

The evolution of performance metrics in the competitive arena of freestyle wrestling olympic finalists

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Abstract

Objective of the study was to examine the evolution of performance metrics for wrestlers in the discipline of freestyle wrestling at the Olympic Games, both before and after the rule modifications implemented in 2013.

Methods and structure of the study. The following methods were used in the work: analysis of scientific and methodological literature, video analysis and timing of competitive duels for first and third places in each weight category at the Olympic Games in Paris (2024) in men's wrestling (discipline – freestyle wrestling), methods of mathematical statistics.

Results and conclusions. In the research, we calculated specific metrics for the performance of the finalists in the wrestling competition at the Beijing Olympics (2024). These metrics included the average duration of each bout, the average time spent in the standing and clinching positions, activity, effectiveness, the number of high-scoring moves, and the reliability of the wrestler's offensive and defensive strategies. We then compared these findings with the results of our previous studies, which analyzed the performance of wrestlers at the Olympic Games in Atlanta (1996) and Sydney (2000).

A comparative study revealed that the alterations in the rules governing competition in 2013 had a substantial effect on the performance of competitive activities, resulting in a shift towards enhancing the entertainment value of competitive matches. Specifically, the average duration of fights decreased due to an increase in the number of early victories. The intensity and overall effectiveness of the fights increased approximately twofold. The reliability of offensive actions decreased, while defensive actions increased. The proportion of high-scoring TTA remained relatively stable.

Keywords: *Olympic Games, freestyle wrestling, competitive activity.*

Introduction. One of the main criteria for inclusion and preservation of a sport in the Olympic Games program, along with popularity, attractiveness for young people and advertisers, is entertainment value. Entertainment value in wrestling is understood as the general accessibility and simplicity of perception of combat by spectators, active performance by athletes of effective, impressive, delightful, diverse, highly valued, effective technical and tactical actions [2, 6]. Based on this definition, entertainment value can be quantitatively assessed by the following indicators of competitive activity: activity - the number of real attacks (assessed and unassessed) carried out by an athlete per unit of time, effectiveness - the number of points won by an athlete per unit of time, (high-scoring) - the

share of high-scoring TTA in the total number of assessed TTA. The International Federation of Unified Wrestling Styles (UWW) constantly makes changes to the points of the competition rules in order to increase the spectacle and objectivity of the evaluation of competitive fights, which significantly affects the indicators of competitive activity, which, in turn, determine the directions for correcting the training methods [1, 5]. These attempts were most active in the period from 1996 to 2013, the rules changed almost every Olympic cycle. The total time of the fight, the number of periods, the scores for the technical and tactical actions (TTA), the punishment for passive wrestling, etc. were adjusted. In 2013, the rules underwent significant changes, and since then only minor amendments



have been made to date. At the same time, the question remains relevant: has UWW managed to increase the spectacle of the fights; have the quantitative indicators of the competitive activity of wrestlers at the Olympic Games changed.

Objective of the study was to examine the evolution of performance metrics for wrestlers in the discipline of freestyle wrestling at the Olympic Games, both before and after the rule modifications implemented in 2013.

Methods and structure of the study. The following methods were used in the work: analysis of scientific and methodological literature, video analysis and timing of fights for first and third places in each weight category at the Olympic Games in Paris (2024) in men's wrestling (discipline - freestyle wrestling), methods of mathematical statistics. At the beginning of the study, a video analysis of competitive fights at the Olympic Games in Paris (2024) was conducted, on the basis of which the following indicators of the competitive activity of wrestlers were calculated: average bout time, average time of wrestling in a standing position and on the ground separately; activity, overall performance, as well as performance in wrestling in a standing position and on the ground separately, high-scoring, reliability of the wrestler's attack and defense. Then the obtained data were compared with the results of our previous studies on the analysis of the competitive activity of wrestlers at the Olympic Games in Atlanta (1996) and Sydney (2000) [3, 4]. At the end of the work, the conclusions of the study were formulated.

Results of the study and discussion. The table presents the calculated indicators of the competitive activity of wrestlers (discipline - freestyle wrestling) in the final fights for first and third places at the Olympics in Atlanta (1996), Sydney (2000) and Paris (2024).

The table shows that the number of weight categories decreases from Olympics to Olympics, while the number of fights for medals remains at the same level. This is due to the fact that women's competitions were introduced into the Olympic Games program in 2004, due to the reduction of weight categories for men, and the fact that since 2008 two bronze medals have been played out in each weight category. The average time of a fight in Paris has significantly decreased: by 23 seconds compared to Atlanta and by 30 seconds compared to Sydney due to early, bright victories, which indicates an increase in the spectacle of even the final fights, in which wrestlers prefer to act more reliably, avoiding increased risk. It is interesting to note that the ratio of time spent fighting in a standing position to time spent fighting on the ground has increased fourfold from 1,63 in Atlanta (1996) and 1,62 in Sydney (2000) to 6.5 in Paris (2024). In a standing position, the athletes in Paris performed 82 techniques, which were rated by the judges at 139 points, while in Atlanta and Sydney these values are 65/82 and 49/66, respectively, with a comparable number of fights. These data allow us to calculate the effectiveness of fighting in a standing position, which in Paris is 0,82 points per minute, versus 0,57 and 0,56 in Atlanta and Sydney. An even more significant increase in the effectiveness

Performance indicators of wrestlers in the final bouts for first and third place at the Olympic Games in Atlanta (1996), Sydney (2000) and Paris (2024)

Indicators	Atlanta 1996	Sydney 2000	Paris 2004
Number of weight categories	10	8	6
Number of fights for medals	20	16	18
Average contraction time	5 min 50 sec	5 min 57sec	5 min 27sec
Average time of fighting in a standing position, %	62	61,9	86,5
Average time of fighting on the ground, %	38	38,1	13,3
Number of assessed techniques in a standing position	65	49	82
Number of points won in the rack	82	66	139
Number of assessed techniques on the ground	11	18	23
Number of points won in the ground game	20	29	45
Activity	-	-	1,11
The effectiveness of the fight	0,44	0,50	0,94
Efficiency of standing fight	0,57	0,56	0,82
Effectiveness of ground fighting	0,23	0,4	1,71
Attack reliability, %	57	65	43
Security reliability, %	43	35	57
High score, %	6,6	4,4	5,7



of fighting is observed on the ground. Thus, in Paris (2024) this indicator is 1,71 points per minute, while in Atlanta (1996) and Sydney (2000) it is 0,23 and 0,4, respectively, which is 7,4 and 4,3 times more. Calculation of the overall efficiency for the entire fight shows that it increased in Paris, compared to Atlanta and Sydney, by 2,13 and 1,88 times, respectively. These results indicate a significant increase in one of the main indicators of entertainment – efficiency.

Activity, also one of the significant performance indicators, was not calculated at the Atlanta and Sydney Olympics. At the same time, it can be argued that activity in Paris increased more than efficiency, since these indicators are quite tightly linked through attack reliability, and at the last Olympics this indicator (attack reliability) noticeably decreased, which means activity grew faster than efficiency. It should be noted that defense reliability at the Paris Olympics increased significantly: by 14% compared to Atlanta and by 22% compared to Paris. This is probably explained by the fact that recently special attention has been paid to defense in the best teams and, especially, to counterattacks, which is confirmed by the increase in the share of counter-techniques in the composition of TTA performed by high-class athletes. In conclusion, let us move on to the analysis of such an entertainment indicator as high-scoring. The table shows that its value at the Paris Olympics is approximately equal to the arithmetic mean of the high-scoring values of the previous Olympics. This suggests that all the rule changes did not affect this indicator. It can be assumed that with a significant increase in the reliability of protection, athletes prefer more reliable, albeit less evaluated TTA, especially in the final fights at the Olympic Games.

Conclusions. A comparative analysis of the competitive activity of wrestlers – finalists of the Atlanta (1996), Sydney (2000), Paris (2024) Olympics (discipline – freestyle wrestling) showed that the changes in the 2013 competition rules significantly changed its indicators towards increasing the spectacle of competitive fights. The average time of a fight in Paris decreased: by 23 seconds, compared to Atlanta and by 30 seconds, compared to Sydney, due to the increase

in the number of early victories. The activity and overall effectiveness of the fight increased approximately twofold. The reliability of attacking actions decreased by 14%, compared to Atlanta, and by 22%, compared to Sydney, the reliability of defensive ones increased by the same values. At the same time, the share of high-scoring TTA remained approximately at the same level, which suggests that UWW has not been able to solve this separate problem to date.

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