Journal of Combat Sports and Martial Arts
© MEDSPORTPRESS, 2011; 2(2); Vol. 2, 117-123

Directions of changes of technical and tactical skills by wrestlers free style within 12 years, 1996-2008

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Key words: combat sports, structure of sport contest, wrestling

Summary

Introduction. The main aim of research study was to determine direction of changes in the structure of wrestling matches during three Olympic cycles: from Atlanta 1996 to Beijing 2008. The data collected from freestyle wrestling matches during the "Atlanta" 1996 and "Beijing" 2008 Olympic constituted research material.

Material and methods. A total of 311 matches were analyzed (10 weight categories in the "Atlanta" and 7 weight categories in the "Beijing").

Results and Conclusions. The dominant mode of winning a match in the analyzed tournament was winning on points; after two rounds (68%). However, it should be noted that due increasingly even level of preparedness of the contestants more often third round determines the victor (50% of 60 kg weight category). Analysis of contestants' bout structure, depending on the position of fighting in different weight categories, show significant difference between the lightweight (55 kg, 60 kg, 66 kg) and heavy (74 kg, 84 kg, 96 kg, 120 kg) category. Light weight, compared to heavy weight, was characterized by a smaller number of technical points scored during the fight in the standing position (48-50%) and greater number of technical points scored on the mat (35-41%).

Introduction

In the research studies carried out on wrestlers, we encounter reference to muscle strength [7], relationship between technique used and the physique [2] or the use of motor skills tests to evaluate the state of preparedness of an athlete [10], etc. However, analysis of the structure sport contest at the current level of competitive sport is becoming an extremely important factor, often determining the final success in a sport match. A number of authors have dealt with the phenomenon of combat sports [3,4,6,9]. Nevertheless, analysis of sport contest in wrestling is an issue rarely tackled.

During sport contest, the contestants execute a large number of tactical maneuvers, grips, counter-grips and different combinations aimed at scoring the greatest number of technical points. Successive significant changes in the wrestling regulations have forced contestants and coaches to adapt technical and tactical measures to the demands of new combat situation.

Analysis of wrestling matches in the in the 1996 Atlanta and 2008 Beijing Olympics tournaments was adopted as the main objective of research. This helped determine the dominant technical maneuvers by freestyle style wrestlers and thus determine the directions of changes in these activities.

Material and methods

Records of wrestling matches during Olympic tournament in freestyle wrestling in the "Atlanta" 1996 and "Beijing" 2008 constituted the research material.

A total of 311 matches were analyzed (10 weight categories in 1996 and 7 weight categories in 2008). The tournament was attended by 139 contestants from some 45 countries. The progress of "Beijing 2008" Olympic Games with "crossings" of all the contests in different weight categories and the final competition protocol is available on FILA official website – www.fila-wrestling.com. Materials in the website were used to analyze the matches.

Introduced changes in the wrestling regulations have forced contestants to adopt technical maneuvers that are rated higher by the judges or are tactically more cost-effective. Table 1 presents the main assumptions of the regulato-

ry changes introduced between the analyzed wrestling Olympic tournaments.

Methods of study

Collected materials were processed using statistical methods such as arithmetic mean and percentage index, next they were illustrated and presented in form of graphs. The study also used indicators from the study of structure of judoists combat [1]. These indicators have been adapted for wrestling contests, they are: activity index (WA) and effectiveness index (WAS).

$$WA = \frac{\text{Sum of pts} + 10 \text{ pts per pin}}{\text{number of contest}} \quad WS = \frac{\text{contents won by pin and technical superiority}}{\text{number of contest}}$$

In order to carry out the analysis, worksheets of bout progress and spreadsheets were used, facilitating separation of required contest parameters.

Results

During the Olympic Games in Atlanta wrestling contest regular time was five minutes. A contest could end up in extra time or ahead of time. Most of contests during the tournament ended at regular (5 minutes) – 52%. The rest of the fight contents involved extra time - 25%, and the fight ended prematurely through technical superiority or accumulated points – 22% (Fig. 1).

In Beijing, the assigned time for a match was three two-minutes rounds. Most of matches ended after two rounds, this constituted 68% of all matches. Matches that ended after three rounds constituted 30%, while the least number of wins happened in the first round – only 2%. (Fig. 2).

In respective weight categories at the Atlanta Olympics, the highest number of matches that ended in the regular time was registered by 82 kg weight contestants – 68.4%, at the same time it was the weight class with the least number of

Table 1. Changes in the wrestling regulations between "Atlanta 1996" and "Beijing 2008" wrestling tournaments

	"Atlanta 1996"	"Beijing 2008"
Weight categories	48, 52, 57, 62, 68, 74, 82, 90, 100, 120 kg	55, 60, 66, 74, 84, 97, 120 kg
Bout time	Five minutes	Three two-minutes rounds
Victory conditions	• Pin • Technical superiority • Win by decision	• Pin • Win after two rounds
Technical superiority	Match ends	End of round
Tie	• Tie 0:0 - extra time • Point tie – extra time	• Tie 0:0 – coin toss and clinch • Point tie – possibility of announcing winner of the round
Fleeing-the-mat	No consequence - resumption of the match in the middle of the mat	Loss 1 point
Attach „trolley”	Illegal series of attack	Permissible series of attack
So-called ”clinch”	No	Yes
Forced mat	Yes	No
So-called “fall”	Yes	No
Rule Minimum 3 points	Yes	No

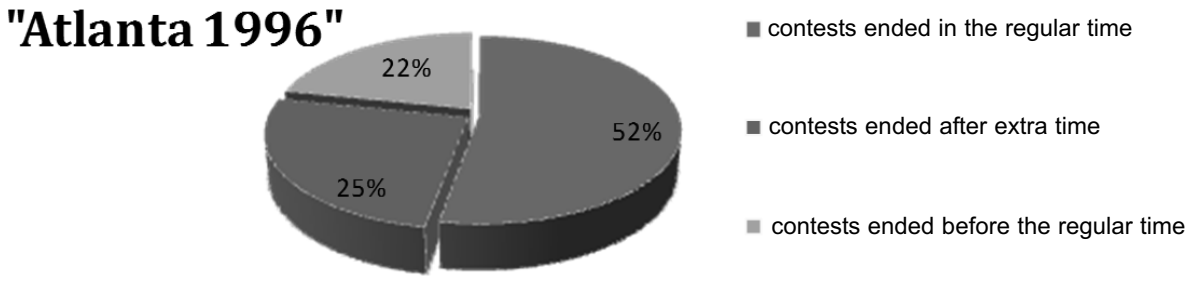

Fig. 1. Characteristics of the ending matches - "Atlanta 1996"

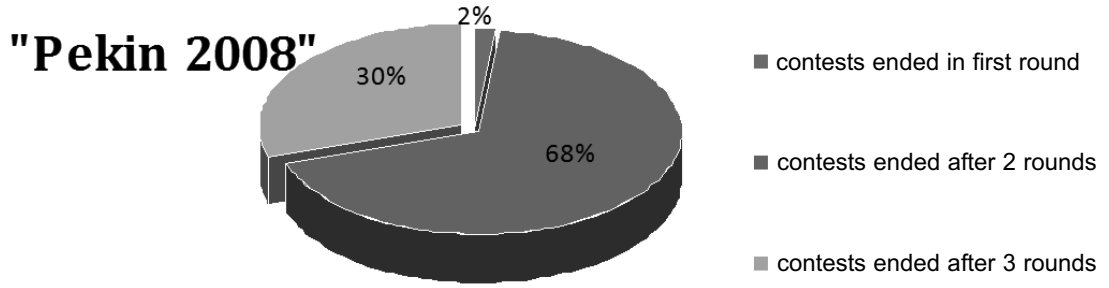

Fig. 2. Characteristics of the end of matches - "Beijing 2008"

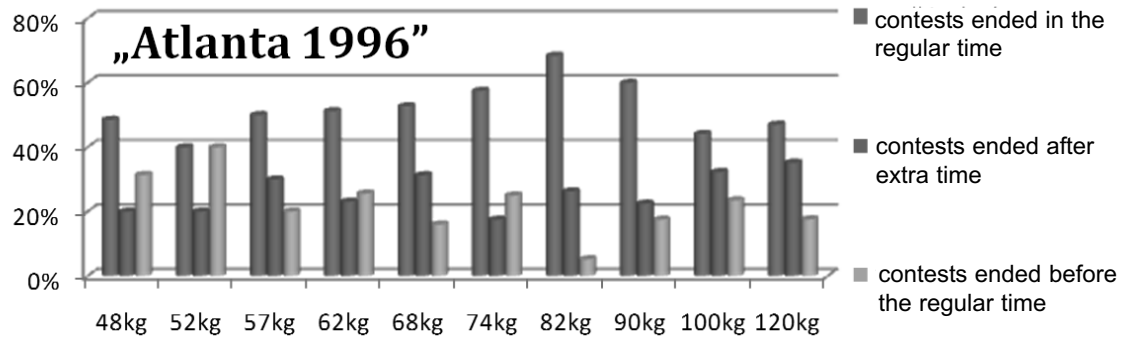

Fig. 3. Characteristics of the end of matches in respective weight categories - "Atlanta 1996"

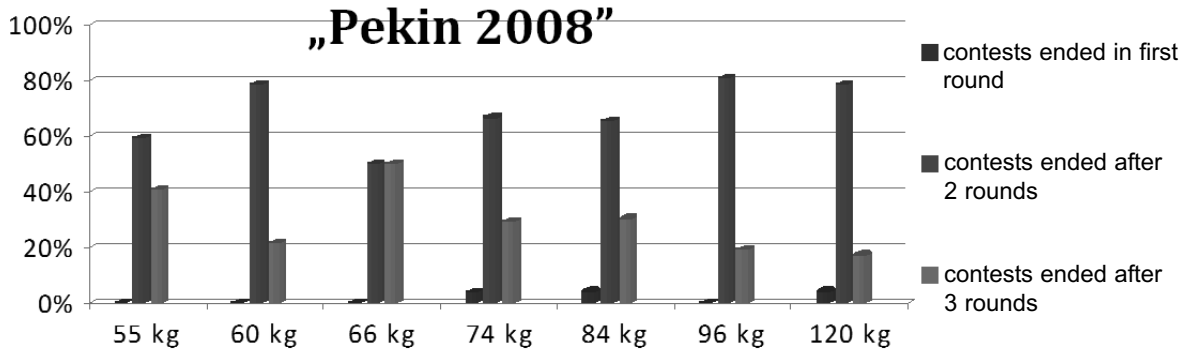

Fig. 4. Characteristics of end of matches in respective weight categories – "Beijing 2008"

matches ending before scheduled time – 2.6%. The weight classes: 57 kg, 68 kg, 100 kg and 120 kg had the highest percent of matches into to extra time. The least number of victors coming just after 5 minutes of contest, hence the highest number of matches ending before scheduled time was registered in the 52 kg weight category – 39% (Fig. 3).

In Beijing, the highest number of matches ending after two rounds was registered in the 60 kg, 96 kg and 120 kg weight categories. The highest number of matches ending after three rounds was registered by weight class below 66 kg, wrestlers from this categories had the least number of matches ending after only two rounds – also 50%. Only three weight categories had matches ending after just the first round: 74 kg, 84 kg and 120 kg, these matches constituted 4% of all victories (Fig. 4).

Comparison of test results highlights the differences in regulation of match time, which contributed substantially to its structure dividing wrestling contest into three rounds. In this connection, the characteristics of the ending of matches in the scheduled time, after extra time, or before the end of schedule match time (Atlanta) as well as the match ending in the 1, 2, or 3rd round (Beijing) also changed. The immediately ending a contest via pin did not change. However, when it comes to technical superiority, these options were different, because in "Atlanta," it ended the whole match, while in "Beijing" it only ended one round. In addition, the regulation of compulsory clinch, which has increased the match by an additional 30 s also contributed to the differences in the time structure. That was the case in more than fifty matches in "Beijing". In addition, almost 30% matches lasted three rounds, which results in six minutes. However, in "Atlanta" the majority of the contests ended after end of five minutes or before.

During the Olympic Games in Atlanta fight lasted five minutes. If there is a tie after regular time additional three-minutes extra time is added. The highest number of technical points was scored in the second and third minute of the fight – in total more than 50%. In the first minute wrestlers scored

more than 15% of points, the same in the fourth – about 16%. The least number of maneuvers was executed in the last minute of the match, and in the extra time (Fig. 5).

In Beijing, wrestling matches were divided into three two-minutes rounds. If neither wrestler had scored a point at the end of a round, a draw 0-0, then a mandatory 30-seconds clinch was used to decide the winner. The highest number of points was scored in the first two rounds of the match – a total of about 80%. In the first round 38% and second 43.4%. Wrestlers scored just 12% in the third round. Actions performed in the clinch position yielded 6.2% of all the points, of which the highest number was in the first round (Fig. 6).

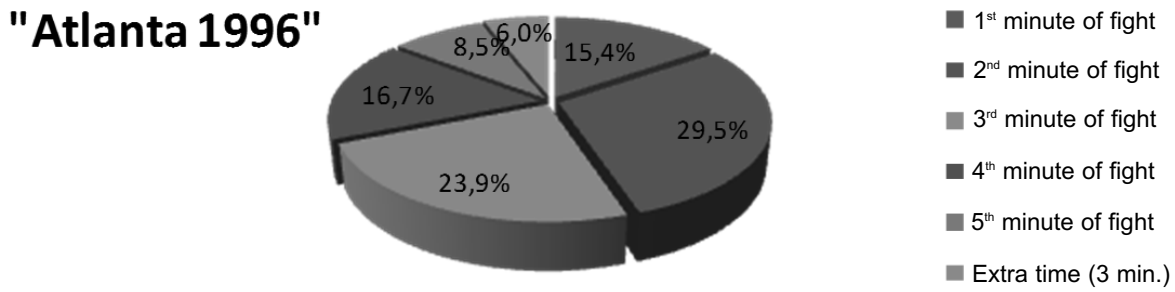

Fig. 5. percentage characteristics of the technical points scored in subsequent minutes of the match – "Atlanta 1996"

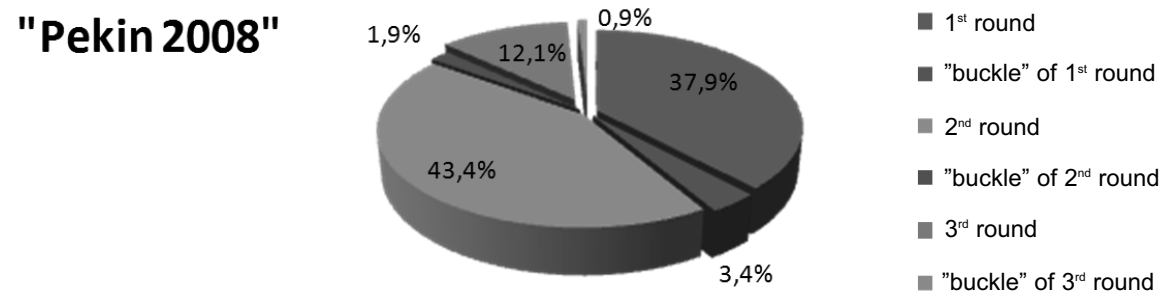

Fig. 6. Percentage characteristics of the technical points scored in subsequent minutes of the match – "Beijing 2008"

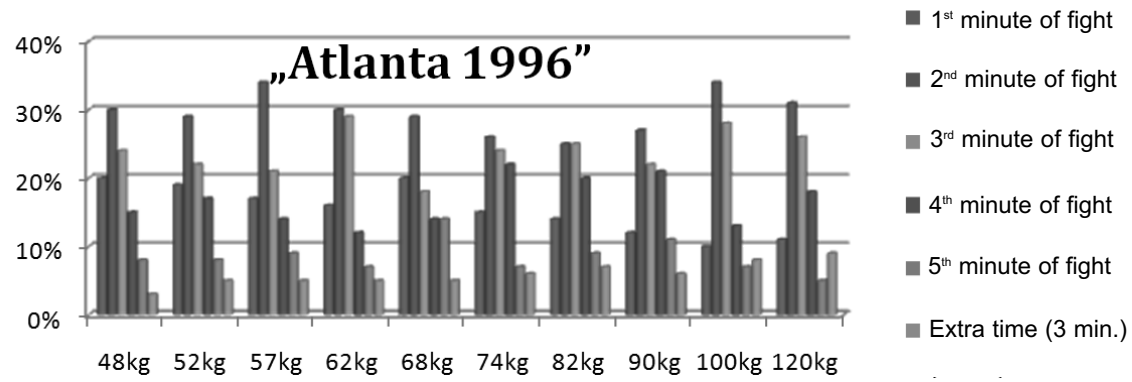

Fig. 7. Percentage characteristics of technical points scored in subsequent rounds of contest in different weight categories – "Atlanta 1996"

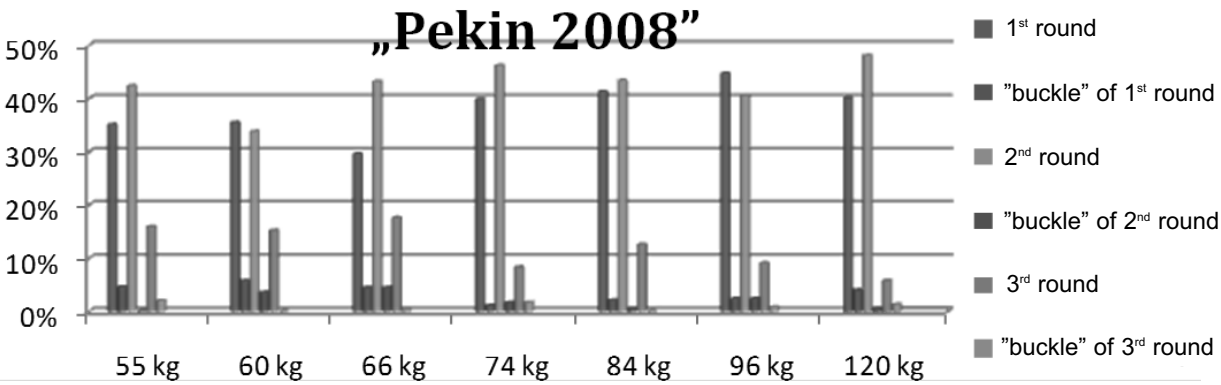

Fig. 8. Percentage characteristics of technical points scored in subsequent rounds of contest in different weight categories – "Beijing 2008"

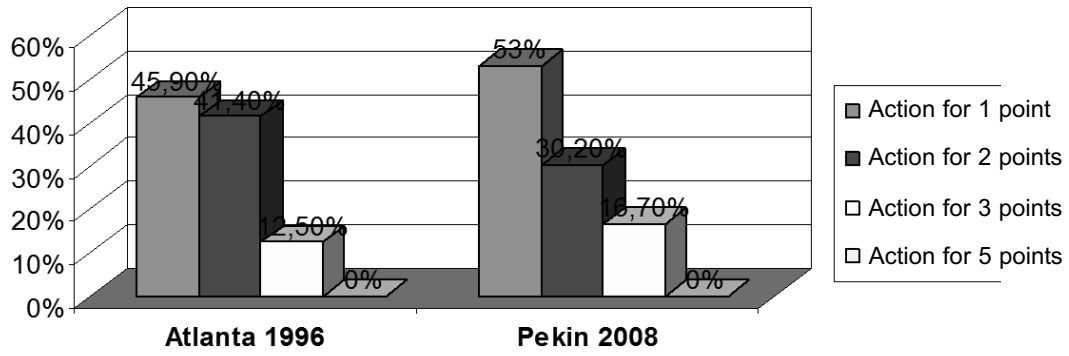

Fig. 9. Percent share of technical actions for 1, 2, 3 and 5 points - "Atlanta 1996" and "Beijing 2008"

In the respective weight classes in Atlanta, 48 kg and 68 kg weight class category wrestlers scored the highest points in the first minute of the match, and the least was scored by 100 kg weight class wrestlers. In the second minute, the highest number of points was registered in the 57 kg and 100 kg weight class category, the lowest in the 82 kg. In the third minute, 62 kg and 100 kg weight class wrestlers scored the highest number points, and 68 kg weight class the least (Fig. 7).

During matches in "Beijing" tournament, 96 kg weight class wrestlers scored the highest points in the first round, while the 66 kg weight class scored the least. In the second round, 120 kg weight class wrestlers scored the highest points and the 60 kg the least. The 96 kg weight contestants executed the highest number of effective technical actions in the last round, and 66 kg weight class contestants the least. In all weight categories, the contestants scored the highest number of technical points during clinch in the first round of match (Fig. 8).

Characteristics of technical actions in terms of scoring

In both tournaments, maneuvers for which the players obtained 1 point constituted the highest number of technical actions. In "Atlanta", they accounted for about 46% of all actions, but had climbed to 53% in " Beijing". The highest number of two-points maneuvers was recorded during competition in "Atlanta" (41.4%). The "Beijing", three-point throws and one-point actions had overtaken the 2-points maneuvers. In both tournaments no 5-points action was registered. (Fig. 9).

In the "Atlanta", in the respective weight categories, the highest number of 1 point maneuvers was registered in the 120 kg category – 60%. The least number of such actions was executed by wrestlers contesting in the three lowest categories: 48 kg, 52 kg and 57 kg – less than 40%. Quite the opposite situation occurred in the case of two point actions, where their number decreased with increasing wrestler's body mass. Analysis of 3 point actions showed a comparable results in all weight categories (Fig. 10).

In Beijing, the highest number of single point actions was recorded in the 96 kg category – 59.3%, and the lowest number in the category 66 kg and 84 kg – 48.8%. Wrestlers contesting in the 60 kg class category executed the highest number of 2 points actions – 40%, however, wrestlers in the 96 kg and 120 kg weight class had the lest (26%). The highest number of 3-points actions were executed by wrestlers in the 66 kg, 84 kg and 120 kg categories (20%), the least number by the 60 kg category wrestlers – 8.6% (Fig. 11).

During wrestling tournament in "Beijing," the highest activity during wrestling matches were attained by middle weight wrestlers (WA = 8.4). Heavyweights recorded the lowest (WA = 6.3). However, during tournament in "Atlanta" lightweight wrestlers were the most active (WA = 8.63).

The highest success rate during "Beijing" tournament was recorded by the heavyweights (WAS = 0.22), the lowest by the lightweights (WAS = 0.13). As for effectiveness of an action in the "Atlanta" tournament, lightweight wrestlers dominated (WAS = 0.3).

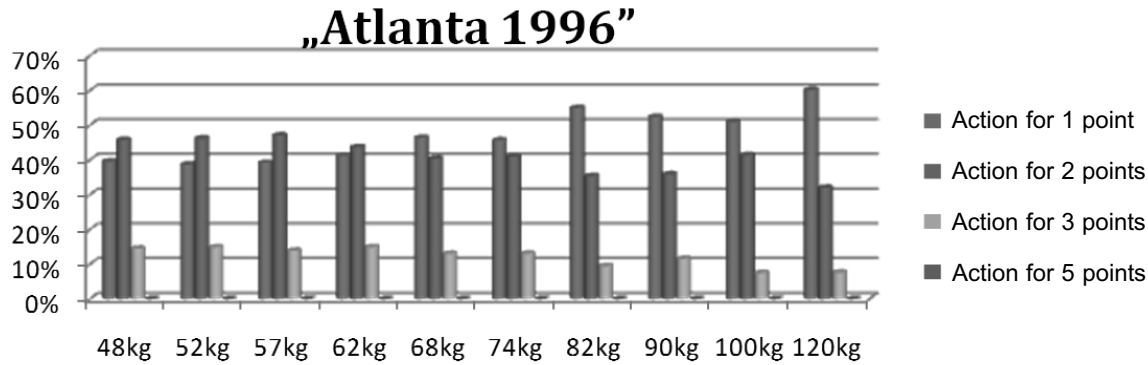

Fig. 10. Percent share of technical actions for 1, 2, 3 and 5 points. in different weight categories - "Atlanta 1996"

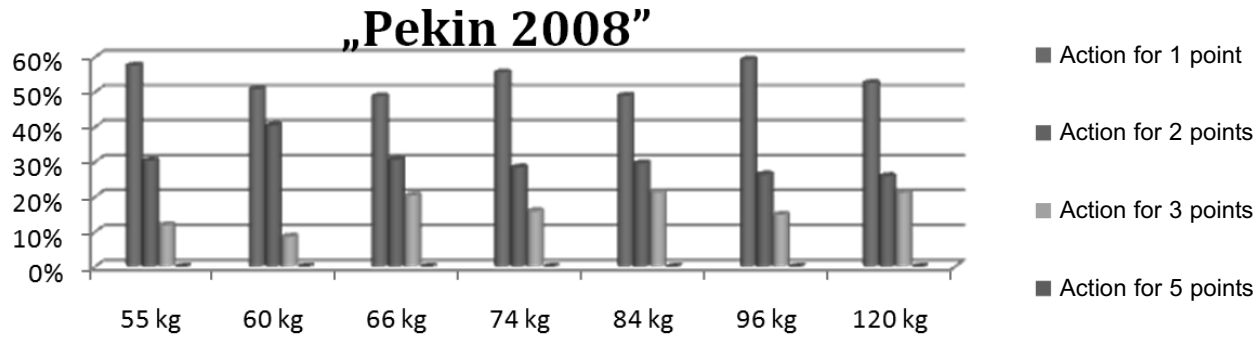

Fig. 11. Percent share of technical actions for 1, 2, 3 and 5 points. in different weight categories - "Beijing 2008"

Table 2. Values of the structure of contents, WA activity and WS - effectiveness

	I.O. ATLANTA 1996			I.O. PEKIN 2004		
	Lightweight	Middleweight	Heavyweight	Lightweight	Middleweight	Heavyweight
Activity indicator WA	8.63	7.35	6.46	7.05	8.4	6.9
Success rate WS	0.3	0.15	0.2	0.13	0.166	0.22

Discussion

Olympic tournament undoubtedly is the most important sporting event for which an athlete has to prepare. Another indisputable fact is that the best players attended the tournament, so we can assume that analysis of fighting during this tournament is a reflection of the major trends and evolution of technical and tactical actions of athletes from different weight classes.

The analysis carried out shows that matches were mainly resolved after two rounds (68%), except of the weight class category in which 50% of fights ended in the second round and the same number (50%) in the third round. This indicates a very even level of technical preparation of wrestlers of this weight class.

Analysis of the number of technical points scored, depending on the fight position, indicates a greater number of technical points scored in standing position (57.6%), compared to 35.6% scored on the mat. Analysis of the number of points scored in each weight class category show difference between the lightweight class category (55 kg, 60 kg, 66 kg) and heavyweight (74 kg, 84 kg, 96 kg, 120 kg). The lightweight class categories, compared to the heavyweight division, has been characterized by a smaller number of technical points scored during the fight in the standing position (48-50%) and greater number of technical points scored in wrestling on the mat (35-41%).

Franchini and Sterkowicz in their research studies on judoists came to similar conclusion [8]. By analyzing contents judoists in the period 1995-1999, they noticed that lightweight judoists were significantly more likely to decide on technical move (64.76%) than the heavyweights. The dominating actions on the mat (75% of technical points) among athletes participating in the Olympic tournament in women's wrestling has been pointed out by Kruszewski and colleagues [5], however, in this case, there is no difference between different weight classes. The apparent difference points to the need for a different technical and tactical preparation for lightweight wrestlers, aimed at improving technical elements for bouts executed on the mat, than for the heavyweights.

The listed indicators of structure of bouts show big diversity of technical and tactical preparation within each category of weight. In the case of 60 kg class category, they affirm previous observations. Low level of activity index points to the fact that wrestlers of this weight class did not take the risks of executing of technical actions (lower activity index rate – 6.4), and the actions undertaken were often ineffective (lower success rate – 0.08). Totally different structure of 84 kg weight wrestlers. Athletes in these category more often tried to execute technical moves (higher activity rate - 8.8) and the undertaken action more often resulted technical points (a higher success rate – 0.28).

Conclusions

1. The dominant means of wining a tournament in the analyzed victory on points: after 5 minutes bout (Atlanta 1996) or after two rounds (Beijing 2008).
2. Comparable level of skills and preparedness by athletes has meant that increasingly the third round determines the victor (50% of 60 kg weight class wrestlers during the tournament in Beijing 2008). This requires that players pay special attention to proper endurance preparation.
3. Analysis of the structure of wrestling of the athletes players fight, depending on the position of fighting, shows difference in the light (55 kg, 60 kg, 66 kg) and heavy weight classes categories (74 kg, 84 kg, 96 kg, 120 kg). Light weight class categories, as distinct from the heavy weight class categories, is characterized by a smaller number of technical points scored during fighting in the standing position (48-50%) and greater number of technical points scored during fighting on the mat position (35-41%). This points to the need for different training for the lightweight and different for the heavyweight athletes, more training work in a standing position for the lightweights, more training in the mat position for the heavyweight.

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Received: 22.05.2011
Accepted: 13.09.2011