

Analysis of fighting actions of judo competitors on the basis of the men's tournament during the 2008 Olympic Games in Beijing

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Key words: judo, combat sports, martial arts, analysis

Summary

Introduction. The aim of this work was to provide a characteristics of the judo combat and present factors that may influence the result of a sports combat. On the basis of the tournament's result analysis, the combat specifics of the world's top athletes were determined and may be used to orient and streamline a training process.

Material and methods. The study materials were the combat lists from the men's judo tournament in Beijing as published on the official website of the Olympic Games. The indirect observation method was applied, using computerised and available information concerning each combat. Basic statistical methods were used to process the data: arithmetic means and percentage compilation.

Results. During the men's tournament, there was a total of 303 combats in all 7 weight categories. Altogether, there were 228 competitors participating. No country gained a clear advantage in the medal classification. A significant part of combats (66.67%) ended by *nage-waza* (throwing), of which the *te-waza* (hand) (27.06%) and *ashi-waza* (foot and leg) (23.43%) techniques most often decided about the victory. The *katame-waza* (grappling) techniques ended 15.51% of all combats. Out of all 47 combats that ended in a horizontal position, 37 ended by *osaekomi-waza* (holding).

Conclusions. 1. Most combats of the men's tournament ended before time and the score awarded most often by referees was *ippon*. 2. The victories were most often awarded in consequence of the *nage-waza* (throwing) techniques rather than the *katame-waza* (grappling) techniques. 3. The *te-waza* (hand) throwing group techniques proved to be dominating.

Introduction

Judo is a sports form of a full contact combat and belongs to a very popular group of martial arts. Official contests are organized in accordance with determined rules, contestants are classified, etc. The competition consists in a direct fight between two competing athletes, similarly as in wrestling, box or sumo [1]. Judo is not only a sport, it is also a martial art. „Self-perfection” and „mutual good and benefit” are the rules that encourage systematic development and exercise of the physical and psychical sphere. It encourages the respect of one's own work, learning of new grips and holds and perfection of the ones already known. Taking care of one's own and the partner's health and safety as well as assisting the partner in achieving successes is a highly ethical rule [2,3]. Numerous studies indicate that judo is a factor significantly contributing to somatic [4-8] and psycho-social [9-11] health. Besides important moral rules, such as respect to one's partner and exchanging bows during judo training, there is also

an element of competition and it plays a significant role. Competition is the main stimulus motivating athletes to a comprehensive development of their skills and abilities. This is why results obtained by a competitor in a sports competition constitute for the athletic training staff the most important factor verifying the effectiveness of the training methods applied [12]. The more sports character there is in judo the more spectacular and dynamic the combat becomes. Hence, the search for new and more effective ways for the competitors to fight the combat. In all disciplines, especially in combat sports, the success is decided by the efficiency of one's actions, which, in turn, depend on the physical and psychical preparation as well as the tactics followed. In the case of judo, the observation and analysis of combats at the world's top events provides feedback information on current tendencies. Both, women's [13] and men's [22] competitions are analysed. Combats at the highest rank events, such as the Olympic Games, World Championships and European Championships [14] are analysed. Basing on this, one is able to tell

what technical and tactic elements produce the intended goal, i.e. the victory. The aim of this work was to provide a characteristics of the judo combat and present factors that may influence the result of a sports combat. When undertaking the combat analysis, we wondered what technical elements were most effective in the *ne-waza* (horizontal position) and the *tachi-waza* (standing position) combats. We wondered what the most frequent award ending the fight had been. We also tried to determine whether or not there was any significant difference between technical elements and the ways of combat victory award in different weight categories.

Material and methods

The study materials were the combat lists from the men's judo tournament in Beijing as published on the official website of the 2008 Olympic Games. The indirect observation method was applied, using computerised and publicly available information concerning each combat. To process the data, basic statistical methods were used: arithmetic means, percentage compilation. We took into consideration, among other things, the number of scores won (e.g., *Ippon*, *Waza-ari*, *Yuko*, *Koka*) and penalties for rule infractions (*Shido I*, *Shido II*, *Shido III*, *Shido*). The analysis also comprised the technical actions that decided about the victory. They were divided into the group of throws (*nage-waza*) and a group of holds (*katame-waza*). The increasing sports level in this discipline and the willingness to achieve results have led the competitors to search for new solutions of how to win a combat. During our analysis, we encountered the problem how to define and name a few techniques, that were a sort of movement creativity. We decided to leave them undefined. The remaining combats were divided into actions ended in the upright position and the horizontal position. All data were summed up, divided and discussed separately for each weight category and jointly for all categories. In order to ensure a better presentations, some results are given in tables.

Results

The judo tournament during the Beijing Olympic Games was held on four mats at the same time over the period of seven days. Each day saw the competition in one weight category of men and women. In the men's tournament, there was a total of 303 combats in the following weight categories: – 60 kg, – 66 kg, – 73 kg, – 81 kg, – 90 kg, – 100 kg, +100 kg. Altogether, there were 228 competitors participating. No country had a clear advantage in the medal classification. The representation of South Korea won the highest number of medals amongst men: 1 gold and 2 bronze. The representation of Japan was the only one to win two gold medals. 2 Olympic medals, albeit not gold, were won by: Azerbaijan, Uzbekistan, France, Holland, Cuba and Brazil.

In the men's tournament during the Olympic Games, in the weight category of up to 60 kg, there were 33 competitors. The average age of judokas in this weight category was 25. Most combats were ended by *ippon* – 19, which constituted 43.18% of all combats fought in this category. *Yuko* scores decided about victory in 10 cases and *koka* in 5 cases. In 6 combats, the victory was awarded on the basis of penalties given to the competitors. There were 44 combats, but only one of them ended in extra time (golden score).

In the next weight category of 66 kg, there were 33 competitors and their average age was 26. The age of athletes competing in this category ranged from 20 to 33. There were 44 combats in total and 4 of them ended in extra time. Most combats ended by *ippon* – 14 combats (31.82%), *yuko* – 5 combats (11.36%) and *waza-ari* – 5 combats (11.36%). In 9 combats, the victory was awarded on the basis of penalties (3 combats – 1 *Shido*, 6 combats – 2 *Shido*).

The next weight category is 73 kg. As many as 32 athletes were qualified to fight in this weight. The average age of competitors was 26 years. The age of participants in this category ranged from 18 to 35. There were 43 combats, of which 23 ended before time – 20 by *ippon* (46.51%) and 3 by *waza-*

Table 1. Percentage compilation of the victory awards in combats in particular weight categories

No.	Way of victory award	Number of combats won in %						
		-60 kg	-66 kg	-73 kg	-81 kg	-90 kg	-100 kg	+100 kg
1	IPPON	43.18	31.82	46.51	39.13	57.89	55.81	53.33
2	WAZA-ARI-AWASETE-IPPON	2.27	6.82	6.98	2.17	0	4.65	11.11
3	WAZA-ARI	4.55	11.36	11.63	17.39	7.89	9.3	2.22
4	YUKO	22.73	11.36	13.95	8.7	10.53	13.95	8.89
5	KOKA	11.36	9.09	0	0	2.63	0	0
6	HANSOKU	0	0	0	0	0	0	0
7	HANSOKU-MAKE / 4 SHIDO	0	0	2.33	0	0	0	0
8	3 SHIDO	2.27	0	2.33	4.35	0	2.33	6.67
9	2 SHIDO	2.27	13.64	4.65	17.39	5.26	6.97	8.89
10	1 SHIDO	9.09	6.82	0	4.35	7.89	2.33	0
11	YUSEI-GACHI (GOLDEN SCORE)	2.27	9.09	11.63	4.35	5.26	4.65	8.89
12	HANTEI (GOLDEN SCORE)	0	0	0	0	2.63	0	0
13	SOGO-GACHI	0	0	0	2.17	0	0	0

ari-awasete ippon (6.98%). In one combat, the victory was awarded due to the disqualification of the opponent by the *hansoku-make* penalty (4 *Shido*). Five combats ended in extra time.

The next group was the category of 81 kg competitors. In this category, there were as many as 35 competitors. The age of judokas ranged from 18 to 42. Their average age was 26. There were 46 combats, of which 18 ended by *ippon* (39.13%), 8 by *waza-ari* (17.37%) and 4 by *yuko* (8.7%). Very many combats ended by penalties – as many as 12, of which 8 ended by the award of – 2 times *shido*, and 2 combats ended by the award of 1 time *shido* and 3 times *shido*. Two combats ended in extra time (golden score). In one case, the combat ended by a combined victory, i.e. the combination of scores awarded for technical action and penalties imposed on the opponent.

The next category is 90 kg. In this category, there were 30 judokas, whose average age was 27. Their ages ranged from 18 to 35. One combat ended in a tie both in the regular time and in extra time, and the victory was awarded on the basis of the majority opinion of the referees. In the remaining 37 combats, the most frequent way of ending the fight was the action scoring in *ippon* – 22 combats (57.89%). *Yuko* scores decided about victory in 4 cases, and *waza-ari* in 3 cases.

Shido penalties decided about the winner in 5 combats (4 after the award of 1 *shido* and 2 after the award of 2 *shido*).

The penultimate weight category is 100 kg. As many as 34 contestants were qualified in this weight category and in total they fought 43 combats. The competitors' age ranged between 22 and 34 and the mean age was 27. The analysis of this category shows that 55.81% of combats (24) ended by the highest score – *ippon*. The second most frequent way of ending a combat was *yuko* – 13.95%. Five combats ended by the award of penalties (1 *shido* – 1, 2 *shido* – 3, 3 *shido* -1). Two combats ended in extra time (golden score). In the heaviest category, i.e. +100 kg, there were 33 competitors. The average age was 27 years. The ages ranged from 21 to 40. In this category, there is no upper limit of the body mass. The lightest competitor weighed 110 kg and the heaviest – 210 kg. The golden medal winner in this weight category was heavier by only 1 kg than the lightest competitor and weighed 111 kg. The data collected show that 24 combats ended by *ippon* and 5 by *waza-ari awasete ippon*. In total, this gives 29 combats ended before the expiry of the regulation combat time, which constitutes 64.44% of all combats fought in this weight category. There were 45 combats and the victory in 7 of them was decided by penalties. Table 1 presents a percentage compilation of the ways in which combats ended in particular weight

Table 2. Quantitative compilation of the victory awards in combats in particular weight categories

No.	Way of victory award	Number of combats won							TOTAL	
		60 kg	66 kg	73 kg	81 kg	90 kg	100 kg	+100 kg	Number of combats won	Number of combats won in %
1	IPPON	19	14	20	18	22	24	24	141	46.53
2	WAZA-ARI-AWASETE-IPPON	1	3	3	1	0	2	5	15	4.95
3	WAZA-ARI	2	5	5	8	3	4	1	28	9.24
4	YUKO	10	5	6	4	4	6	4	39	12.87
5	KOKA	5	4	0	0	1	0	0	10	3.3
6	HANSOKU	0	0	0	0	0	0	0	0	0
7	HANSOKU-MAKE / 4 SHIDO	0	0	1	0	0	0	0	1	0.33
8	3 SHIDO	1	0	1	2	0	1	3	8	2.64
9	2 SHIDO	1	6	2	8	2	3	4	26	8.58
10	1 SHIDO	4	3	0	2	3	1	0	13	4.29
11	YUSEI-GACHI (GOLDEN SCORE)	1	4	5	2	2	2	4	20	6.60
12	HANTEI (GOLDEN SCORE)	0	0	0	0	1	0	0	1	0.33
13	SOGO-GACHI	0	0	0	1	0	0	0	1	0.33
TOTAL		44	44	43	46	38	43	45	303	

Table 3. Way of awarding victory in extra time (golden score)

No.	Way of victory award	Number of combats won							TOTAL
		-60 kg	-66 kg	-73 kg	-81 kg	-90 kg	-100 kg	+100 kg	
1	IPPON	0	2	1	0	0	0	0	3
2	WAZA-ARI	0	0	1	0	0	0	0	1
3	YUKO	0	1	1	1	1	2	3	9
4	KOKA	1	1	1	1	0	0	0	4
5	1 SHIDO	0	0	1	0	1	0	1	3
6	HANTEI	0	0	0	0	1	0	0	1

categories. As may be read in the table, *ippon* decided about victory in more than one half of combats in the following categories: – 90 kg, where it constituted 57.89% of all combats fought; cat. – 100 kg – 55.81%; cat. +100 kg – 53.33%. The fewest combats ended by *ippon* were in the weight category of – 66 kg (31.82%). *Waza-ari-awasete-ippon* was the award most frequently deciding about victory in the weight category of +100 kg. This category also saw the highest number of combats ended before time. The highest number of combats ended by *waza-ari* was fought in the weight category of -81 kg (17.39%). The *yuko* score most frequently decided about victory in the lowest category of – 60 kg, where it constituted 22.73% of all combats fought. The *shido* penalties most often decided about winning in the category of – 81 kg (1 *Shido* – 4.35%; 2 *Shido* – 17.39%; 3 *Shido* – 4.35%).

Table 2 shows that most combats (141 combats constituting 46.53% of all) ended by *ippon*. The award of *ippon* was most frequently announced in the weight categories of – 100 kg and +100 kg – 24 times. The *yuko* score proved the second most frequent way of awarding victory. It decided about the result of 39 combats (10 in the category of up to 60 kg). Only one combat ended by the *hansoku-make* disqualification. It was in the weight category of – 73 kg – by the award of 4 times *shido*. The remaining *shido* penalties were decisive in 35 combats in total (thirteen by 1 *shido*, twenty-six by 2 *shido* and eight by 3 *shido*).

Since the above analysis does not take into account the way in which extra time ended, i.e. what scores decided about victory in extra time (golden score), such data were compiled and presented in Table 3. It shows that the total of 20 combats

Table 4. Nage-waza (throwing) techniques deciding about the victory

No.	name combination throws		number	%			
1	te waza (hand techniques)		kata-guruma	18	82	27.06	5.94
2			morote-gari	10			3.3
3			seoi-nage	25			8.25
4			tai-otoshi	3			0.99
5			kuchiki-taoshi	14			4.62
6			obi-otoshi	1			0.33
7			kibisu-gaeshi	2			0.66
8			seoi-otoshi	1			0.33
9			kouchi-gaeshi	1			0.33
10			sukui-nage	6			1.98
11			sumi-otoshi	1			0.33
12	koshi waza (hip techniques)		sode-tsurikomi-goshi	6	9	2.97	1.98
13			o goshi	3			0.99
14	ashi waza (foot and leg techniques)		uchi-mata gaeshi	5	71	23.43	1.65
15			uchi-mata	13			4.29
16			sasae-tsurikomi-ashi	1			0.33
17			o-uchi-gari	9			2.97
18			o-uchi-gaeshi	1			0.33
19			o-soto-gari	7			2.31
20			o-soto-gaeshi	2			0.66
21			obi-tori-gaeshi	2			0.66
22			ko-uchi-gari	10			3.3
23			ko-soto-gari	2			0.66
24			ko-soto-gake	10			3.3
25			harai-goshi	3			0.99
26			hane-goshi	1			0.33
27			de-ashi-barai	4			1.32
28	ashi-guruma	1	0.33				
29	sutemi waza (sacrifice techniques)	rear	tomoe-nage	10	40	13.2	3.3
30			sumi-gaeshi	12			3.96
31			tani-otoshi	5			1.65
32			yoko-otoshi	4			1.32
33			yoko-gake	1			0.33
34		side	harai-makikomi	1			0.33
35			soto-makikomi	3			0.99
36			o-soto-maki-komi	1			0.33
37			yoko-guruma	2			0.66
38			harai-makikomi	1			0.33
total				202		66.67	

ended by extra time (6.60% of all combats). The most frequent way of awarding victory in extra time was *yuko*. This was the case in 9 combats. The *koka* score decided in 4 combats, while *ippon* and *1 shido* in 3 combats each. When analysing particular weight categories, one notes that most combats ended in extra time took place in the 73 kg category (5), and fewest in the 60 kg category (only one).

The next goal of this work was to analyse the use of techniques deciding about the victory. In the 60 kg category, there were 44 combats and 6 of them ended by the award based on penalties, while in 2 combats the technique was not specified. The remaining combats ended by technical actions. In 31 combats (70.45% of all combats in this weight category), the victory was awarded by *nage-waza* (throwing) technique group. The most frequent type of throws were the hand group throws. They ended 22 combats and constituted one half of contests in this weight. Foot and leg group throws constituted 18.18% of combats in this category (8 times). *Sutemi-waza* (sacrifice technique) occurred only once. Only 5 contests (11.36%) ended by grappling techniques, all of which belonged to the *oseakomi-waza* (holding). *Tate-shiho-gatame* was effectively used twice. There was one occurrence each of *kata-gatame*, *ushiro-kesa-gatame* and *yoko-shiho-gatame*. In total, 18 different techniques deciding about victory were used, and in eleven cases it was the *seoi-nage* throw. The second most frequent throw was *kata-guruma*, which was performed four times. The remaining techniques occurred between 1 and 3 times and included: *morote-gari* 1, *tai-otoshi* 1, *kuchiki-taoshi* 2, *obi-otoshi* 1, *o-uchi-gari* 1, *ko-soto-gari* 1, *ko-uchi-gari* 1, *ko-soto-gake* 1, *o-uchi-gaeshi* 1, *uchi-mata gaeshi* 1, *harai-goshi* 1, *tani-otoshi* 1, *tate-shiho-gatame* 2, *kata-gatame* 1, *ushiro-kesa-gatame* 1 and *yoko-shiho-gatame* 1.

The next analysed weight category was 66 kg. Similarly as in the previous category, there were 44 matches here, and the result of 9 of them was decided by penalties imposed by referees. The largest part of combats constituted throws – 69.18%. The *ne-waza* actions ended 11.36% of all contests (5), including 3 holdings: *kata-gatame* 1, *kesa-gatame* 1 and *tate-shiho-gatame*. In the horizontal position, there also appeared two locks: *te-gatame* and *juji-gatame*. In the *nage-waza* group, the most frequent were hand throws, which were decisive in 13 combats (29.55%), while *ashi-waza*, i.e. foot and

leg techniques, were decisive in 12 contests (27.27%). The most frequently used techniques were: *kata-guruma* 4, *seoi-nage* 3, *kuchiki-taoshi* 3 and *tomoe-nage* 3. Other techniques included: *morote-gari* 2, *uchi-mata* 2, *o-uchi-gari* 2, *ko-uchi-gari* 2, *sukui-nage* 1, *sode-tsurikomi-goshi* 1, *ko-soto-gake* 1, *de-ashi-barai* 1, *harai-goshi* 1, *obi-tori-gaeshi* 1, *ko-soto-gari* 1, *o-soto-gaeshi* 1, *yoko-otoshi* 1.

In the 73 kg weight category, there were 43 combats. Five contests ended by the *shido* penalties, and in the remaining 38 – by the techniques used. The analysis of this category shows, that 69.77% of combats ended by *nage-waza*, and 18.6% by *katame-waza*. The most frequently used were – holding – 7 times, including *kesa-gatame* 3 times, *tate-shiho-gatame* 1, *kata-gatame* 1, *kuzure-kesa-gatame* 1, *yoko-shiho-gatame* 1 and the lock (*te-gatame*) – 1 time. Hand throws decided about success in 15 combats, which constituted 34.88% of contests in this weight category: *kata-guruma* 4, *tai-otoshi* 1, *seoi-nage* 4, *sukui-nage* 2, *kuchiki-taoshi* 2, *ki-bisu-gaeshi* 2. Foot and hand throws – in 9 cases (20.93%): *uchimata* 3, *o-soto-gari* 2, *ko-uchi-gari* 2, *ko-soto-gake* 1, *de-ashi-barai* 1. Only 3 combats ended by the hip throw techniques and 3 by the sacrifice techniques (6.98%): *tomoe-nage* 3, *o-goshi* 2, *sode-tsurikomi-goshi* 1.

In the 81 kg weight category, there were 46 contests, 12 of which ended by imposing the *shido* penalties. The remaining 34 combats ended by technical actions. The *nage-waza* techniques decided about victory in 60.87% of combats fought. The foot and leg throws decided about the result in 19.57% of combats, hand throws in 19.51%, and sacrifice throws in 17.39%. *Katame-waza* led to victory in 13.04% of cases, and included the holding techniques in 6.52% of combats, strangulation techniques in 4.35% of combats and strangulation techniques in 2.17% of combats. In total, as many as 22 techniques deciding about the victory were used, including 16 *nage-waza* techniques (5 each from the following groups: *te-waza*, *ashi-waza* and *sutemi-waza*, as well as one from the *koshi-waza* group) and 6 *katame-waza* (3 from the *oseakomi-waza* group, 2 *shime-waza*, and 1 *kansetsu-waza*). The quantitative characteristics of throws was as follows: *kata-guruma* 1, *morote-gari* 3, *seoi-nage* 3, *sukui-nage* 1, *kuchiki-taoshi* 1, *sode-tsurikomi-goshi* 2, *uchimata* 2, *ko-uchi-gari* 2, *kosoto-gake* 2, *uchimata-gaeshi* 2, *harai-goshi* 1,

Table 5. Katame-waza (grappling) techniques deciding about the victory

No.	name combination ground		number	%				
1	katame waza (grappling techniques)	oseakomi waza	tate-shiho-gatame	8	36	2.64	11.88	
2			kata-gatame	5		1.65		
3			ushiro-kesa-gatame	1		0.33		
4			yoko-shiho-gatame	7		2.31		
5			kuzure-kesa-gatame	2		0.66		
6			kesa-gatame	8		2.64		
7			kami-shiho-gatame	3		0.99		
8			kuzure-kami-shiho-gatame	2		0.66		
9		kansetsu-waza	te-gatame	7	2.31	9		2.97
10			juji-gatame	2	0.66			
11		shime-waza	koshi-jime	1	2	0.33		0.66
12			sankaku-jime	1				
total				47		15.51		

tomoe-nage 2, *sumi-gaeshi* 3, *yoko-gake* 1, *harai-makikomi* 1, *yoko-otoshi* 1.

In *katame-waza*, there appeared the following techniques: *tate-shiho-gatame* 1, *kami-shiho-gatame* 1, *kata-gatame* 1, *ko-shi-jime* 1, *sankaku-jime* 1, *juji-gatame* 1.

In the 90 kg category, five combats ended by imposing the *shido* penalties. One combat ended in a tie, and its result was decided by referees who indicated the contestant what in their opinion had been more active. The remaining 31 contests ended by technical actions. The *nage-waza* techniques decided about victory in 73.68% of combats fought. The foot and leg throws decided about the result in 34.21% of combats, hand throws in 23.68%, and sacrifice throws in 13.16%. *Katame-waza* led to victory in 7.89% of cases, and included the holding techniques in 6.52% of combats and strangulation techniques in 2.63% of combats. In total, as many as 18 techniques deciding about the victory were used, including 16 *nage-waza* techniques (9 from the *ashi-waza* group, 3 *sutemi-waza*, 3 *te-waza* and one *koshi-waza*). As regards the horizontal position, there appeared two *katame-waza* techniques (1 from the *oseakomi-waza* group and 1 from the *kansetsu-waza* group). These were: *tate-shiho-gatame* 2, *te-gatame* 1. In the throwing techniques, the following throws were identified: *kata-guruma* 3, *kuchiki-taoshi* 5, *seoi-nage* 1, *o-goshi* 1, *o-soto-gari* 1, *o-uchi-gari* 1, *ko-uchi-gari* 1, *ko-soto-gake* 2, *de-ashi-barai* 1, *uchi-mata gaeshi* 2, *o-soto-gaeshi* 1, *obi-tori-gaeshi* 1, *uchi-mata* 3, *sumi-gaeshi* 2, *tomoe-nage* 2, *yoko-otoshi* 1.

In the 100 kg category, there were 43 combats. Only one of them ended by the referee's imposing of the *shido* penalty. Four techniques were not defined and the remaining 38 combats ended by technical actions. The *nage-waza* techniques decided about victory in 72.09% of combats fought. The sacrifice throws were decisive in 25.58% of combats, hand throws in 23.26%, and foot and leg throws in 18.6%. The *katame-waza* techniques ensured victory in 16.28% of combats, the holding techniques in 9.3% and the lock techniques in 6.98%. In total, as many as 24 techniques deciding about the victory were used, including 19 *nage-waza* techniques (8 from the following groups: *te-waza*, 6 *ashi-waza*, 4 *sutemi-waza* and 1 *koshi-waza*) and 5 *katame-waza* (4 from the *oseakomi-waza* group and 1 *kansetsu-waza*). The throwing techniques included: *kata-guruma* 1, *morote-gari* 2, *seoi-nage* 2, *sukui-nage* 1, *seoi-otoshi* 1, *kouchi-gaeshi* 1, *tai-otoshi* 1, *sumi-otoshi* 1, *sode-tsurikomi-goshi* 2, *o-uchi-gari* 3, *sasae-tsurikomi-ashi* 1, *de-ashi-barai* 1, *uchi-mata* 1, *hane-goshi* 1, *sumi-gaeshi* 5, *yoko-guruma* 2, *tani-otoshi* 3, *soto-makikomi* 1. Among the *ne-waza* techniques, the holding techniques and locks were prevailing: *kuzure-kami-shiho-gatame* 1, *kata-gatame* 1, *kesa-gatame* 1, *kuzure-kesa-gatame* 1, *te-gatame* 3.

In the heavies category, there were 45 combats, and the *shido* penalties decided about the outcome in 8 of them. In the remaining 37 combats, the victory was the result of techniques used. The *nage-waza* techniques decided about victory in 53.33% of combats fought. Foot and leg throws in 26.67%, sacrifice throws in 17.77%, hand throws in 8.89% of

combats fought. The *katame-waza* techniques ensured victory in 28.89% of combats. In this group, the holding techniques constituted a considerable majority 26.67% and only 2.22% of combats constituted the lock techniques. In total, as many as 22 techniques deciding about the victory were used, including 16 *nage-waza* techniques (6 *ashi-waza*, 6 *sutemi-waza* and 4 *koshi-waza*) and 6 *katame-waza* (5 from the *oseakomi-waza* group and 1 *kansetsu-waza*). The throws included: *kata-guruma* 1, *kuchiki-taoshi* 1, *seoi-nage* 1, *sukui-nage* 1, *o-uchi-gari* 1, *ko-uchi-gari* 2, *ko-soto-gake* 2, *o-soto-gari* 4, *uchi-mata* 2, *ashi-guruma* 1, *sumi-gaeshi* 2, *o-soto-maki-komi* 1, *soto-makikomi* 2, *yoko-otoshi* 1, *harai-makikomi* 1, *tani-otoshi* 1. In *katame waza* there appeared: *tate-shiho-gatame* 1, *kesa-gatame* 3, *kami-shiho-gatame* 2, *kuzure-kami-shiho-gatame* 1, *yoko-shiho-gatame* 5 and *te-gatame* 1.

During the entire men's judo tournament in Beijing there were in total 303 combats. In 36 of them, the victory was decided on the basis of penalties. In one contest, the opponent did not appear on the mat. 249 combats ended by technical actions. Tables 4 and 5 present the throwing techniques (hand, foot and leg, hip, sacrifice) and grappling techniques (holding, strangulation and locks) in all weight categories. Most combats (66.67%) were ended by *nage-waza*, whereby the *te-waza* (27.06%) and *ashi-waza* (23.43%) techniques most often decided about the victory. Among the throwing techniques, *seoi-nage* decided about winning in 8.25%, *kata-guruma* in 5.94%, *kuchiki-taoshi* in 4.62% of combats. The *katame-waza* techniques ended 15.51% of all combats fought. Out of all the 47 combats ended in *ne-waza*, 36 were ended by the *oseakomi-waza* techniques. The *tate-shiho-gatame* and *kesa-gatame* ended 8 combats, i.e. 2.64% of all contests.

Discussion

After the analysis of combats fought during the men's tournament at the Beijing Olympic Games, one may determine the ways in which combats ended and the techniques that ensured the victory. Among the studies of this type, one can note common tendencies. This concerns the most effective techniques and manners of combat settlements [13]. The data gathered in all weight categories show that 141 out of 303 combats fought ended by *ippon* (46.53%). This award was also the most common at the World Cup held in Warsaw in 2005. The analysis of this competition conducted by other authors shows that 58% of all combats ended by *ippon* [19]. The considerable majority of victories awarded by *ippon* is evidenced by the study of combats fought during the 1996 and 2000 Olympic Games made by Sterkowicz et al. [15,17.] They calculated that 59.5% of combats fought in Atlanta and 63% of combats in Sydney ended by *ippon*. A considerable part of contests ended by penalties imposed by the referees. 48 out of all 303 combats ended by one or more *shido*. Most penalties were imposed in the category of up to 73 kg. In this case, a good solution was the amendment to the rules of January 2009, which treated the first penalty as a warning without an impact on scoring. This amendment may lead to a

reduction of the number of combats ended by penalties and may increase the attractiveness of judo for spectators. When comparing particular weight categories, most combats were ended by *ippon* in the following categories – 90 kg., – 100 kg., +100 kg, constituting, respectively, 57.89%, 55.81% and 53.33% of all contests fought. Most combats ended before time, i.e. after the combination of actions resulting in the award of *ippon* and *waz-ari-awasete-ippon* took place in the heaviest weight – 64.44% of all contests in this category.

When comparing all weight categories, one may note that the lightest one stands out as the category with the highest percentage share of *yuko* (22.73%), which decided about winning. A separate analysis concerned the ways in which combats ended in extra time (golden score). In total, there were 21 such combats, which constituted 6.93% of all, and such a number evidences a very even level of contestants. Most often, the golden score, assuring victory and terminating the extra time, was *yuko* – awarded 9 times. The result of extra

Table 6. Presentation of the number of winning combats with a breakdown by techniques

No.	technique name:	number of combats won:
1	seoi-nage	25
2	kata-guruma	18
3	kuchiki-taoshi	14
4	uchi-mata	13
5	sumi-gaeshi	12
6	ko-soto-gake	10
7	ko-uchi-gari	10
8	morote-gari	10
9	tomoe-nage	10
10	o-uchi-gari	9
11	tate-shiho-gatame	8
12	kesa-gatame	8
13	o-soto-gari	7
14	yoko-shiho-gatame	7
15	te-gatame	7
16	sode-tsurikomi-goshi	6
17	sukui-nage	6
18	tani-otoshi	5
19	uchi-mata gaeshi	5
20	kata-gatame	5
21	de-ashi-barai	4
22	yoko-otoshi	4
23	harai-goshi	3
24	o-goshi	3
25	soto-makikomi	3
26	tai-otoshi	3
27	kami-shiho-gatame	3
28	kibisu-gaeshi	2
29	ko-soto-gari	2
30	obi-tori-gaeshi	2
31	o-soto-gaeshi	2
32	yoko-guruma	2
33	kuzure-kesa-gatame	2
34	kuzure-kami-shiho-gatame	2
35	juji-gatame	2
36	ashi-guruma	1
37	hane-goshi	1
38	harai-makikomi	1
39	harai-makikomi	1
40	kouchi-gaeshi	1
41	obi-otoshi	1
42	o-soto-maki-komi	1
43	o-uchi-gaeshi	1
44	sasae-tsurikomi-ashi	1
45	seoi-otoshi	1
46	sumi-otoshi	1
47	yoko-gake	1
48	ushiro-kesa-gatame	1
49	koshi-jime	1
50	sankaku-jime	1

time was least frequently decided by *waza-ari* or the majority opinion of the referees. Most combats in extra time were fought in the 73 kg category. The analysis of techniques deciding about victory shows that 249 combats out of 303 (82.18%) ended in result of an effective application of techniques. One can note a considerable predominance of throws over grappling. The *nage-waza* throws ended 202 combats, which constitutes 66.67% of all combats, while the *katame-waza* grappling ended only 47 combats (15.51%). Similar conclusions concerning the predominance of *nage-waza* over *katame-waza* were presented in the studies by Sterkowicz et al. [17] and by Maśliński et al. [19]. In order to increase the spectacular and mediagenic aspects of judo, the rules require referees to interrupt all fight downtimes that occur most often in the horizontal position. The application of an efficient *katame-waza* techniques requires more time for preparation. This is the reason underlying the limited popularity of this way of combat settlement. Another reason may be the growing sport level among contestants and the perfection of defence in *ne-waza*. When considering the number of effectively applied techniques and breaking it down into groups, the highest number of effective attacks were made using hand throws (*te-waza*) 27.06% and foot and leg throws (*ashi-waza*) 23.43%. This situation was different in previous years. The analysis of semi-final and final combats during the 1996 Atlanta Olympic Games [20] shows that the *ashi-waza* group held the first position and *te-waza* the second. Sacrifice throws did not enjoy popularity (13.2%), similarly as hip throws (2.97%). Similar phenomenon was noted also at other judo tournaments for men and women [16]. Most combats from the *ne-waza* group, i.e. in the horizontal techniques, were ended by holding. They constituted 11.88% of all combats. A small number of contests ended by *kansetsu-waza* (lock) – 9 combats, and by *shime-waza* (strangulation) – only 2 combats. Most combats ended in the ground were fought in the category of +100 kg, which is compliant with the observation that most combats in *ne-waza* is fought in the heavier weight categories [19]. The techniques used most in the horizontal position were *tate-shiho-gatame* and *kesa-gatame* – deciding in 9 combats. A considerable effectiveness is also ensured by *yoko-shiho-gatame* – 8 combats. Among the 50 techniques ensuring victory during the men's Olympic tournament, the *seoi-nage* throw took the first place – it decided in 25 contests. The second place was taken by the *kata-guruma* technique – 18 combats. The subsequent places in terms of effectiveness were taken by the *kuchiki-taosi* and *uchi-mata* techniques. Despite the fact that the *seoi-nage* throw is a technique with a considerable energy expenditure and burdened with a considerable risk of a counter-attack (the necessity of

turning one's back to the opponent), it is the most effective one. Table 6 presents the most frequently used techniques.

Among the techniques used at the tournament under analysis, the most effective one was the *seoi-nage* throw, which – considering its character (requiring high agility and speed) – was most often applied in the lighter categories: 60 kg – 11 times, +100 kg – only once. The considerable dependence between the body mass and the effectiveness of the technique in a given weight is visible here. This may be an indication for trainers to pay more attention, particularly in lighter categories, to the perfection of defence and counter-attack against this throw. The next techniques most frequently used by contestants were the *kata-guruma* and *kuchiki-taoshi* throws. Their effectiveness and popularity is related to the fact that it is most difficult to perform a counter-action against them if they are applied. Of particular interest is the situation of the *kata-guruma* technique, which from the 28th place during the Barcelona Olympic Games in 1992 moved to the 11th place during the Atlanta Olympic Games in 1996 [22]. This technique took the leading place in all most important completions. During the Beijing Olympic Games in 2008 it took the 3rd place. The next throw characterised by a high effectiveness was the *uchi-mata* throw, which was most often used in the middle categories, i.e. 73 kg, 81 kg and 90 kg. The 100 kg category contestants used 24 different techniques to win. There also was a wide range of techniques used to win in the categories of 66 kg, 81 kg and the heaviest one – +100 kg – 22 techniques in each. Particularly puzzling is the wide range of techniques used in the heaviest weights, where it might seem that the large body mass physically limits the application of certain techniques.

Conclusions

1. Most combats of the men's tournament ended before time and the score awarded most often by referees was *ippon*.
2. The victories were most often awarded in consequence of the *nage-waza* (throwing) techniques rather than the *katame-waza* (grappling) techniques.
3. The *te-waza* (hand) throwing group techniques proved to be dominating.
4. The most frequently used technical element deciding about victory was the *seoi-nage* throw, which was most popular in the lighter categories.
5. The most effective way of winning combats in *ne-waza* (ground) was holding.
6. The most frequent way of awarding victory in extra time (golden score) was *yuko*.

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Received: 30.06.2011

Accepted: 25.07.2012