

## KINESIOLOGY & COACHING

MYKOLA LATYSHEV<sup>1(CDEF)</sup>, YRUI TROPIN<sup>2(CDEF)</sup>, OLEKSANDR PRYIMAKOV<sup>3(DEF)</sup>,  
DAVID CURBY<sup>4(BDE)</sup>, MILORAD DOKMANAC<sup>5(BDE)</sup>, MARIO BAIC<sup>6(ADEF)</sup>,  
GEORGIY KOROBAYNIKOV<sup>7(ADEF)</sup>, FIKRAT KERIMOV<sup>8(ADEF)</sup>,  
ABDULAZIZ KHAMIDJONOV<sup>9(AEF)</sup>, MIRZOHID MIRZOLIM<sup>10(ADF)</sup>

1 ORCID: 0000-0001-9345-2759

Department of Physical Education and Pedagogy of Sport, Borys Grinchenko Kyiv Metropolitan University, Kyiv (Ukraine);

Department of Combat Sports and Power Sports, National University of Ukraine on Physical Education and Sport, Kyiv (Ukraine)

2 ORCID: 0000-0002-6691-2470

Department of Martial Arts, Kharkiv State Academy of Physical Culture, Kharkiv (Ukraine)

3 ORCID: 0000-0003-0351-486X

Faculty of Physical Culture and Health Promotion, Szczecin University, Szczecin (Poland); Faculty of Physical Culture and Health,  
Mykhailo Drahomanov Ukrainian State University, Kyiv (Ukraine)

4 ORCID: 0000-0003-1170-4583

International Network of Wrestling Researchers, Chicago (USA)

5 ORCID: 0000-0003-0097-3534

Sports Department, Sports Academy, Belgrade (Serbia)

6 ORCID: 0000-0003-0581-0590

Faculty at Faculty of Kinesiology, University of Zagreb, Zagreb (Croatia)

7 ORCID: 0000-0002-1097-4787

Department of Theory and Methodology of International Wrestling, Uzbek State University of Physical Culture and Sport, Tashkent region, Chirchik (Uzbekistan);

Department of Combat Sports and Power Sports, National University of Ukraine on Physical Education and Sport, Kyiv (Ukraine);

Institute of Psychology, German Sport University Cologne, Cologne (Germany)

8 ORCID: 0000-0002-1688-9196

Scientific Research Institute of Physical Culture and Sport, Tashkent region, Chirchik (Uzbekistan)

9 ORCID: 0009-0005-2636-3584

Scientific Research Institute of Physical Culture and Sport, Tashkent region, Chirchik (Uzbekistan)

10 ORCID: 0009-0008-3838-8278

Scientific Research Institute of Physical Culture and Sport, Tashkent region, Chirchik (Uzbekistan)

Corresponding Author: Georgiy Korobaynikov

e-mail: k.george.65.w@gmail.com

## Greco-Roman Wrestling on the World Stage: Performance Trends and Country Comparisons

Submission: 10.05.2024; acceptance: 18.06.2024

---

**For citation** – in IPA style:

Latyshev M., Tropin Y., Pryimakov O., Curby D., Dokmanac M., Baic M., Korobaynikov G., Kerimov F., Khamidjonov A., Mirzolim M. (2024), *Greco-Roman Wrestling on the World Stage: Performance Trends and Country Comparisons*, “Ido Movement for Culture Journal of Martial Arts Anthropology”, vol. 24, no. 4, pp. 33–39; doi: 10.14589/ido.24.4.5.

In other standard – e.g.:

Latyshev, M., Tropin, Y., Pryimakov, O., Curby, D., Dokmanac, M., Baic, M., Korobaynikov, G., Kerimov, F., Khamidjonov, A., Mirzolim, M. Greco-Roman Wrestling on the World Stage: Performance Trends and Country Comparisons. *Ido Mov Cult J Martial Arts Anthropol*, 2024, 24 (4): 33–39 DOI: 10.14589/ido.24.4.5

---

**Key words:** Greco-Roman wrestling, Olympic Games, performance analysis, success index, world championship

### Abstract

**Background.** The Olympic Games represent the greatest sporting event, uniting athletes from around the world in the spirit of competition, achievement, and unity. The 2023 World Championship serves as the primary qualifier for the 2024 Olympic Games, providing critical data on the technical and strategic performance of elite wrestlers.

**Problem.** The Study Aim is to identify key aspects of the best-ranked teams at the 2023 Greco-Roman Wrestling World Championship and to conduct a comparative analysis.

**Methods.** This study analyzed 271 matches involving 86 wrestlers from 10 countries using the Performance Data Analysis platform by United World Wrestling. Key performance indicators such as match duration, number of actions in standing and parterre positions, and success indices were calculated.

**Results.** Performance indicators revealed preferences for standing and parterre positions, with teams like Cuba and France scoring highest on the Most Successful Wrestler Index at 2.69 and 1.92, respectively. Notably, actions like gut wrench, step out, lifts, and take down represented over 70% of all actions. Statistical analysis confirmed significant differences in parterre actions among wrestlers from Azerbaijan, Turkey, Georgia, and Armenia.

**Conclusions.** The study underscores the complexity of tactical preferences that influence team performance at world championships. The findings underscore the pivotal role of advanced analytics in enhancing understanding and strategic planning in competitive wrestling. The success index metrics, while associated with teams' rankings and Olympic qualification, do not fully capture the extent of their achievements.

### Introduction

The Olympic Games represent the greatest sporting event, uniting athletes from around the world in the spirit of competition, achievement, and unity. Their history spans millennia and serves as an exemplar of harmony between physical and spiritual human development [Koenigstorfer, Preuss 2018; Kruszewski 2023; Matkarimov *et al.* 2024]. Held every four years, the Olympic Games provide an arena where the world's finest athletes meet, competing for the title of champion in various sports. The years of extensive preparation by elite athletes are directed towards participation and winning medals at the Olympics [Franchini, Takito 2014; Smith-Ditizio, Smith 2023; Tropin *et al.* 2023]. Meanwhile, wrestling remains one of the oldest and most prestigious disciplines in the world of sports, captivating the attention of millions of fans and participants globally [Malloy 2020; Telles, Machado 2022; Curby *et al.* 2023].

The first qualifying competition for athletes in Greco-Roman wrestling for the upcoming 2024 Olympic Games was the 2023 World Championship. Analyzing the performances of wrestlers at high-level competitions will allow for a deeper understanding of the modern state of Greco-Roman wrestling and will improve further development of this sport [Romanenko *et al.* 2020; Baginska *et al.* 2022].

The performance of a national team competing at this level is an important element of the preparation of the entire team of specialists and demonstrates the level of development of this sport in the country [Curby, Jomand 2015; Koenigstorfer, Preuss 2018]. It serves as an indicator of the entire process of athlete's preparation system in a specific sport and can be used for further analysis. Experts can subsequently conduct analysis,

based on which they can adopt the experience of the most effective training systems [Kruszewski *et al.* 2012; Latyshev *et al.* 2019].

Similar studies are conducted across various sports, identifying contemporary trends in sports development [Forrest *et al.* 2017; Kovacs *et al.* 2017]. These studies examined different aspects that influence the overall performance of national teams [Salcinovic *et al.* 2022]. Importantly, such analyses reveal the main trends in the development of sports in general and specifically in each country. Comparable research has a long history associated with analyzing results from major competitions or critical moments in sports development (for example, discussions about the exclusion of wrestling from the Olympic program). Experts have conducted analyses of team performances determined at world championships and Olympics, conducted comparative analyses of a specific country with others, and comparative analyses between different styles of wrestling. However, in recent years, no studies have been identified showing the trends of top countries and their achievements comparatively.

**Study Aim:** to identify key aspects of top-ranked teams at the 2023 Greco-Roman Wrestling World Championship and to conduct a comparative analysis.

### Material and methods

#### Participants

The study involved 86 Greco-Roman wrestlers from 10 countries, who ranked from first to tenth place in the unofficial medal tally at the 2023 World Championships in Belgrade, Serbia. The performance data were obtained from the official website of the international wrestling

federation, United World Wrestling ([unitedworldwrestling.org](http://unitedworldwrestling.org)).

An analysis was conducted on 271 matches involving wrestlers from the top-10 countries at the 2023 World Championships: Azerbaijan – 36 matches (10 wrestlers), Cuba – 20 matches (6 wrestlers), Kyrgyzstan – 21 matches (7 wrestlers), Iran – 36 matches (10 wrestlers), Turkey – 29 matches (10 wrestlers), Hungary – 24 matches (8 wrestlers), Georgia – 28 matches (10 wrestlers), France – 18 matches (5 wrestlers), Armenia – 33 matches (10 wrestlers), and Japan – 26 matches (10 wrestlers).

*Procedure*

The analysis of wrestler performance was conducted using the interactive platform ‘Performance Data Analysis’, which is utilized by the International Wrestling Federation UWW and has been presented in previous studies [Dokmanac, Slacanac 2018; Roklicer *et al.* 2020].

For the analysis of wrestler performance metrics, the following indicators were utilized: match duration; number of actions performed in standing and parterre positions; number of matches won by fall; number of rule violations in standing and parterre positions separately (standing caution and parterre caution); number of penalties for passive wrestling (activity time); number of challenges in standing and parterre positions (standing challenge and parterre challenge); effectiveness of wrestlers – average number of points scored and lost per minute of the match or success index (WQ); average number of points scored and lost per match for qualification points (CP); and the Most Successful Wrestler (MSW) Index was calculated as the sum of the WQ and CP.

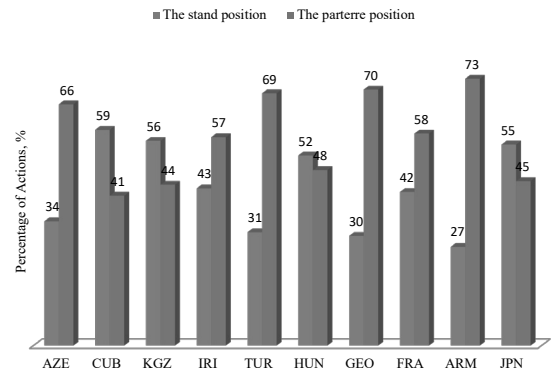
*Statistical analysis*

Statistical analysis was performed using spreadsheet Excel, as well as Python and mathematical computation libraries. Descriptive statistics were utilized to summarize all performance metrics. To assess the significance of the differences between the teams’ performance metrics, the U Mann-Whitney Test was applied where appropriate. A significance level of  $p < 0.05$  was set to determine statistical significance.

**Results**

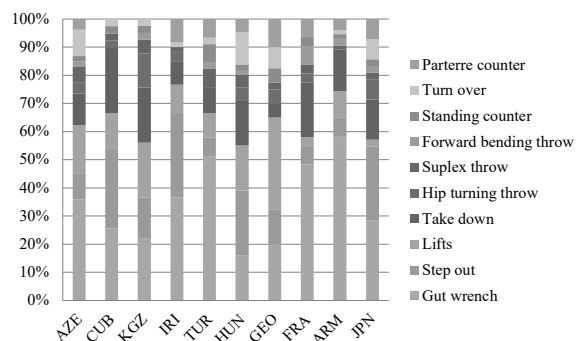
An analysis of matches involving wrestlers from the top-10 teams at the 2023 World Championship revealed that athletes from different countries perform varying numbers of actions in the standing and parterre positions. Representatives from Cuba, Kyrgyzstan, Hungary, and Japan prefer to execute more actions in the standing position. Conversely, wrestlers from Azerbaijan, Iran, Turkey, Georgia, France, and Armenia engage more in parterre actions. This variation can be attributed to the tactical differences in match strategies among athletes from various

countries (Figure 1). There is a statistically significant difference between the metrics for wrestlers from Azerbaijan, Turkey, Georgia, and Armenia ( $p < 0.05$ ).



**Figure 1.** The Percentage of Actions in Standing and Parterre Positions

Figure 2 illustrates the percentage breakdown of actions performed by wrestlers from different countries. Differences are observed in the technical-tactical actions of wrestlers from each country: wrestlers from Kyrgyzstan executed a greater proportion of high-scoring maneuvers in the standing position (19.5% of all actions) such as hip turning throw, suplex throw, and forward bending throw, while athletes from Georgia performed a greater number of high-scoring techniques on the parterre (32.5%), including lifts. Representatives from Cuba, Iran, and Japan engaged in numerous basic standing techniques (take down, step out). Wrestlers from Armenia, Turkey, France, and Azerbaijan executed a substantial volume of basic actions on the parterre (gut wrench).



**Figure 2.** Comparative Analysis of Wrestling Actions by Country in Percentages

It is also noteworthy that only four types of actions (gut wrench, step out, lifts, and take downs) accounted for more than 70% of all executed actions for all wrestlers. For certain teams (Cuba and Armenia), these actions accounted for approximately 90% of all actions. Table 1 presents averaged success data for wrestlers from the top-10 countries. These indices reflect activity, effectiveness, and spectator appeal. The more actions a wrestler performs during a match (making the match more spectacular), the higher the success index.

**Table 1.** Summary of Performance Indices and Match Durations for Top 10 National Wrestling Teams at the 2023 World Championship

Rank	Team	Mean of match duration (min: sec)	The number of matches/wrestlers	WQ Win	WQ Lost	WQ Diff	CP Win	CP Lost	CP Diff	MSW Index
1	AZE	5:19	36 / 10	0.84	0.41	<b>0.43</b>	2.50	1.39	<b>1.11</b>	<b>1.54</b>
2	CUB	4:52	20 / 6	1.00	0.36	<b>0.64</b>	3.15	1.10	<b>2.05</b>	<b>2.69</b>
3	KGZ	4:25	21 / 7	1.29	0.78	<b>0.51</b>	2.67	1.43	<b>1.24</b>	<b>1.75</b>
4	IRI	5:29	36 / 10	0.79	0.49	<b>0.30</b>	2.53	1.39	<b>1.14</b>	<b>1.44</b>
5	TUR	5:03	29 / 10	0.90	0.53	<b>0.37</b>	2.48	1.52	<b>0.96</b>	<b>1.33</b>
6	HUN	5:12	24 / 8	0.99	0.50	<b>0.49</b>	2.46	1.46	<b>1.00</b>	<b>1.49</b>
7	GEO	5:29	28 / 10	0.84	0.49	<b>0.35</b>	2.29	1.82	<b>0.47</b>	<b>0.82</b>
8	FRA	4:51	18 / 5	1.07	0.54	<b>0.53</b>	2.61	1.22	<b>1.39</b>	<b>1.92</b>
9	ARM	4:41	33 / 10	1.19	0.60	<b>0.59</b>	2.52	1.61	<b>0.91</b>	<b>1.50</b>
10	JPN	4:54	26 / 10	0.81	0.62	<b>0.19</b>	2.08	1.85	<b>0.23</b>	<b>0.42</b>

**Note:** WQ (success index) – average number of points scored (win) and lost per minute of the match, CP – average number of points scored (win) and lost per match for qualification points, MSW – the Most Successful Wrestler Index was calculated as the sum of the WQ and CP.

The highest success indices are found among athletes from Kyrgyzstan (1.29) and Armenia (1.19), with the best indices for points lost observed in teams from Cuba (0.36) and Azerbaijan (0.41). The greatest differential between points won and lost is seen in athletes from Cuba (0.64), Armenia (0.59), France (0.53), and Kyrgyzstan (0.51). Considering the success index of qualification points per match, the best outcomes are recorded for teams from Cuba (2.05) and France (1.39). Consequently, the overall Most Successful Wrestler Index was also highest for athletes from Cuba (2.69) and France (1.92); it was lowest for wrestlers from Japan (0.42) and Georgia (0.82).

Additionally, we examined the number of non-standard situations (activity time, negative wrestling, standing challenge, parterre challenge, standing caution, parterre caution) and the points awarded for these actions. A substantial proportion of points was obtained from these non-standard situations: Azerbaijan (27.2% of all points won), Cuba (22.7%), Kyrgyzstan (18.6%), Iran (29.5%), Turkey (26.0%), Hungary (20.2%), Georgia (20.2%), France (29.4%), Armenia (16.4%), and Japan (23.3%). The frequency of these situations influenced the overall spectacle of the match: the more such situations occur, the less spectacular the wrestling tends to be.

In addition, the wrestling spectacle was negatively affected by matches that ended with a score of 1:1. In these matches, the winner was the athlete who scored the last point of the match (most of these matches lack active actions, and points are awarded for passivity). Such matches accounted for 5.2% (n=14) of all matches.

Following the results of the 2023 World Championship, the following investigated teams earned licenses (the number of athletes qualified for the Olympic Games) to compete in the 2024 Olympic Games: Iran – 4 (out of 6 participants, 66.7%); Cuba – 3 (out of 6 participants, 50.0%) and Armenia – 3 (out of 6 participants, 50.0%)

each; Azerbaijan – 2 (out of 6 participants, 33.3%), Kyrgyzstan – 2 (out of 5 participants, 40.0%), Turkey – 2 (out of 6 participants, 33.3%), Japan – 2 (out of 6 participants, 33.3%); Hungary – 1 (out of 5 participants, 20.0%); France (3 participants) and Georgia (6 participants) did not obtain any licenses.

## Discussion

The study presents an analysis of the performance metrics of wrestling teams at the 2023 World Championship. The analysis of wrestler activities is an important research, with a significant number of scientific studies dedicated to it: researchers have studied the effectiveness and technical structure of champions by scoring according to types of techniques [Tunemann, Curby 2016]; assessed the impact of rule changes on match profiles [Janowski et al. 2021]; developed models of the world's elite athletes [Tropin et al. 2022]; refined the training process and experimentally substantiated the structure of annual preparation [Strelchuk et al. 2022]; studied the relationship between brain functional asymmetry and tactical strategies during competitions [Korobeinikova et al. 2020]; and identified pathways for the development of athletes' sports careers and achievements [Latyshev et al. 2019].

Key aspects of the technical-tactical arsenal of the world's top ranked teams in Greco-Roman wrestling were identified. Commonalities include that representatives from all countries performing a large number of technical-tactical actions: in the standing position – take down (ranging from 5.0% to 23.1%), step out (from 6.5% to 30.0%) and in the parterre – gut wrench (from 15.9% to 58.1%). It is noteworthy that four types of actions account for over 70% of all actions by the elite wrestlers. Such results have been obtained previously [Pashkov et al. 2021; Vasilescu et al. 2023]. A high

percentage of successful actions is observed among representatives from Kyrgyzstan and Georgia. It was also established that the percentage ratio of actions performed in standing and parterre positions varies among wrestlers from all national teams investigated. Previous research has identified differences in activity indicators between Greco-Roman wrestlers of different weight categories [Soyguden, Imamoglu 2017] and at competitions of different levels [Aquino *et al.* 2023].

It has been demonstrated that frequent interruptions (challenge, negative wrestling, and caution) occur during matches, which can be regarded as an indirect indicator of the diminished spectator appeal of Greco-Roman wrestling. Another factor adversely affecting the spectacle of Greco-Roman wrestling is the high frequency of penalties for passive behavior (passivity) of one of the athletes. This may serve as a signal for further efforts to enhance the spectacle of wrestling by implementing changes to the competition rules [Vasilescu *et al.* 2023]. These findings align with results from previous research [Dokmanac, Slacanac 2018; Matkarimov *et al.* 2024].

It is worth noting the issue of wrestler migration, as this process affects a country's achievements on the international stage [Forrest *et al.* 2017; Jansen, Engbersen 2017]. The analysis showed that only two athletes were migrants (having changed the country they represent in international competitions; migration before international competitions was not considered), accounting for 0.5% of all athletes. It is also noteworthy that these migrant wrestlers did not earn any licenses.

The last and most crucial finding is that the success index metrics, although associated with the team's placement in the unofficial standings and the number of licenses won for the upcoming Olympic Games, do not fully reflect these achievements. For instance, the French team, despite having one of the highest Most Successful Wrestler Index scores (1.92), only placed eighth and did not earn any licenses. Conversely, the teams from Armenia (9th place) and Iran (4th place), with relatively average index scores, secured the most licenses – three and four, respectively. This indicates that team performance results should be viewed holistically and in accordance with the specific goals of the national teams [Roklicer *et al.* 2020], while the use of the index is more suited for individual performances when considering specific opponents [Dokmanac, Slacanac 2018].

## Conclusions

The study analyzed performances at the 2023 World Championship in Greco-Roman wrestling, highlighting significant tactical variances among top-10 ranked national teams. The statistical analysis confirmed significant differences among athletes from several teams in the number of points scored in standing and parterre

positions. Simultaneously, only four types of actions (gut wrench, step out, lifts, and take down) constitute more than 70% of all actions performed by wrestlers, regardless of the team. Additionally, non-standard situations influenced the spectacle of the match, contributing to a high proportion of points, with this indicator exceeding 25% of all actions for some countries. Performance metrics identified certain teams with the highest Most Successful Wrestler Index: Cuba and France, at 2.69 and 1.92, respectively. It is noteworthy that the success index metrics, while associated with team rankings and Olympic qualification, do not fully capture the extent of their achievements, highlighting the need for a more holistic approach to evaluating team performances.

## Acknowledgement

The authors sincerely thank the subjects, who participated in this study and contributed to the realization of this study. This research received no funding.

## References

1. Aquino T.N., Macedo F.V., Gomes A.C., Torres F.C., Bori J.P. (2023), *Analysis of the effectiveness coefficient in Greco-Roman fighting athletes at different levels of competition*, "Revista Brasileira de Medicina do Esporte", vol. 30 - e2022\_0222, pp. 1-4; doi: 10.1590/1517-8692202430022022\_0222i
2. Baginska J., Piepiora P., Piepiora Z., Witkowski K. (2022), *The geography of Olympic combat sports—part two: boxing, fencing, modern pentathlon, wrestling*, "Archives of Budo", vol. 18, pp. 327-340.
3. Curby D., Dokmanac M., Kerimov F., Tropin Y., Latyshev M., Bezkorovainyi D., Korobeynikov G. (2023), *Performance of wrestlers at the Olympic Games: gender aspect*, "Pedagogy of Physical Culture and Sports", vol. 27, no. 6, pp. 487-493; doi: 10.15561/26649837.2023.0607.
4. Curby D.G., Jomand G. (2015), *The evolution of women's wrestling: History, issues and future*, "International Journal of Wrestling Science", vol. 5, no. 1, pp. 2-12; doi: 10.1080/21615667.2015.1040536.
5. Dokmanac M., Slacanac K. (2018), *Analysis of the Most Important Parameters in Wrestling Matches from the Senior World Championship 2017, the Senior European Championship 2018 and the World Championship 2018*, "International Journal of Wrestling Science", vol. 8, no. 2, pp. 18-29.
6. Forrest D., McHale I.G., Sanz I., Tena J.D. (2017), *An analysis of country medal shares in individual sports at the Olympics*, "European Sport Management Quarterly", vol. 17, no. 2, pp. 117-131.
7. Franchini E., Takito M.Y. (2014), *Olympic preparation in Brazilian judo athletes: description and perceived relevance of training practices*, "The Journal of Strength & Condition-

- ing Research", vol. 28, no. 6, pp. 1606-1612; doi: 10.1519/JSC.0000000000000300.
8. Janowski M., Zielinski J., Kusy K. (2021), *Exercise response to real combat in elite taekwondo athletes before and after competition rule changes*, "The Journal of Strength & Conditioning Research", vol. 35, no. 8, pp. 2222-2229; doi: 10.1519/JSC.0000000000003110.
  9. Jansen J., Engbersen G. (2017), *Have the Olympic Games become more migratory? A comparative historical perspective*, "Comparative migration studies", no. 5, pp. 1-15.
  10. Koenigstorfer J., Preuss H. (2018), *Perceived Values in relation to the Olympic Games: development and use of the Olympic Value Scale*, "European Sport Management Quarterly", vol. 18, no. 5, pp. 607-632; doi: 10.1080/16184742.2018.1446995.
  11. Korobeinikova L., Korobeynikov G., Cynarski W.J., Borysova O., Kovalchuk V., Matveev S., Vorontsov A., Novak V. (2020), *Tactical styles of fighting and functional asymmetry of the brain among elite wrestlers*, "Ido Movement for Culture Journal of Martial Arts Anthropology", vol. 20, no. 4, pp. 24-30; doi: 10.14589/ido.20.4.4.
  12. Kovacs E., Gulyas E., Sterbenz T. (2017), *Determinants of a nation's sport performance at different mega sport events*, "Society and Economy", vol. 39, no. 4, pp. 573-596.
  13. Kruszewski A., Kuzmicki S., Kruszewski M., Jagiello W. (2012), *Trends in technical and tactical modifications among competitors of various nationalities based on research conducted during the 2009 World Youth Championship in Greco-Roman Style Wrestling in Turkey*, "Polish Journal of Sport and Tourism", vol. 19, no. 2, pp. 119-122.
  14. Kruszewski A. (2023), *Wrestling fight between tradition, sport and spectacle*, "Archives of Budo", vol. 19, pp. 21-27.
  15. Latyshev M., Latyshev S., Korobeynikov G., Kvasnytsya O., Shandrygos V., Dutchak Y. (2020), *The analysis of the results of the Olympic free-style wrestling champions*, "Journal of Human Sport and Exercise", vol. 15, no. 2, pp. 400-410; doi: 10.14198/jhse.2020.152.14.
  16. Latyshev M., Rybak L., Holovach I., Korolov B., Liashenko O., Kvasnytsya O. (2019), *Analysis of performances of European Championship participants among women's wrestling cadets*, "Slobozhanskyi herald of science and sport", vol. 7, no. 5(73), pp. 53-56; doi: 10.15391/sns.v.2019-5.007.
  17. Malloy C.Q. (2020), *Local varieties of Olympic wrestling - Mongolia*, "International Journal of Wrestling Science", vol. 10, no. 1, pp. 15-19.
  18. Pashkov I., Tropin Y., Romanenko V., Goloha V., Kovalenko J. (2021), *Analysis of competitive of highly qualified wrestlers*, "Slobozhanskyi herald of science and sport", vol. 9, no. 5, pp. 30-39; doi: 10.15391/sns.v.2021-5.003.
  19. Matkarimov R., Korobeynikov G., Tropin Y., Biletska V., Curby D., Dokmanac M., Kerimov F. (2024), *Indicators of Spectacle in Wrestling at the 2021 Olympic Games*, "Slobozhanskyi Herald of Science and Sport", vol. 28, no. 1, pp. 38-43; doi: 10.15391/sns.v.2024-1.005.
  20. Rokliger R., Dokmanac M., Curby D.G., Lakicevic N., Trivic T., Slacanac K., Baic M., Drid P. (2020), *Performance data analysis of Greco-roman wrestling of the 2019 European championships*, "International Journal of Wrestling Science", vol. 10, no. 2, pp. 1-10.
  21. Romanenko V., Podrigalo L., Cynarski W.J., Rovnaya O., Korobeynikova L., Goloha V., Robak I. (2020), *A comparative analysis of the short-term memory of martial arts athletes of different level of sportsmanship*, "Ido Movement for Culture Journal of Martial Arts Anthropology", vol. 20, no. 3, pp. 18-24; doi: 10.14589/ido.20.3.3.
  22. Salcinovic B., Drew M., Dijkstra P., Waddington G., Serpell B.G. (2022), *Factors influencing team performance: what can support teams in high-performance sport learn from other industries? A systematic scoping review*, "Sports Medicine-Open", vol. 8, no. 1, p. 25.
  23. Smith-Ditizio A., Smith A.D. (2023), *Olympic Games, media coverage and brand image/performance from fan and gender perspectives*, "Benchmarking: An International Journal", vol. 30, no. 2, pp. 503-531; doi: 10.1108/BIJ-02-2022-0117.
  24. Soyguden A., Imamoglu O. (2017), *Technical Analysis of 12th World Universities Wrestling Championship Greco-Roman Style Competition*, "Baltic Journal of Sport and Health Sciences", vol. 4, no. 107, pp. 28-37; doi: 10.33607/bjshs.v4i107.37.
  25. Strelchuk S., Lukina O., Savchenko V., Cynarski W.J., Baic M., Barbas I., Korobeynikov G. (2022), *Peculiarities of the competitive activity of taekwondo players aged 12-13 years before and after the changes in the rules*, "Health, Sport, Rehabilitation", vol. 8, no. 3, pp. 75-88; doi: 10.34142/HSR.2022.08.03.06.
  26. Telles T.C.B., Machado R.P.T. (2022), *Wrestling, boxing and pankration: introducing the heavy events' in Ancient Olympic Games*, "Olimpianos-Journal of Olympic Studies", vol. 6, pp. 251-267; doi: 10.30937/2526-6314.v6.id165.
  27. Tropin Y., Romanenko V., Cynarski W.J., Boychenko N., Kovalenko J. (2022), *Model characteristics of competitive activity of MMA mixed martial arts athletes of different weight categories*, "Slobozhanskyi Herald of Science and Sport", vol. 26, no. 2, pp. 41-46; doi: 10.15391/sns.v.2022-2.002.
  28. Tropin Y., Podrigalo L., Boychenko N., Podrihalo O., Volodchenko O., Volskyi D., Roztorhui M. (2023), *Analyzing predictive approaches in martial arts research*, "Pedagogy of Physical Culture and Sports", vol. 27, no. 4, pp. 321-330; doi: 10.15561/26649837.2023.0408.
  29. Tunnemann H., Curby D. (2016), *Scoring Analysis of the Wrestling from the 2016 Rio Olympic Games*, "International Journal of Wrestling Science", vol. 6, pp. 90-116; doi: 10.1080/21615667.2017.1315197.
  30. Vasilescu F., Leonte N., Popescu O. (2023), *Optimising the Competitive Performance of Junior Greco-Roman Wrestlers by Consolidating and Improving Their Takedown Techniques*, "Revista Romaneasca Pentru Educatie Multidimensionala", vol. 15, no. 4, pp. 324-338; doi: 10.18662/rrem/15.4/796.
  31. Wrestling to Debut Ranking Series in 2023, United World Wrestling. Available from: <https://unitedworldwrestling.org/article/wrestling-debut-ranking-series-2023> [Access: Mar. 2024].

## Zapasy klasyczne na scenie światowej: trendy wydajnościowe i porównania krajów

**Słowa kluczowe:** zapasy klasyczne, igrzyska olimpijskie, analiza wyników, wskaźnik sukcesu, mistrzostwa świata

### Streszczenie:

Tło. Igrzyska Olimpijskie to największe wydarzenie sportowe, łączące sportowców z całego świata w duchu rywalizacji, osiągnięć i jedności. Mistrzostwa Świata 2023 służą jako główne kwalifikacje do Igrzysk Olimpijskich w 2024 roku, dostarczając kluczowych danych na temat technicznych i strategicznych wyników elitarnych zapaśników.

Problem. Celem badania była identyfikacja kluczowych aspektów najlepiej sklasyfikowanych drużyn na Mistrzostwach Świata w Zapasach w Stylu Klasycznym 2023 i przeprowadzenie analizy porównawczej.

Metody. W badaniu tym przeanalizowano 271 walk z udziałem 86 zapaśników z 10 krajów przy użyciu platformy Performance Data Analysis firmy United World Wrestling. Obliczono

kluczowe wskaźniki wydajności, takie jak czas trwania meczu, liczba akcji w pozycji stojącej i parterowej oraz wskaźniki sukcesu.

Wyniki. Wskaźniki wyników ujawniły preferencje dla pozycji stojącej i parterowej, przy czym drużyny takie jak Kuba i Francja uzyskały najwyższe wyniki w Indeksie Najskuteczniejszych Zapaśników, odpowiednio 2,69 i 1,92. Warto zauważyć, że czynności takie jak przewrót przez pas, wypchnięcie poza matę, podnoszenia i sprowadzenie do parteru stanowiły ponad 70% wszystkich akcji. Analiza statystyczna potwierdziła istotne różnice w akcjach parterowych wśród zapaśników z Azerbejdżanu, Turcji, Gruzji i Armenii.

Wnioski. Badanie podkreśla złożoność preferencji taktycznych, które wpływają na wyniki zespołu na mistrzostwach świata. Odkrycia podkreślają kluczową rolę zaawansowanych analiz w zwiększaniu zrozumienia i planowania strategicznego w zapasach. Wskaźniki sukcesu, choć powiązane z rankingami drużyn i kwalifikacjami olimpijskimi, nie oddają w pełni zakresu ich osiągnięć.