weight tournaments are justified because lightweight athletes have a sufficient chance to win [21]. We still need

to consider if AJJC open-weight tournaments are relevant with the inclusion of IJF Rules 2014–2016 because those rules hinder smaller athletes [22, 23]. Japanese judoka see the importance of open-weight tournaments, including the AJJC; this indicates the value of overcoming the weight disadvantage of competing against athletes with different physiques [24].

CONCLUSIONS

The following findings highlight our research.

The proportion of matches with wins by *ippon* and by technique increased from KDK Rules’ to IJF Rules’ 2014–2016 tournaments, whereas the proportion of matches with wins by superior performance and by decision decreased. This suggests that IJF Rules positively affected AJJC match results.

The AEI increased from KDK Rules’ to IJF Rules’ 2014–2016 tournaments. This increase positively affected match results, and it is expected to cause increases in match wins by *ippon* and by technique.

Results suggest that IJF Rules have positively affected AJJC match results and points, and they have also made tournaments more exciting and appealing for audiences.

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