

**COMPETITIVE EFFICIENCY ACROSS AGE CATEGORIES IN WOMEN
WRESTLING (WW)**

SENIORS, U23, U20, and U17

**ANALYSIS OF PERFORMANCE INDICATORS AT THE 2025 WORLD
CHAMPIONSHIPS**

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CONTENTS:

ABSTRACT	4
INTRODUCTION	4
METHODS	5
Data Source	5
Number of wrestlers (World Championships 2025 – Senior, U23, U20, U17) / GR-FS-WW	5
Number of matches (World Championships 2025 – Senior, U23, U20, U17) / GR-FS-WW	5
Number of tags (World Championships 2025 – Senior, U23, U20, U17) / GR-FS-WW	6
Performance Indicators	6
Data Processing	6
Analytical Approach.....	7
RESULTS AND DISCUSSION	7
Developmental Pathway of Competitive Performance in Freestyle Wrestling (U17, U20, U23, and Seniors)	7
1. Overall Share of Points by Technical Segments (%)	8
Contribution of the Five Most Frequent Scoring Segments	9
Comparison of the Five Most Frequent Scoring Actions (Technical and Non-Technical Points)	11
2. Overview of Scoring Techniques by Weight Categories and Age Groups	11
3. WQ/min – by Age Category	12
WQ/min & PERIOD 1976–2025 (SENIORS ONLY)	14
4. Points in Percentage (%): Standing Position / Parterre Position	14
5. Points in Percentage (%): Technical Points / Other Points	15
Chi-Square Analysis: Technical vs. Non-Technical Points	16
6. Distribution of Matches by Type of Victory	16
7. National Team Performance – Highest Points / Top Three Teams	17
Comparative Analysis of Wrestling Techniques by Age Category	19
USA	20
IND	20
JPN	21
8. Overview of the Percentage Distribution of Points: “All Matches”, “Medal Matches (Final I–II, III–V)”, “All Matches of Winners – Gold Medalists”	21
9. Execution of Techniques According to Time Parameters (All Matches)	23
General Conclusion for Time Parameters	24
First Minute of the Match	24
Second minute of the match	25

Third minute of the match	25
Fourth minute of the match	25
Fifth minute of the match	25
Sixth minute of the match	26
10. Most Successful Wrestler (MSW)	26
11. Champions / Points Scored and Conceded	27
Percentage (%) of points scored by champions:	27
Percentage (%) of points conceded by champions:	27
Frequency of Techniques Executed by Champions	28
KEY CONCLUSIONS.....	29
RECOMMENDATIONS FOR UWW AND WRESTLING COACHES	30
Strategic implications for UWW	30
Long-term athlete development	30
Coaching focus by age category	30
Training focus	30
Training methodology	31
Development of key technical segments	31
Training for scoring the first point.....	31
Development of standing wrestling and mat control	31
Development of parterre performance.....	31
Age-specific conditioning	32
Tactical education.....	32
Long-term development organization.....	32
Organization of the training process	32
Role of the coach.....	32

ABSTRACT

This report presents a comprehensive analysis of competitive performance across all age categories (U17, U20, U23, and Senior) in freestyle wrestling, based on data collected from the 2025 World Championships. The aim of the study was to identify patterns of technical-tactical efficiency, scoring structure, positional contribution, and match intensity across age groups, with the objective of supporting long-term athlete development and coaching strategies based on empirical evidence.

The analysis reveals a clear developmental progression from the high-intensity and open style of wrestling observed at the U17 level toward more controlled and efficiency-oriented performances in the older age categories. Match intensity, expressed as points scored per minute of bout time (WQ), was significantly higher in the U17 category compared to all other age groups, followed by a pronounced decline when transitioning to the U20 category. From U20 to the senior level, WQ values stabilize, suggesting that further performance development is primarily based on tactical control and execution efficiency rather than an increase in technical volume or diversity.

The first scoring action showed a strong association with match outcome across all age categories, confirming the importance of early initiative and positional control at the elite competitive level. The findings identify the period up to the age of 20 as a critical transition phase in athlete development and highlight the need to define age-specific performance standards and training priorities.

This report provides practical insights for the **United World Wrestling (UWW)**, national federations, and coaches, contributing to better alignment between competitive demands and long-term athlete development models, as well as to the optimization of training focus across all age categories.

INTRODUCTION

Modern elite wrestling is characterized by continuous changes in competition rules, tactical trends, and performance demands across all age categories. As a result, understanding how technical-tactical efficiency and match dynamics develop throughout the athlete development process has become one of the key priorities for international federations, national teams, and coaches.

Although previous research has mainly focused on senior wrestling, significantly less attention has been devoted to developmental transitions from cadet to senior categories, particularly through the use of objective, competition-based performance indicators. This lack of longitudinal analysis and research, competition-based evidence limits the ability of coaches and federations to design age-appropriate training models and clear performance criteria. World Championships provide a unique and standardized framework for such analyses, as they represent the highest level of competition in each age category (U17, U20, U23, and Senior) and reflect current global trends in wrestling performance.

A systematic analysis of technical-tactical actions, scoring structure, positional dominance (standing wrestling versus parterre), and match intensity provides a comprehensive understanding of how wrestling performance characteristics evolve with age and increasing competitive maturity.

Women's wrestling (WW) exhibits specific structural and tactical characteristics compared to the Greco-Roman (GR) style, while showing a high degree of similarity to freestyle wrestling (FS). Previous analyses have indicated a relatively stable level of efficiency and attractiveness in women's wrestling compared to the Greco-Roman style. In this context, the primary aim of this report is to analyze and compare competitive performance in women's wrestling (WW) across all age categories, using detailed technical-tactical indicators and match intensity metrics derived from data collected at World Championships.

Special emphasis is placed on:

- differences in scoring structure,
- the contribution of different wrestling positions to the total number of points scored (standing vs. parterre),
- the distribution of technical and other points,
- wrestler efficiency expressed as points per minute of combat (WQ/min),
- key actions and technical-tactical patterns that distinguish age categories.

By identifying stable patterns and critical transition points within the athlete development pathway, this report aims to provide practical, evidence-based insights for coaches, performance analysts, and decision-makers within United World Wrestling (UWW). The findings are intended to support the improvement of long-term athlete development strategies, optimization of age-specific training priorities, and the continuous enhancement of elite competitive performance in women’s wrestling (WW).

METHODS

Data Source

The analysis is based on official match data from World Championships organized by United World Wrestling (UWW), covering four age categories: U17, U20, U23, and Seniors. All data were obtained from the official UWW public data platform, Performance Data Analysis (PDA) (<http://uww.io/wpar>).

Only women’s wrestling (WW) matches were included in this report. All performance indicators were derived from official match results and competition records.

Number of wrestlers (World Championships 2025 – Senior, U23, U20, U17) / GR-FS-WW

Table 1. Number of wrestlers at the 2025 World Championships by age categories and styles.

Sn	COMPETITIONS	GR	FS	WW	TOTAL
1.	U17 SVETSKO PRVENSTVO	246	233	183	662
2.	U 20 SVETSKO PRVENSTVO	231	231	186	648
3.	U23 SVETSKO PRVENSTVO	255	241	189	685
4.	SENIOR SVETSKO PRVENSTVO	278	293	205	776
	TOTAL =	1.010	998	763	2.771

Number of matches (World Championships 2025 – Senior, U23, U20, U17) / GR-FS-WW

Table 2. Number of matches at the 2025 World Championships by age categories and styles.

Sn	COMPETITIONS	GR	FS	WW	TOTAL
1.	U17 SVETSKO PRVENSTVO	288	275	218	781
2.	U 20 SVETSKO PRVENSTVO	272	272	220	764
3.	U23 SVETSKO PRVENSTVO	299	282	224	805
4.	SENIOR SVETSKO PRVENSTVO	320	339	241	900
	TOTAL =	859	829	662	2.350

Table 3. Number of tags at the 2025 World Championships by age categories and styles.

Sn	COMPETITIONS	GR	FS	WW	TOTAL
1.	U17 SVETSKO PRVENSTVO	1.287	1.451	991	3729
2.	U 20 SVETSKO PRVENSTVO	1.345	1.644	1.113	4102
3.	U23 SVETSKO PRVENSTVO	1.373	1.699	1.127	4199
4.	SENIOR SVETSKO PRVENSTVO	1.444	1.876	1.149	4469
	TOTAL =	5.449	6.670	4.380	16.499

The previous three tables (Tables 1–3) present the basic data from four World Championships held in 2025: Senior, U23, U20, and U17, across all three Olympic wrestling styles.

All matches were analyzed, covering a total of **2,771 wrestlers** (Table 1) across the four age categories and all three wrestling styles.

In order to collect all the data required for this analysis, a **video review of 2,350 matches** (Table 2) was conducted across the four age categories and all three wrestling styles.

In total, **16,499 actions** were recorded in all matches across these four World Championships (Table 3), including all age categories and all three wrestling styles.

Based on this extensive dataset, a large amount of significant information was obtained regarding the characteristics of wrestling matches at the World Championships. Numerous comparative and expert analyses were conducted using different performance parameters across all four age categories.

Based on the results obtained, **specific conclusions were drawn and recommendations formulated**, which are presented at the end of this report and are of great importance for each of the four age categories.

Performance Indicators

Each match was analyzed using a standardized set of performance indicators, which included:

- technical-tactical variables (executed techniques in standing and parterre positions),
- scoring actions classified as technical and non-technical points,
- the contribution of wrestling position to the total number of points scored (standing position vs. parterre),
- match duration and the total number of points scored per minute of the bout,
- match intensity and wrestler efficiency expressed as points scored per minute of wrestling (WQ/min).

In addition, specific scoring situations (e.g., the first scoring action) and their relationship with the match outcome were also analyzed.

Data Processing

Performance indicators were calculated at the level of individual wrestlers and matches and then grouped according to age categories. To ensure comparability between age groups, selected indicators were expressed in relative or standardized forms (e.g., points per match, points per minute).

To assess differences between age categories, nonparametric statistical procedures (Kruskal–Wallis test) were applied where methodologically appropriate. Data processing and analysis were conducted using the Python programming language, employing standard analytical libraries such as Pandas, NumPy, and Matplotlib.

Analytical Approach

Comparisons between age categories were performed with the aim of identifying patterns and developmental changes in competitive performances. Nonparametric statistical methods were used in cases where the data distribution did not meet the assumptions of normality. Results were presented through a combination of descriptive statistics, graphical representations, and selected inferential analyses to support interpretation of the findings.

The focus of the analysis was not on individual athletes or national teams, but rather on identifying global developmental trends that characterize each age category at the World Championship level organized by United World Wrestling.

RESULTS AND DISCUSSION

Developmental Pathway of Competitive Performance in Women Wrestling (U17, U20, U23, and Seniors)

The most important developmental transition in women's wrestling is not reflected in abrupt changes in match structure, as observed in men's freestyle, but rather in a gradual increase in efficiency and intensity. Although certain fluctuations can be observed in the U23 category (particularly an increase in the share of non-technical points and a decrease in technical ones), this phase does not represent a pronounced structural transformation, but rather a short-term transitional adjustment before stabilization at the senior level.

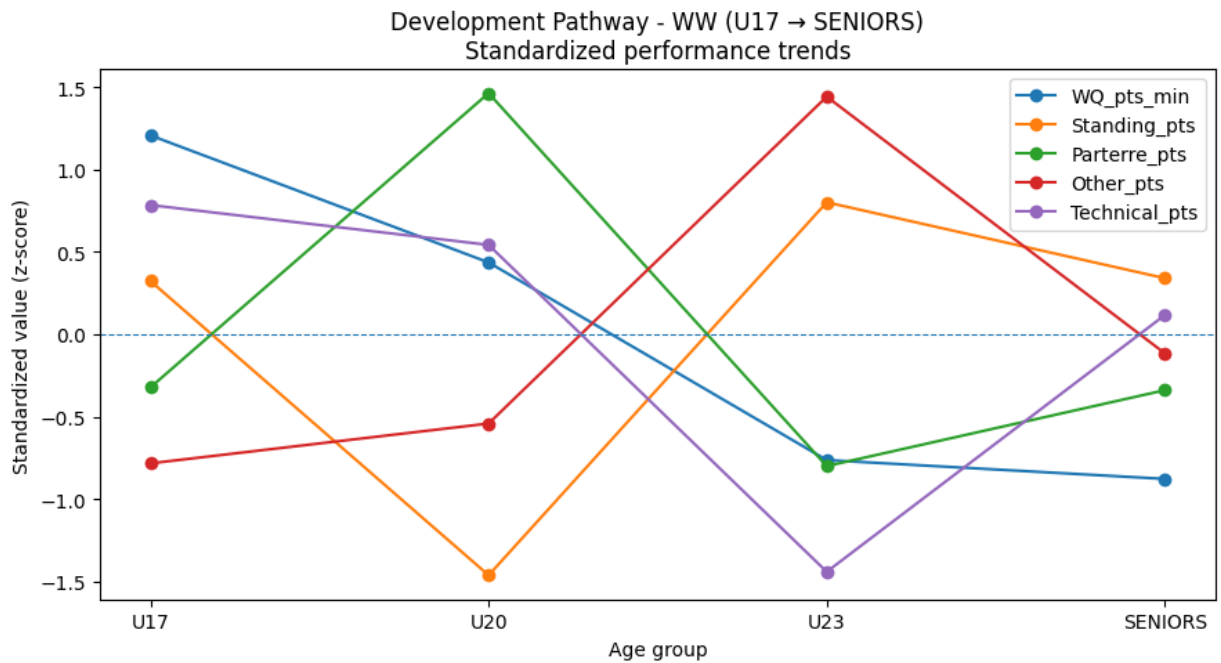
The developmental progression from the U17 category to the senior level is characterized by a gradual increase in match intensity, expressed through a higher number of points scored per minute of combat (WQ/min). These findings indicate that with increasing age, wrestlers demonstrate greater offensive efficiency and a more continuous match rhythm. Unlike men's freestyle, where the number of points tends to decrease with age, in women's wrestling older age categories score more points per unit of time, suggesting higher technical execution and a lower tendency to close out matches.

The variables `Standing_pts` and `Parterre_pts` show a relatively stable relationship across all age categories, without significant structural shifts. This suggests that development in women's wrestling does not occur through changes in the balance between standing and parterre positions, but rather through improvements in the quality of technical execution within an already established match structure.

For the variable `Technical_pts`, a consistently high proportion of technical points is observed across all age groups, while the variable `Other_pts` does not show a systematic increase with age. This indicates that matches remain predominantly technically oriented, without a substantial rise in tactical elements such as passivity and penalties, in contrast to freestyle (FS) and Greco-Roman (GR) wrestling.

Overall, the developmental model in women's wrestling (WW) is characterized by a stable match structure from the earliest age categories, accompanied by a gradual increase in intensity and efficiency. The U17 category is marked by a solid pace and high technical representation; U20 maintains a similar pattern with minor

fluctuations; U23 represents a transitional phase with certain tactical variations; while the senior level is characterized by the highest match intensity, structural stability, and pronounced technical dominance.



Graph 1. Overview of competitive performance across four age categories (Seniors, U23, U20, and U17) – Women’s Wrestling (WW)

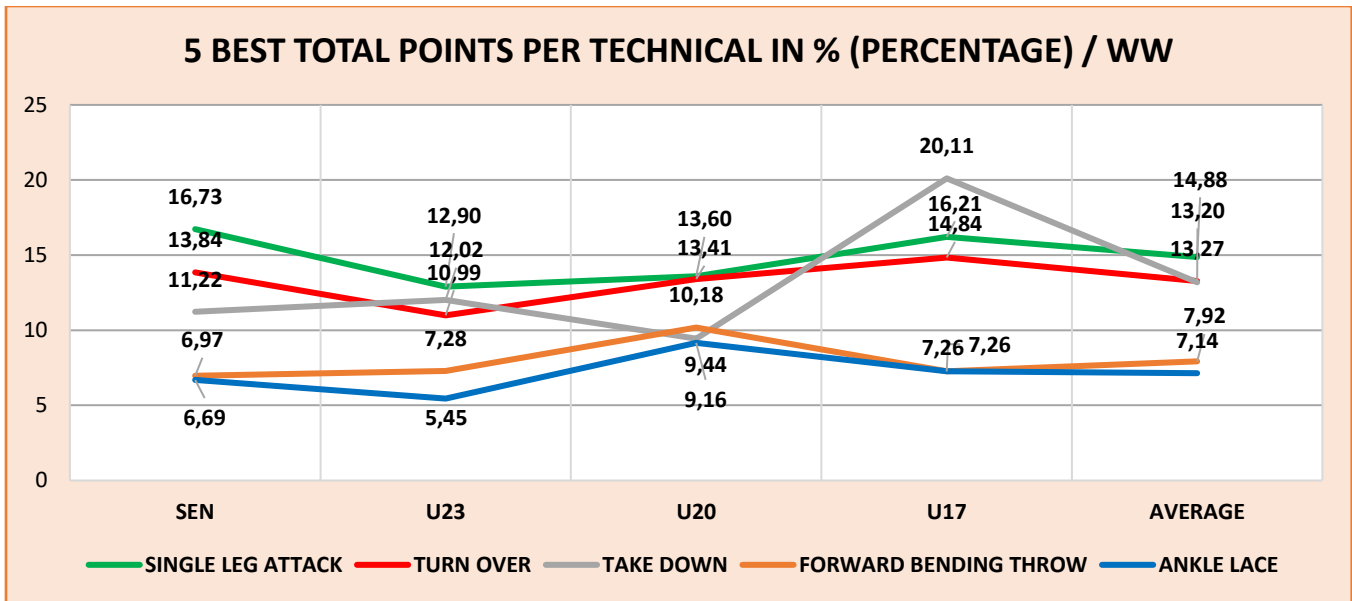
1. Overall Share of Points by Technical Segments (%)

Out of a total of 23 identified scoring segments in the match analysis, Figure 2 presents five segments (variables) that accounted for more than 7% of the total points scored on average across all four age categories.

All five segments refer to points scored through wrestling techniques (technical points), in contrast to Greco-Roman (GR) and freestyle (FS) wrestling. Notably, in the U17 category, three techniques stand out with values of 14% or higher compared to all other age groups: takedowns, single-leg attacks, and turnovers.

At the senior level, the single-leg attack is particularly prominent, accounting for 16.73% of total points—exceeding even the corresponding value in freestyle wrestling (15.56%). However, a significantly lower percentage of single-leg attacks was observed in women’s wrestling compared to freestyle in the U23 (FS = 15.71%) and U20 (FS = 14.73%) categories.

It is also noteworthy that the forward bending throw ranks as the fourth most represented technique, whereas in freestyle wrestling the corresponding positions are occupied by turnover (9.76%) and step-out (9.23%).



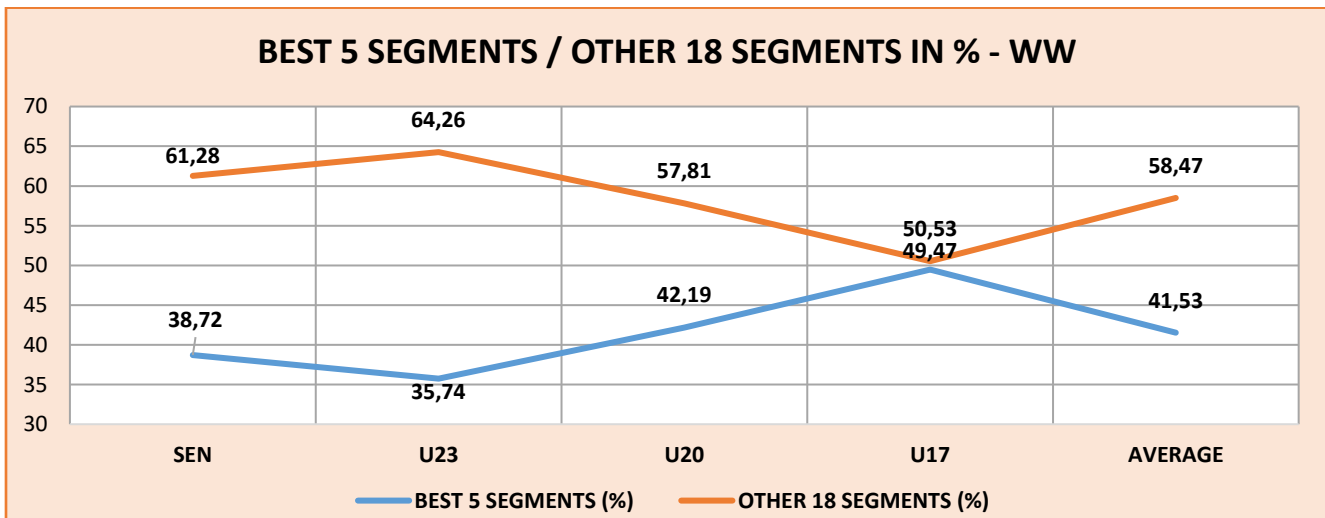
Graph 2. Five most frequent scoring actions: technical and non-technical points by age category

Contribution of the Five Most Frequent Scoring Segments

The analysis of the contribution of the top five segments across the entire sample shows that their combined share of total scoring ranges from 35.74% to 49.47%, with an average value of 41.53% (Figure 3).

A noticeable deviation is observed in the youngest age group (U17), where the top five segments account for a higher proportion of total points (49.47%), with as many as three segments individually exceeding 14%.

These findings indicate that, in younger age categories, scoring is achieved through a narrower range of technical actions (throws), which is not a favorable indicator. It suggests early specialization at the U17 level, as the remaining 18 techniques contribute significantly fewer points. In contrast, in the U23 category, as much as 64.26% of points are scored using the other 18 techniques, reflecting a more diversified technical repertoire.



Graph 3. Overview of competitive performance across four age categories (Senior, U23, U20, and U17) in freestyle wrestling.

Table 4 provides an overview of all technical-tactical variables (a total of 23 segments) across age categories, expressed as percentages (%). Based on these data, it is possible to conduct a detailed comparison of scoring structures across different age groups. Particular emphasis is placed on the percentage distribution of points for the dominant wrestling techniques (the top five), across all segments and matches in women's wrestling (WW) for four age categories.

The most notable deviations are observed in the U17 category for the takedown technique, which, at 20.11%, is the most represented technique across all age groups and slightly higher compared to freestyle wrestling (FS = 15.11%). In the U20 category, in addition to takedowns, the head-to-head technique (7.40%) also stands out, while in the U23 and senior categories, the values for the hip turning throw in women's wrestling are nearly twice as high as in freestyle (U23 = 2.43%; seniors = 2.33%).

Significant differences between women's wrestling (WW) and freestyle (FS) are also evident in the gut wrench and turnover techniques. In WW, gut wrench values range from 5.26% to 7.70%, whereas in FS they range from 10.78% to 12.80%. Conversely, turnover values are higher in WW (10.99%–14.84%) compared to FS (8.52%–10.58%).

The greater prevalence of the gut wrench technique in freestyle wrestling can be partially explained by biomechanical and physiological differences, as this technique requires a high level of core strength, rotational force, and the ability to generate continuous pressure through successive actions. In this context, greater absolute strength and more developed shoulder girdle and trunk musculature in male wrestlers enable more efficient execution of this technique compared to women's wrestling.

Table 4. Overview of all technical-tactical variables by age category expressed in percentages (%).

Rb	WRESTLING TECHNIQUE	SEN	U23	U20	U17	AVERAGE%
1.	SINGLE LEG ATTACK	16.73	12.96	13.60	16.21	14.88
2.	TURN OVER	13.84	10.99	13.41	14.84	13.27
3.	TAKE DOWN	11.22	12.02	9.44	20.11	13.20
4.	FORWARD BEDING THROV	6.97	7.28	10.18	7.26	7.92
5.	ANKLE LACE	6.69	5.45	9.16	7.26	7.14
6.	GUT WRENCH	6.97	7.70	6.48	5.26	6.60
7.	HIP TURNING THROV	7.51	7.42	4.02	4.53	5.87
8.	DOUBLE LEG ATTACK	6.06	6.20	4.53	5.37	5.54
9.	ACTIVITY TIME	5.07	5.77	3.33	5.00	4.79
10.	STEP OUT	4.16	6.10	4.86	3.42	4.64
11.	PARTERRE COUNTER	3.84	5.02	4.76	3.37	4.25
12.	TAKE DOWN HEAD TO HEAD	2.80	3.19	7.40	0.00	3.35
13.	STANDING COUNTER	2.53	2.91	3.15	3.05	2.91
14.	SUPLEX THROW	2.99	2.77	2.59	1.42	2.44
15.	STANDING CHALLENGE	1.09	0.70	0.60	0.74	0.78
16.	SHOULDER TURNING THROW	0.27	1.22	0.65	0.63	0.69
17.	PARTERRE CHALLENGE	0.36	0.56	0.60	0.58	0.53
18.	PARTERRE CAUTION	0.05	0.38	0.74	0.32	0.37
19.	STANDING CAUTION	0.50	0.23	0.46	0.21	0.35
20.	FRONT HEAD LOCK	0.27	0.75	0.00	0.42	0.36
21.	LIFTS – SUPLEX	0.00	0.38	0.00	0.00	0.10
22.	NEGATIVE WRESTLING	0.09	0.00	0.05	0.00	0.01
23.	LIFTS – REVERSE GRIP	0.00	0.00	0.00	0.00	0.00

Legend: **Red color** – highest result by wrestling technique / **Green color** – lowest result by wrestling technique

Comparison of the Five Most Frequent Scoring Actions (Technical and Non-Technical Points)

I – Across the four age categories, the single-leg attack is the most frequently applied scoring technique, with an average share of 14.88%. It is not the most dominant technique only in the U17 category. The highest values are recorded in the Seniors (16.73%) and U17 (16.21%) categories.

II – Regarding the turnover technique, scoring is relatively consistent across all four age categories, ranging around 13–14%, with a slight exception in U23, where its representation is approximately 2% lower.

III – The takedown technique shows a wide variation across age categories, ranging from 9.44% in U20 to as high as 20.11% in U17.

IV – The forward bending throw shows its highest representation in the U20 category (10.18%), while its lowest frequency is observed at the senior level (6.97%).

V – The ankle lace technique is most prevalent in the U20 category (9.16%), while its lowest occurrence is recorded in the U23 category (5.45%).

2. Overview of Scoring Techniques by Weight Categories and Age Groups

An analysis of points scored across weight categories (Table 5) indicates that senior wrestlers in the 68 kg weight class demonstrate the widest technical repertoire, achieving the highest number of points using a diverse range of techniques, across as many as four different wrestling actions. In the 74 kg category, the highest number of points was scored using the single-leg attack (48 points).

In the U23 age category, two weight classes stand out—50 kg and 53 kg—each featuring three dominant wrestling techniques. In the 50 kg category, the highest number of points was scored using the turnover technique (60 points), while in the 53 kg category, the takedown was the most effective technique (40 points).

In the U20 category, two weight classes—65 kg and 68 kg—also stand out, each with three dominant techniques. In the 65 kg category, the highest number of points was scored using the takedown (46 points), while in the 68 kg category, the turnover was the most productive technique (54 points).

In the U17 category, the most prominent weight classes are 53 kg and 57 kg, each with three dominant techniques. In the 53 kg category, the highest number of points was scored using the takedown (74 points), while in the 57 kg category, the forward bending throw was the most effective technique (34 points).

Table 5. Highest number of points scored according to technique, weight category, and age group

Rb	WRESTLING TECHNIQUE	SEN		U23		U20		U17		TOTAL POINTS	AVERAGE POINTS
		Cat/kg	pts	Cat/kg	pts	Cat/kg	pts	Cat/kg	pts		
1	TURN OVER	53	54	50	60	68	54	53	46	214	53.50
2	TAKE DOWN	68	48	53	40	65	46	53	74	208	52.00
3	SINGLE LEG ATTACK	50	54	50	44	65	52	49	48	198	49.50
4	FORWARD BEDING THROV	57	36	55	25	68	50	57	34	145	36.25

5	GUT WRENCH	62	30	65	56	68	28	46	28	142	35.50
6	ANKLE LACE	50	32	62	22	59	48	53	36	138	34.50
7	HIP TURNING THROV	65	30	50	44	62	22	69	20	116	29.00
8	DOUBLE LEG	68	22	53	26	59	24	57	20	92	23.00
		59									
9	STEP OUT	68	18	53	21	65	29	57	12	80	20.00
10	ACTIVITY TIME	68	19	59	18	50	13	65	18	68	17.00
11	TAKE DOWN HEAD TO HEAD	76	12	68	14	53	40	0	0	66	16.50
12	SUPLEX THROV	53	12	57	10	50	12	69	9	43	10.75
13	SHOULDER TURNING THROW	62	4	57	16	53	8	46	8	36	9.00
14	FRONT HEAD LOOCK	59	6	59	8	0	0	69	4	18	4.50
15	LIFT- SUPLEX	0	0	62	4	0	0	0	0	4	1.00
16	LIFTS – REVERSE GRIP	0	0	0	0	0	0	0	0	0	0.00

When points are analyzed based on the highest number of points scored by wrestling techniques and weight categories, regardless of age group, the following patterns can be identified:

I – The turnover technique, which contributes the highest overall percentage of points, is predominantly observed in lighter weight categories (50 and 53 kg – Seniors, U23, and U17) and in middle weight categories (65 and 68 kg – U20 and Seniors).

II – The takedown is dominant in lighter weight categories (53 kg – U23 and U17) as well as in middle weight categories (65 and 68 kg – U20 and Seniors).

III – The single-leg attack is most prevalent in lighter weight categories (49 and 50 kg – U17, Seniors, and U23) and in the middle weight category (65 kg – U20).

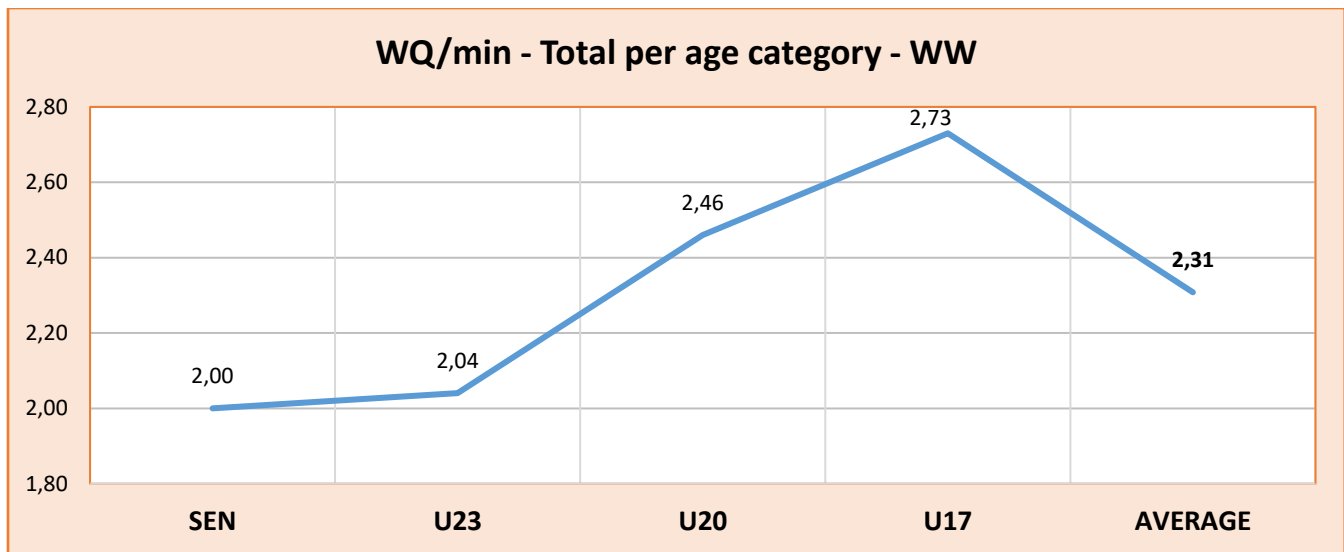
IV – The forward bending throw is most frequently applied in lighter weight categories (55 and 57 kg – across U23, Seniors, and U17), while in the middle weight categories it is most evident in U20 at 68 kg.

V – The gut wrench is most commonly used in the lighter weight category (46 kg – U17), and in middle weight categories across Seniors, U23, and U20, particularly in the 62, 65, and 68 kg divisions.

3. WQ/min – by Age Category

The WQ/min index represents one of the most important indicators in the analysis of wrestling match quality, as it reflects the number of points scored per minute of combat (points/min). Higher values of this index indicate more dynamic, attractive, and spectator-friendly wrestling.

The WQ/min values obtained in this analysis (Figure 4) are consistent with expectations, confirming a trend of decreasing points per minute as age category increases. An exceptionally high WQ/min value is observed in the U17 category, reaching 2.73.



Graph 4. WQ – Points per minute by age category, 2025 – GR.

The lowest number of points per minute of combat was recorded at the senior level (2.00 points/min). Although this value is lower compared to younger age groups, it remains relatively high and represents the highest level observed in the past four years (Figure 6).

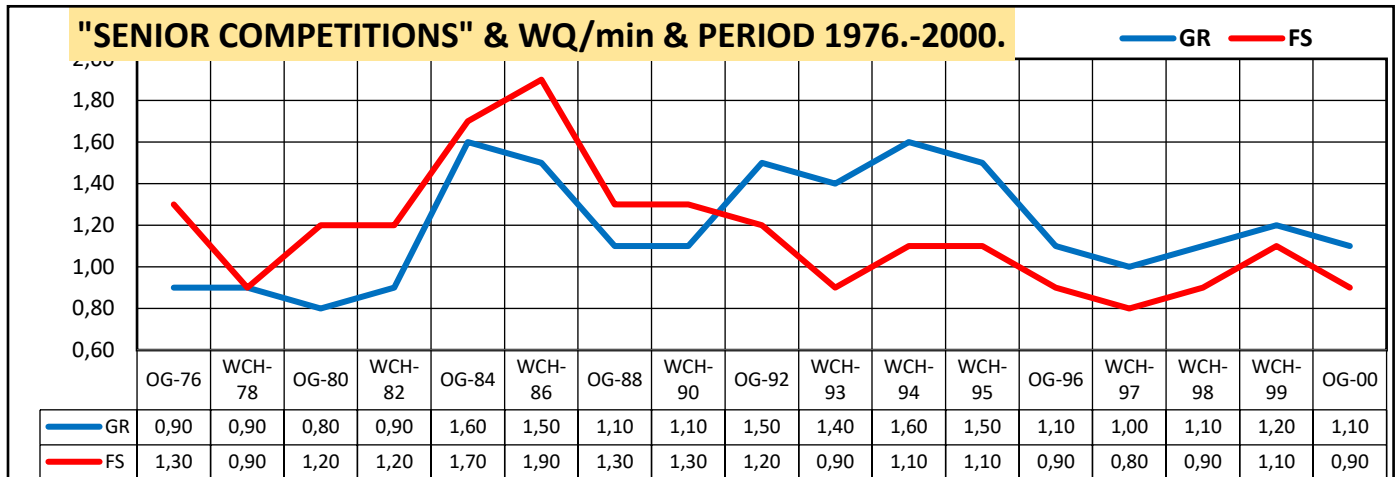
As age category increases, the level of tactical preparedness for matches also rises. This leads wrestlers to engage less frequently in high-risk situations and to attempt fewer techniques that carry a significant risk of counterattacks. In contrast, younger wrestlers demonstrate a greater tendency toward risk-taking and more frequently apply throws and high-risk techniques.

An additional factor contributing to the lower number of points per minute in older age categories is the significant difference in physical strength compared to U17 wrestlers. With increased strength, wrestlers are better able to neutralize their opponents and more effectively prevent conceding points.

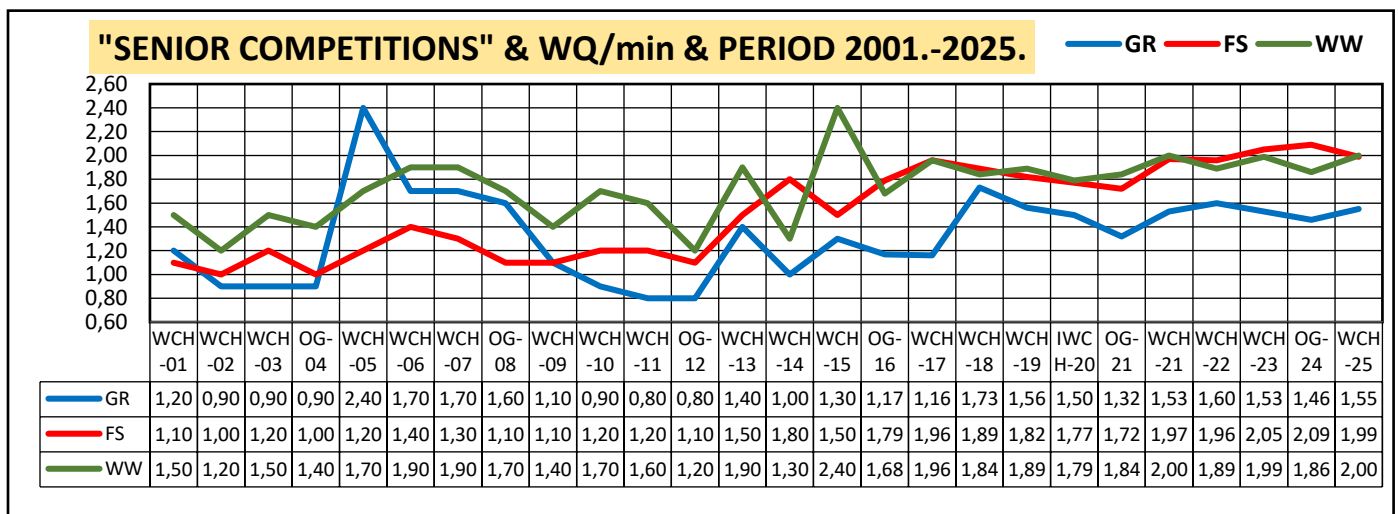
Compared to the other two Olympic wrestling styles (Greco-Roman and freestyle), women’s wrestling (WW) shows a WQ/min index at a level similar to freestyle, and significantly higher than in Greco-Roman across all four age categories.

Figures 5 and 6 present, for the first time since 2015—when Dr. Tünnemann concluded his analyses of major world competitions—comprehensive data on the WQ/min index for senior-level competitions (World Championships and Olympic Games). These graphs are particularly important as they enable the tracking of trends in elite international wrestling.

Since 2025, analyses of World Championships have been conducted across all age categories (Seniors, U23, U20, and U17). For the U23 category, WQ/min analysis has been continuously performed since 2021. From 2025 onward, analyses will be carried out across all four age groups, allowing for systematic monitoring of trends in younger age categories as well.



Graph 5. WQ – points per minute by age categories, 1976–2000 – GR/FS



Graph 6. WQ – points per minute by age categories, 2001–2025 – GR/FS/WW

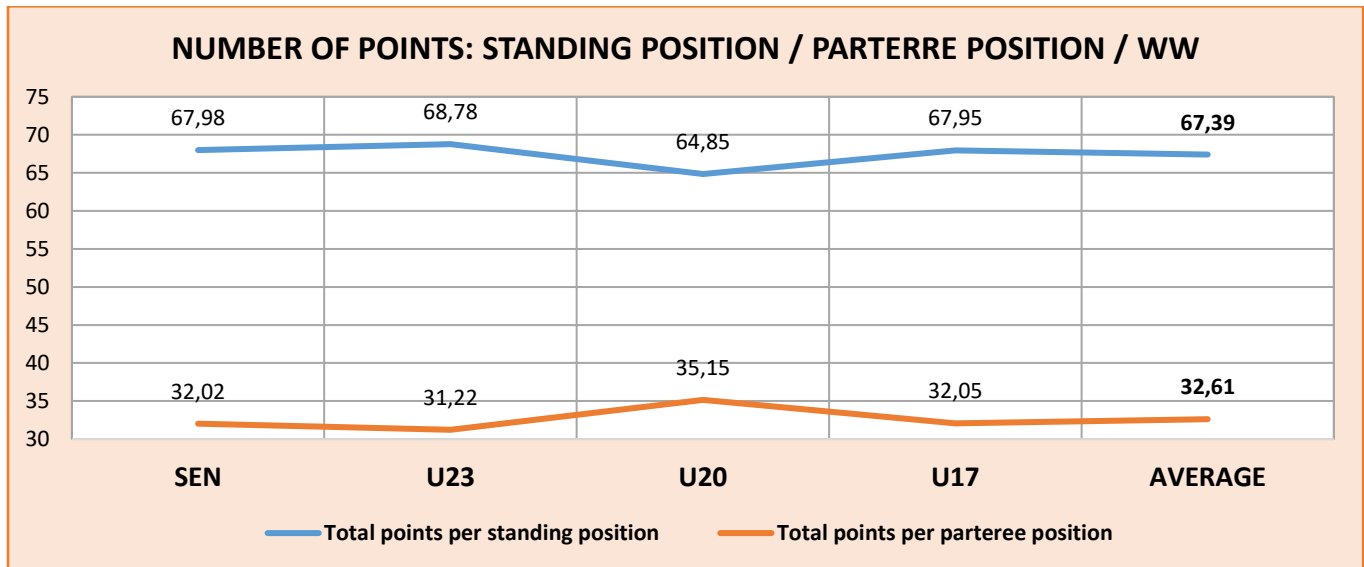
4. Points in Percentage (%): Standing Position / Parterre Position

The results show that, on average, 67.39% of points are scored from the standing position (Figure 7), with the largest contribution coming from points obtained through the single-leg attack (14.88% on average across all four age categories).

Wrestlers who scored the first point won 70.3% of the analyzed matches. Logistic regression indicated that scoring the first point is a statistically significant predictor of victory ($\beta = 1.73$; $p < 0.001$), with the odds of winning being approximately 5.6 times higher for the wrestler who scores first. The model explains about 12% of the variance in match outcomes (Pseudo $R^2 = 0.123$). Compared to freestyle, the effect of the first point in women’s wrestling is weaker, indicating greater match openness and a higher likelihood of comebacks.

Observed differences in the number of points scored from standing and parterre positions generally fall within the expected range, except in the U20 category, where a slightly higher proportion of points was recorded from the parterre position (35.15%) (Figure 7).

The chi-square test revealed a statistically significant association between age category and the distribution of points scored from standing and parterre positions in women’s wrestling ($\chi^2 = 8.843$; $df = 3$; $p < 0.032$). However, the value of Cramér’s $V = 0.0324$ indicates a very weak strength of association, suggesting that although statistically detectable differences exist between age groups, the pattern of scoring between standing and parterre positions remains relatively stable across developmental categories, with limited practical significance.

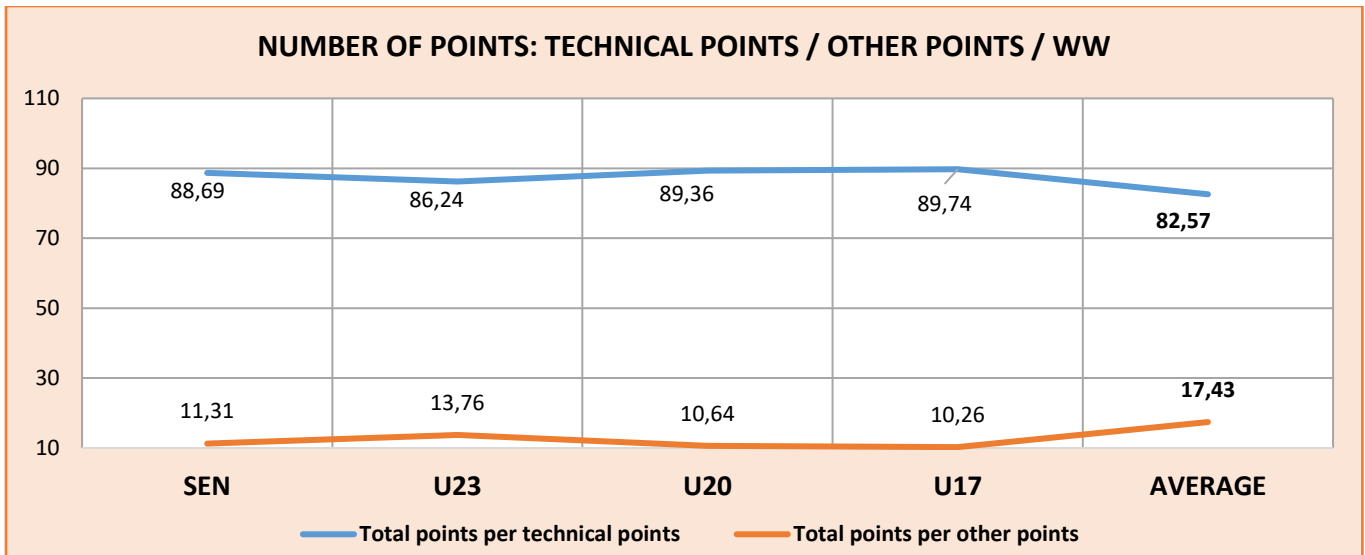


Graph 7. Distribution of points from standing and parterre positions (%) by age categories.

5. Points in Percentage (%): Technical Points / Other Points

The results related to technical and non-technical points fall within the expected range (Figure 8). Variations between these parameters are minimal, with differences of only about 5%.

In the senior category, the highest level of tactical maneuvering is observed, resulting in a slightly higher share of non-technical points, particularly those awarded for activity time and step-out situations (19.15%). In contrast, the U17 category recorded the lowest proportion of non-technical points, at only 14.14%.



Graph 8. Distribution of technical and non-technical points (%) by age categories.

Chi-Square Analysis: Technical vs. Non-Technical Points

The chi-square analysis revealed a statistically significant association between age category and the proportion of technical versus non-technical points ($\chi^2 = 15.139$; $df = 3$; $p < 0.002$). However, the value of Cramér's $V = 0.042$ indicates a very weak strength of association.

These findings suggest that, although statistically significant differences exist between age categories in the scoring structure, the practical impact of these differences is limited. With increasing age, certain changes in the relative share of technical and non-technical points can be observed. While technical actions remain the dominant source of scoring across most age groups, the proportion of non-technical points slightly increases in older categories, likely reflecting greater tactical control of matches and the growing importance of strategic elements at higher levels of competition.

6. Distribution of Matches by Type of Victory

Data from Table 6 show that the U23 age category has the highest proportion of matches lasting the full 6 minutes (54.9%), with 47.3% classified as VPO1 and 7.6% as VPO, representing wins on points with or without points scored by the losing wrestler.

The highest proportion of victories by fall (VFA 5–0) was recorded in the U20 (26.8%) and U17 (25.7%) categories. This indicates that, in these age groups, coaches should place greater emphasis on training defensive skills in the “bridge” position.

In the U23 category, the highest proportion of victories was achieved by technical superiority, both with and without points scored by the opponent (VSU 4–0 and VSU1 4–1), totaling 32.3%.

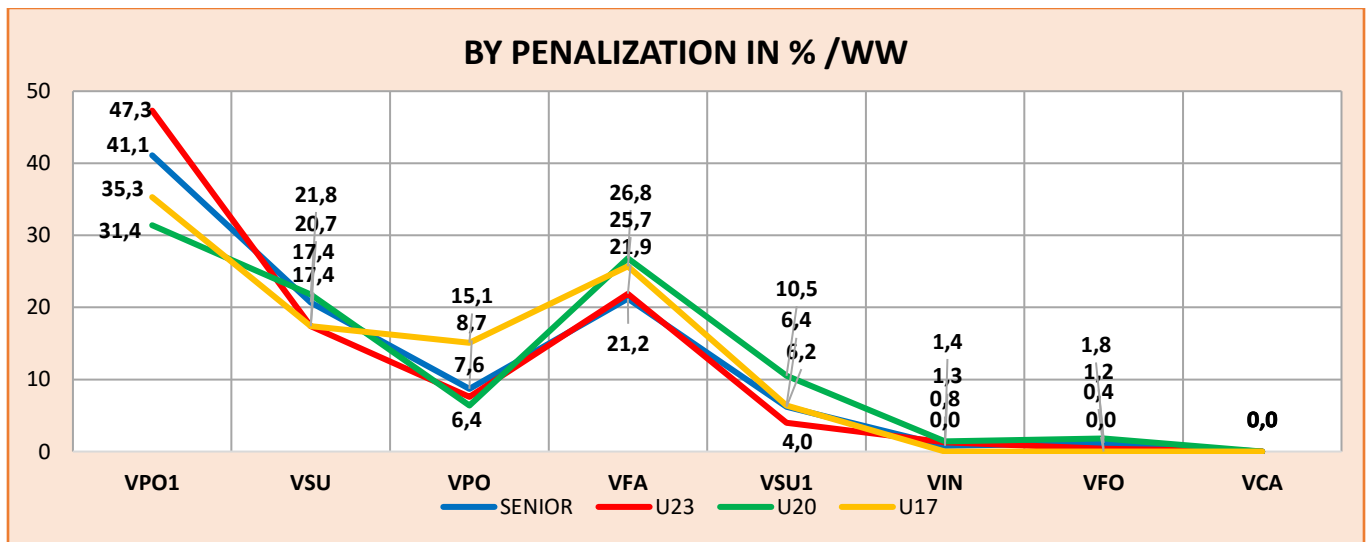
The percentage of victories due to injury is highest in the U20 category, accounting for 1.4% of all matches (VIN 5–0).

Table 6. Type of victory by age category (%).

AGE GROUPS	VPO1	VSU	VPO	VFA	VSU1	VIN	VFO	VCA
SENIORS	41,1	20,7	8,7	21,2	6,2	0,8	1,2	0,0
U23	47,3	17,4	7,6	21,9	4,0	1,3	0,4	0,0
U20	31,4	21,8	6,4	26,8	10,5	1,4	1,8	0,0
U17	35,3	17,4	15,1	25,7	6,4	0,0	0,0	0,0
AVERAGE	38,8	19,3	9,5	23,9	6,8	0,9	0,9	0,0

Legend:

- **VPO1** – Victory by points (**opponent scored points**)
- **VSU** – Victory by technical superiority (**opponent scored no points**)
- **VPO** – Victory by points (**opponent scored no points**)
- **VFA** – Victory by fall
- **VSU1** – Victory by technical superiority (**opponent scored points**)
- **VIN** – Victory due to injury (if a wrestler was injured before or during the match)
- **VFO** – Victory by forfeit (if a wrestler did not appear on the mat)
- **VCA** – Victory due to **3 cautions** against the opponent during the match



Graph 9 – Distribution of match outcomes by type of victory (penalization), expressed in %

7. National Team Performance – Highest Points / Top Three Teams

The analysis of the most successful teams based on the total number of points scored across four age categories (Table 7) shows that two national teams—USA and India—ranked among the top three teams in all four age categories.

The UWW team also ranked among the top three in two age categories. It is important to note that the UWW team included wrestlers from two countries (Russia and Belarus). The number of wrestlers in the UWW team by age category was as follows: Seniors – 16, U23 – 17, U20 – 17, and U17 – 18, while other countries were limited to a maximum of 10 wrestlers per age category, or 40 in total. Despite having a larger number of wrestlers compared to other national teams, the UWW team did not achieve particularly strong results across the four World Championships in terms of total technical points scored.

In addition to USA and India, other teams that ranked among the top three based on total points include Japan (2 times), DPR Korea (1 time), and China (1 time).

The most frequently used techniques (i.e., the top-scoring technique) across all nations and age categories were: single-leg attack (4 times),

- ankle lace (3 times),
- turnover (3 times),
- takedown (2 times).

Table 7. Top three national teams by age category and the three most frequently used techniques (by points scored).

AGE CAT.	NAT.	I best technique	points	II best technique	points	III best technique	points	TOTAL poents
SENIORI	JPN	SINGLE LEG ATTACK	78	TURN OVER	38	FORWARD BENDING THROW	28	293
	PRK	ANKLE LACE	38	TURN OVER	32	SINGLE LEG ATTACK	22	208
	CHN	SINGLE LEG ATTACK	50	TURN OVER	46	TAKE DOWN	20	195
U23	UWW	TURN OVER	32	TAKE DOWN	26	ANKLE LACE	24	246
	IND	TAKE DOWN	40	SINGLE LEG ATTACK	34	GUT WRENCH	28	227
	USA	SINGLE LEG ATTACK	38	TURN OVER	28	ANKLE LACE	26	184
U20	JPN	ANKLE LACE	48	SINGLE LEG ATTACK	36	TURN OVER	34	267
	USA	ANKLE LACE	58	SINGLE LEG ATTACK	38	TAKE DOWN HEAD TO HEAD	20	221
	IND	TURN OVER	32	FORWARD BENDING THROW	24	TAKE DOWN HEAD TO HEAD	16	207
				SINGLE LEG ATTACK				
TAKE DOWN								
U17	USA	TURN OVER	54	TAKE DOWN	42	SINGLE LEG ATTACK	38	237
	IND	SINGLE LEG ATTACK	58	TAKE DOWN	38	TURN OVER	30	236
	UWW	TAKE DOWN	68	TURN OVER	34	SINGLE LEG ATTACK	32	231

When analyzing the frequency of executed actions (Table 8), it can be observed that, based on frequency (considering the three most represented parameters per team), the single-leg attack is the most commonly applied technique across all national teams, with a total of 11 occurrences. The only exception is the U20 category, where the single-leg attack does not appear among the top three techniques.

The second most frequent technique is the turnover, with a total of 10 occurrences. An exception is observed in the senior category, where this technique does not rank among the top three techniques in any national team.

In third place is the takedown, with a total of 7 occurrences. Notably, this technique ranks first in the Indian team (U23) and the UWW team (U17).

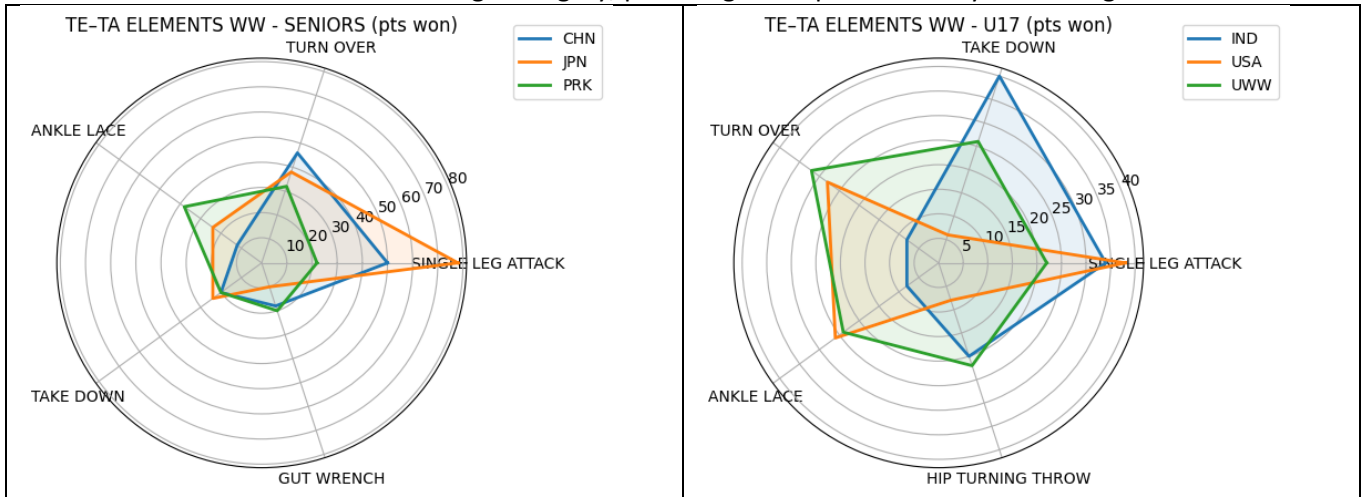
When considering the total number of points scored, the single-leg attack stands out significantly, with a total of 448 points. It is followed by the turnover with 360 points, and the takedown ranks third with a total of 258 points.

Table 8. Frequency and points scored for the first, second, and third most used techniques across all age categories.

Rb	Technics (ENG)	I best technique		II best technique		III best technique		TOTAL frekv.	TOTAL points
		Frek.	Poeni	Frek.	Poeni	Frek.	Poeni		
1.	SINGLE LEG ATTACK	4	224	4	132	3	92	11	448
2.	TURN OVER	3	118	5	178	2	64	10	360
3.	TAKE DOWN	2	108	4	130	1	20	7	258
4.	ANKLE LACE	3	144	0	0	2	50	5	194
5.	TAKE DOWN HEAD TO HEAD	0	0	0	0	2	36	2	36
6.	FORWARD BENDING THROW	0	0	1	24	1	28	2	54
7.	GUT WRENCH	0	0	0	0	1	28	1	28

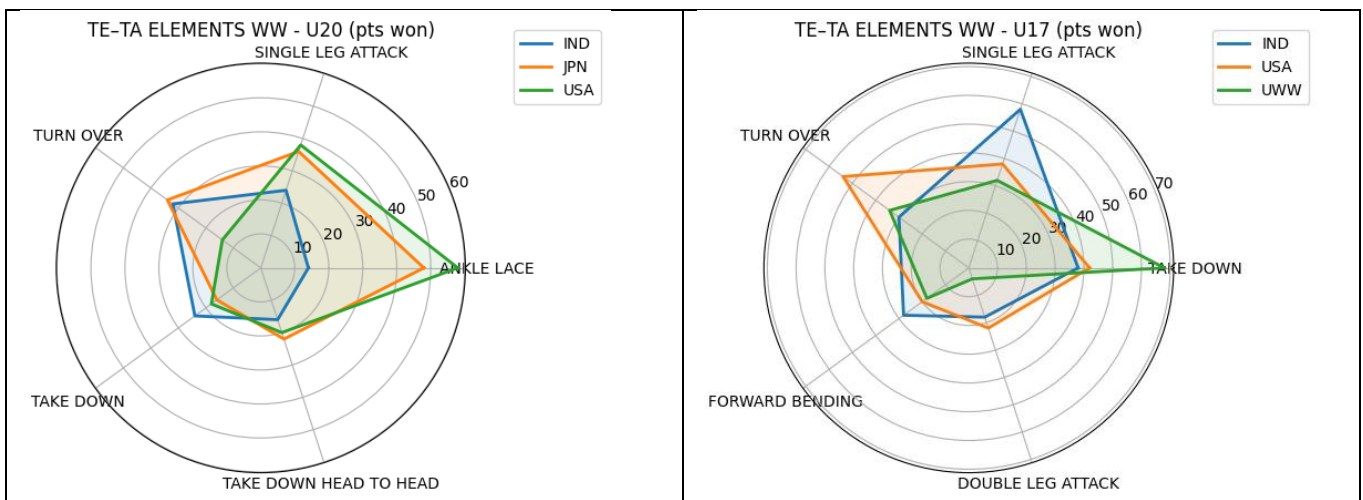
Comparative Analysis of Wrestling Techniques by Age Category

Figures 9, 10, 11, and 12 at the end of this chapter present data separately by wrestling techniques, along with the three most successful nations in each age category, providing a comparative analysis in a single overview.



Graph 10. Visual Comparison – senior

Graph 11. Visual Comparison – U23



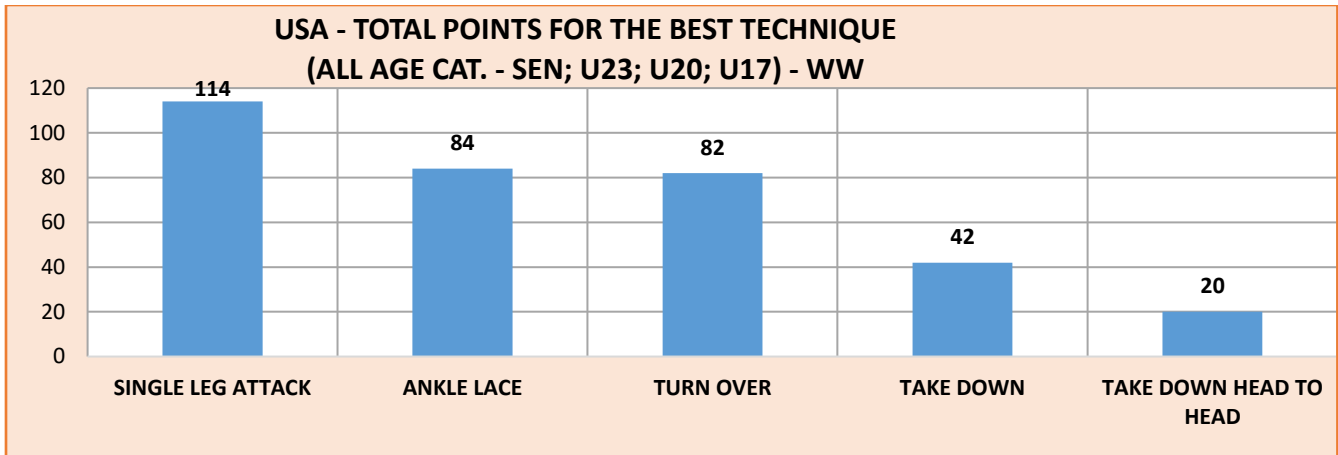
Graph 12. Visual Comparison – U20

Graph 13. Visual Comparison – seniori

USA

The highest number of points was scored using the single-leg attack across three age categories (U23, U20, U17), totaling 114 points, confirming that it is the most frequently used technique in women's wrestling (WW) across all age groups.

In second place is the ankle lace with 84 points, followed by the takedown with 82 points. These are the three most commonly executed techniques by USA wrestlers across all three wrestling styles and all four age categories at the 2025 World Championships (Figure 13).

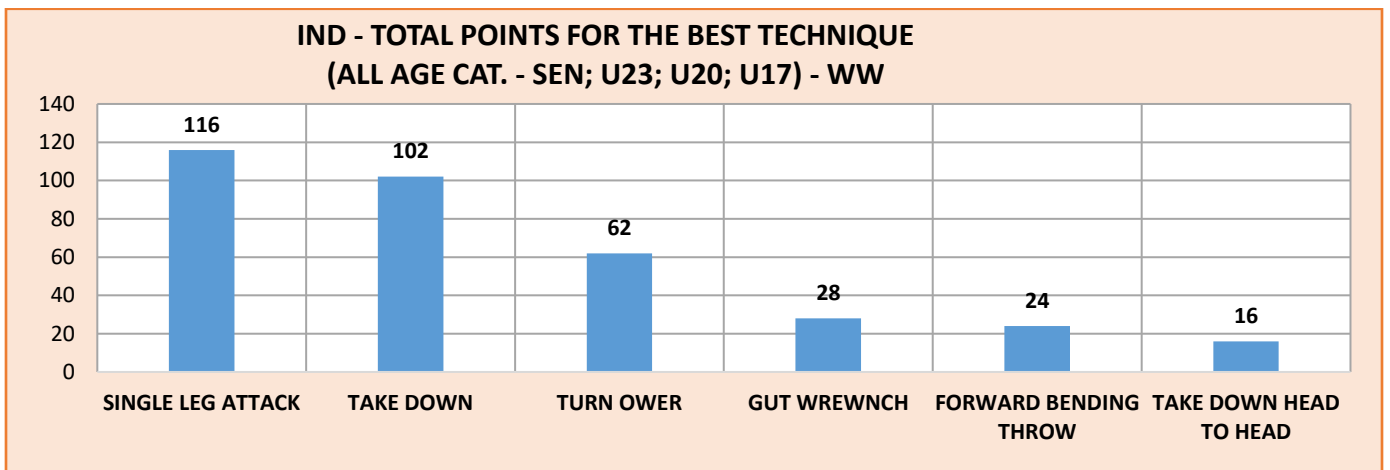


Graph 14. Total Points for Top Techniques (All Age Categories: SEN, U23, U20, U17) – USA

IND

The highest number of points was scored using the single-leg attack across three age categories (U23, U20, U17), totaling 116 points, confirming that it is the most frequently used technique in women's wrestling (WW) across all age groups.

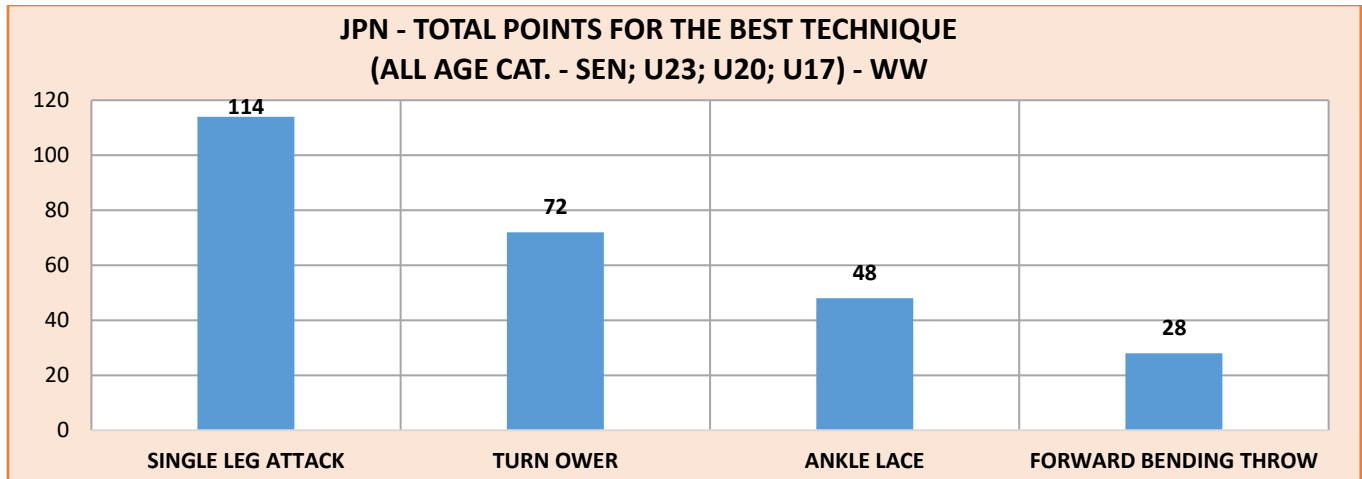
In second place is the takedown with 102 points, followed by the turnover with 62 points. These are the three most commonly executed techniques by Indian wrestlers across all three wrestling styles and all four age categories at the 2025 World Championships (Figure 14).



Graph 15. Total Points for Top Techniques (All Age Categories: SEN, U23, U20, U17) – IND

The highest number of points was scored using the single-leg attack across three age categories (U23, U20, U17), totaling 114 points, confirming that it is the most frequently used technique in women’s wrestling (WW) across all age groups.

In second place is the turnover with 72 points, followed by the ankle lace with 48 points. These are the three most commonly executed techniques by Japanese wrestlers across all three wrestling styles and all four age categories at the 2025 World Championships (Figure 15).



Graph 16. Total Points for Top Techniques (All Age Categories: SEN, U23, U20, U17) – JPN

An interesting finding is that wrestlers from the three most successful nations, based on total points scored, achieved nearly identical results using the single-leg attack technique: USA – 114, IND – 116, and JPN – 114. This highlights the dominant role of this technique in women’s wrestling (WW).

8. Overview of the Percentage Distribution of Points: “All Matches”, “Medal Matches (Final I–II, III–V)”, “All Matches of Winners – Gold Medalists”

The analysis of matches by competition phases (“all matches,” “medal matches I–II and III–V,” and “all matches of winners – gold medalists”) in women’s wrestling (WW) shows that the single-leg attack is the most frequently executed technique across all phases and age categories, appearing in all 12 analyzed segments (Table 9). It accounts for an average of 17.24% of all points scored across all age categories and all three competition phases analyzed separately.

The highest percentage shares of points for the three most frequently executed techniques across all competition phases and age categories are presented in Table 9:

- The highest share of points scored using the single-leg attack in medal matches was recorded among gold medalists in the senior category, accounting for 24.90% of points.
- The highest share of points for takedowns was recorded in the U17 category across all matches, accounting for 20.11% of points.

- The highest share of points scored using turnovers was recorded in the U23 category in medal matches (I–II and III–V places), accounting for 16.13% of points.

Table 9. Overview of the percentage distribution of points: “all matches”, “medal matches (Final I–II, III–V)”, and “all matches of winners – gold medalists”.

AGE CAT.	COMPETITION PHASE	%,	I best techniques	%,	II best techniques	%,	III best techniques
		points		points		points	
SENIOR	ALL MATCHES	16.73	SINGLE LEG ATTACK	13.84	TURN OVER	11.22	TAKE DOWN
	MEDALS MATCHES	24.90	SINGLE LEG ATTACK	17.12	TAKE DOWN	10.12	TURN OVER
	MATCHES WINNERS	19.45	SINGLE LEG ATTACK	14.96	TURN OVER	11.47	ANKLE LACE
U23	ALL MATCHES	12.96	SINGLE LEG ATTACK	12.02	TAKE DOWN	10.99	TURN OVER
	MEDALS MATCHES	16.13	TURN OVER	14.84	TAKE DOWN	14.19	SINGLE LEG ATTACK
	MATCHES WINNERS	14.93	TURN OVER	13.87	SINGLE LEG ATTACK	11.20	DOUBLE LEG ATTACK
U20	ALL MATCHES	13.60	SINGLE LEG ATTACK	13.41	TURN OVER	10.18	FORWARD BENDING THROV
	MEDALS MATCHES	15.89	TURN OVER	13.25	TAKE DOWN	8.61	TAKE DOWN HEAD TO HEAD
			SINGLE LEG ATTACK				
ALL MATCHES	16.69	SINGLE LEG ATTACK	19.56	ANKLE LACE	13.47	TURN OVER	
U17	ALL MATCHES	20.11	TAKE DOWN	16.21	SINGLE LEG ATTACK	14.84	TURN OVER
	MEDALS MATCHES	19.92	SINGLE LEG ATTACK	18.33	TAKE DOWN	12.75	TURN OVER
	MATCHES WINNERS	22.46	SINGLE LEG ATTACK	16.04	TAKE DOWN	14.97	ANKLE LACE

GREEN

Highest percentage of points by wrestling techniques (5 highest values)

Based on the data presented in Table 9, it can be concluded that the dominant wrestling techniques across all competition phases are:

- takedown – 20.11% in all matches,
- single-leg attack – 24.90% in medal matches and 19.45% in matches of gold medalists,
- turnover – 15.89% in all matches.

When analyzing the frequency of executed actions (Table 10), it is evident that, based on frequency (considering the three most represented parameters in terms of technical and non-technical scoring), the single-leg attack is the most commonly applied technique across all competition phases, with a total of 12 occurrences. It is followed by the turnover with 11 occurrences and the takedown with 8 occurrences.

Table 10. Overview of the frequency of the 1st, 2nd, and 3rd most frequent techniques for all matches, medal matches, and all matches of the winners.

Sn	TECHNIQUE	I best technique	II best technique	III best technique	TOTAL
1.	SINGLE LEG ATTACK	9	2	1	12
2.	TURN OVER	3	3	5	11
3.	TAKE DOWN	1	6	1	8
3.	ANKLE LACE		1	2	3
4.	TAKE DOWN HEAD TO HEAD			1	1
5.	FORWARD BENDING THROV			1	1
6.	DOUBLE LEG ATTACK			1	1

9. Execution of Techniques According to Time Parameters (All Matches)

The analysis of technique execution based on time parameters was conducted for the three wrestling techniques that generate the highest number of points across all matches (Table 11). This segment of the match should be considered separately for the Senior, U23, and U20 age categories, where matches last 6 minutes (360 seconds), compared to the U17 category, where matches last 4 minutes (240 seconds).

Overview of the highest number of points scored using the single-leg attack by age category and minute of the match:

- U17: first minute of the match – 106 points
- Seniors: second minute of the match – 72 points
- U20: first minute of the match – 72 points
- U23: second minute of the match – 62 points

Table 11. Time parameters of technique execution by age categories (all matches).

AGE CAT.	0-360 seconds	1-Nbr. points	I best technique	2-Nbr. points	II best technique	3-Nbr. points	III best technique
SEN	0-60 seconds	64	SINGLE LEG ATTACK	46	TAKE DOWN	42	HIP TURNING THROW
	61-120 seconds	72	SINGLE LEG ATTACK	52	HIP TURNING THROW	40	ACIVITY TIME
	121-180 seconds				TURN OVER		
	121-180 sekundi	60	SINGLE LEG ATTACK	58	ANKLE LACE	50	TAKE DOWN
	181-240 seconds	58	TURN OVER	54	SINGLE LEG ATTACK	42	TAKE DOWN
	210-300 seconds	62	SINGLE LEG ATTACK	52	TURN OVER	36	TAKE DOWN
	301-360 seconds	58	SINGLE LEG ATTACK	54	TURN OVER	42	TAKE DOWN
61-120 seconds							
U23	0-60 sekundi	64	GUT WRENCH	54	SINGLE LEG ATTACK	44	ANKLE LACE
	121-180 seconds	62	SINGLE LEG ATTACK	54	HIP TURNING THROW	44	TURN OVER
	121-180 sekundi						TAKE DOWN
	181-240 seconds	57	ACIVITY TIME	46	TAKE DOWN	44	TURN OVER
	210-300 seconds	46	SINGLE LEG ATTACK	44	TURN OVER	32	TAKE DOWN
	301-360 seconds	58	TAKE DOWN	40	SINGLE LEG ATTACK	29	ACIVITY TIME
	0-60 seconds	44	SINGLE LEG ATTACK	42	TAKE DOWN	33	PARTER COUNTER
61-120 seconds	TURN OVER						
U20	121-180 seconds	72	SINGLE LEG ATTACK	64	ANKLE LACE	56	TAKE DOWN
	181-240 sekundi	86	TURN OVER	54	ANKLE LACE	52	SINGLE LEG ATTACK
	181-240 seconds	50	SINGLE LEG ATTACK	48	TURN OVER	34	TAKE DOWN
	210-300 seconds		ANKLE LACE		FORWARD BEDING THROW		
	0-60 seconds	54	SINGLE LEG ATTACK	36	ANKLE LACE	34	TURN OVER
	61-120 seconds	44	TURN OVER	34	SINGLE LEG ATTACK	30	TAKE DOWN HEAD TO HEAD
	121-180 seconds						
301-360 sekundi	36	TAKE DOWN HEAD TO HEAD	34	TURN OVER	32	SINGLE LEG ATTACK	
U17	121-180 sekundi	92	SINGLE LEG ATTACK	84	TAKE DOWN	72	TURN OVER
	181-240 seconds	100	TAKE DOWN	86	SINGLE LEG ATTACK	78	TURN OVER
	210-300 seconds	90	TAKE DOWN	72	SINGLE LEG ATTACK	70	TURN OVER
	301-360 second	106	TAKE DOWN	62	TURN OVER	58	SINGLE LEG ATTACK
	0-60 seconds	X	X	X	X	X	X
	61-120 seconds	X	X	X	X	X	X

GREEN The most points and the best technique by age category

General Conclusion for Time Parameters

Kao što se može videti u Grafikonu 16. najveći broj poena u sve 4 uzrasne kategorije **osvaja se u drugoj minuti meča**.

The second-highest number of points across all four age categories is scored in the first minute of the match. Based on the data from Table 11 and Figure 16, it can be concluded that in the final minute of the match (4th minute in U17; 6th minute in other categories), wrestlers score the highest number of points in the second period, particularly in the last minute.

This is expected, as in the final minute wrestlers tend to attempt a greater number of actions in order to overcome a deficit in the score. An exception is observed in the U20 category, where the highest number of points is scored in the second period during the fifth minute of the match.

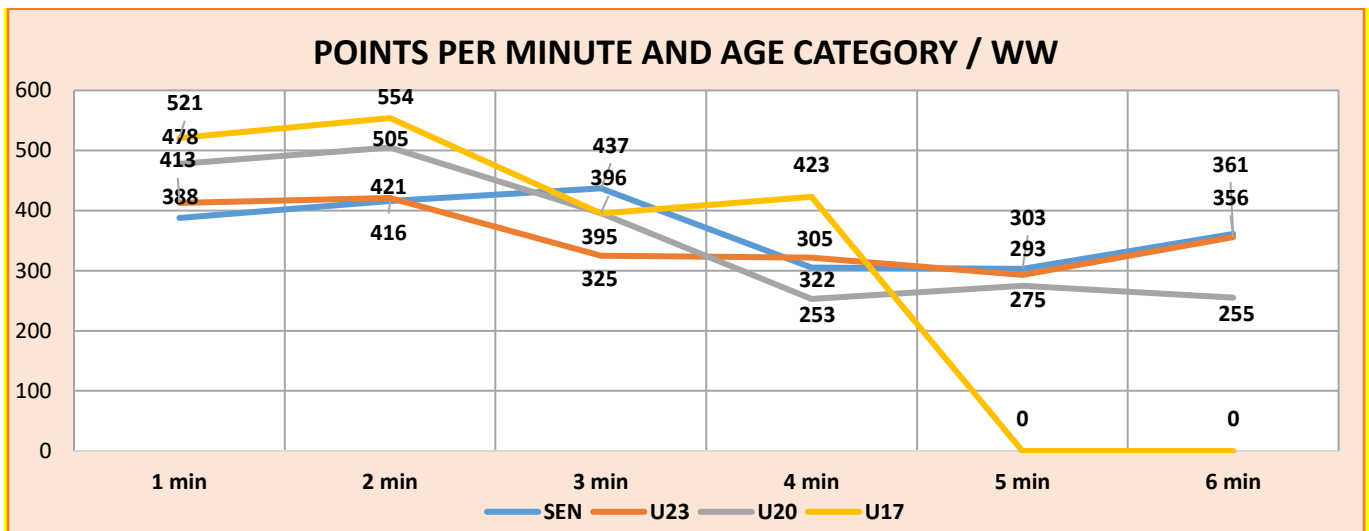


Figure 17. Total points scored per minute of the bout: Senior, U23, U20, and U17.

First Minute of the Match

Across all analyzed segments in the first minute (considering the top three techniques per minute of combat) and across all four age categories, the highest number of points was scored using the following wrestling techniques:

- single-leg attack – 282 points (4 age categories)
- takedown – 186 points (3 age categories)
- ankle lace – 108 points (2 age categories)
- turnover – 72 points (1 age category)
- gut wrench – 64 points (1 age category)
- hip turning throw – 42 points (1 age category)

A total of 754 points were scored using 6 wrestling techniques.

Second minute of the match

Across all analyzed segments in the second minute, the highest number of points was scored using:

- single-leg attack – 272 points (4 age categories)
- turnover – 260 points (4 age categories)
- takedown – 154 points (2 age categories)
- hip turning throw – 106 points (2 age categories)
- ankle lace – 54 points (1 age category)
- activity time – 40 points (1 age category)

A total of 886 points were scored using 6 techniques.

Third minute of the match

Across all analyzed segments in the third minute, the highest number of points was scored using:

- takedown – 220 points (4 age categories)
- turnover – 212 points (4 age categories)
- single-leg attack – 182 points (3 age categories)
- ankle lace – 108 points (2 age categories)
- activity time – 57 points (1 age category)
- forward bending throw – 48 points (1 age category)

A total of 827 points were scored using 6 techniques.

Fourth minute of the match

Across all analyzed segments in the fourth minute, the highest number of points was scored using:

- single-leg attack – 212 points (4 age categories)
- turnover – 198 points (4 age categories)
- takedown – 180 points (3 age categories)
- ankle lace – 36 points (1 age category)

A total of 626 points were scored using 4 techniques.

Fifth minute of the match

Across all analyzed segments in the fifth minute (3 age categories), the highest number of points was scored using:

- single-leg attack – 136 points (3 age categories)
- turnover – 96 points (2 age categories)
- takedown – 94 points (2 age categories)
- head-to-head takedown – 30 points (1 age category)
- activity time – 29 points (1 age category)

A total of 385 points were scored using 5 techniques.

Sixth minute of the match

Across all analyzed segments in the sixth minute (3 age categories), the highest number of points was scored using:

- single-leg attack – 134 points (3 age categories)
- turnover – 132 points (3 age categories)
- takedown – 84 points (2 age categories)
- head-to-head takedown – 36 points (1 age category)
- parterre counter – 33 points (1 age category)

A total of 419 points were scored using 5 techniques.

10. Most Successful Wrestler (MSW)

Based on the analysis of the most successful champions by age categories, data were obtained identifying the most successful wrestlers according to six key criteria:

- number of points scored relative to total match duration;
- number of classification points conceded relative to the total number of matches;
- number of points scored relative to total match duration;
- number of classification points conceded relative to the total number of matches;
- total duration of all matches of the champion;
- total number of matches of the champion.

Across the four age categories, wrestlers from Japan (JPN) and the USA proved to be the most successful, dominating all four categories (Table 12).

Based on the MSW index analysis, the most successful wrestler was Onishi Sakura (JPN), who achieved the best results in two age categories (Seniors and U20). Notably, Onishi Sakura recorded the highest MSW index at the U20 World Championships across all age categories and all three Olympic wrestling styles (GR, FS, and WW).

Onishi Sakura delivered exceptional performance at the U20 World Championships. Her MSW index reached 11.41. She competed in four matches with a total duration of just 5.24 minutes, during which she scored 40 technical points without conceding a single point. Additionally, she earned 16 classification points without losing any, meaning that she won all four matches by technical superiority.

Table 12. Overview of the most successful wrestler (MSW) by age categories.

AGE CATEGORY	NAME AD SURNAME	NAT	WEIGHT CAT	MSW INDEX
SENIOR	ONISHI SAKURA	JPN	59 kg	7.80
U23	WALKER KYLIE RENEE	USA	76 kg	9.69
U20	ONISHI SAKURA	JPN	59 kg	11.41
U17	TURNER MORGAN NICOLE	USA	49 kg	8.53

11. Champions / Points Scored and Conceded

Tables 13 and 14 present, by age category, which techniques champions used to score and concede the highest number of points, classified as the first, second, and third most successful techniques.

Percentage (%) of points scored by champions:

Across all four age categories, champions scored the highest proportion of points in the Senior and U17 categories using the single-leg attack (18.60% and 23.75%, respectively). In the U23 category, the highest share of points was achieved using the turnover technique (16.61%), while in the U20 category, the highest share came from the ankle lace (17.70%).

Table 13 presents data by age category on points scored by champions through wrestling techniques and other scoring actions, across three levels of contribution expressed as percentages (%):

- **Primary dominant technique:** Across all four age categories, champions scored the highest proportion of points using the single-leg attack, ranging from 23.75% (U17) to 14.70% (U23).
- **Secondary dominant technique:** Across all four age categories, champions in three categories scored a significant portion of points using the ankle lace, ranging from 17.70% (U20) to 9.58% (U23).
- **Tertiary dominant technique:** Across all four age categories, champions in three categories scored points using the turnover technique, ranging from 16.61% (U23) to 12.39% (U20).

Table 13. Overview of the frequency of the 1st, 2nd, and 3rd most successful techniques according to points scored.

AGE CAT	POINTS CONCEDED	1.-%	I best technique	2.-%	II best technique	3.-%	III best technique
SENIORI	POINTS CONCEDED	18.60	SINGLE LEG ATTACK	14.53	TURN OVER	12.79	ANKLE LACE
U23	POBEDNIČKI. POENI	16.61	TURN OVER	14.70	SINGLE LEG ATTACK	9.58	ANKLE LACE
U20	POBEDNIČKI. POENI	17.70	ANKLE LACE	15.93	SINGLE LEG ATTACK	12.39	TURN OVER
U17	POINTS CONCEDED	23.75	SINGLE LEG ATTACK	16.88	ANKLE LACE	14.38	TAKE DOWN

Percentage (%) of points conceded by champions:

Across all four age categories, champions conceded the highest proportion of points in the Senior and U20 categories through the single-leg attack (24.56% and 22.58%, respectively). In the U17 category, the highest share of conceded points resulted from takedowns (25.39%), while in the U23 category, the highest proportion came from activity time (16.13%).

Table 14 presents data by age category on points conceded by champions due to wrestling techniques and other scoring actions, classified into three levels of dominance and expressed as percentages (%):

- **Primary dominant technique:** Across all four age categories, champions conceded the highest proportion of points through the single-leg attack, ranging from 24.56% to 14.81%.
- **Secondary dominant technique:** Across all four age categories, champions in three categories conceded points through takedowns, ranging from 25.39% (U17) to 12.90% (U23).
- **Tertiary dominant technique:** Across all four age categories, champions in three categories conceded points through activity time, ranging from 16.13% (U23) to 9.26% (U17).

Table 14. Overview of the frequency of the 1st, 2nd, and 3rd most significant techniques based on points conceded.

AGE CAT	POINTS CONCEDED	1.-%	I best technique	2.-%	II best technique	3.-%	III best technique
SENIOR	POINTS CONCEDED	24.56	SINGLE LEG ATTACK	14.53	TURN OVER	10.53	GUT WRENCH
U23	IZGUBLJENI POENI	16.13	ACIIVITY TIME	12.90	DOUBLE LEG ATTACK TAKE DOWN	9.68	SINGLE LEG ATTACK
U20	POINTS CONCEDED POINTS CONCEDED	22.58	SINGLE LEG ATTACK	19.35	TURN OVER	12.90	SUPLEX THROW FORWARD BENDING THROW
U17	IZGUBLJENI POENI	25.39	TAKE DOWN	14.81	SINGLE LEG ATTACK TURN OVER	9.26	ACTIVITY TIME

Frequency of Techniques Executed by Champions

Points Scored

Based on frequency (considering the three most represented outcomes in terms of technical and non-technical scoring), across all age categories, the single-leg attack is the dominant standing technique used by champions to score points in all their matches, with 4 occurrences.

The techniques through which champions score the most points in the parterre position are the turnover and the ankle lace, each with a total of 7 occurrences (Table 15).

Table 15. Overview of the frequency of the 1st, 2nd, and 3rd most executed techniques in all matches of gold medalists – Points Scored

WIN POINTS	RVAČKA TEHNIKA	I najzastupljenija tehnika	II najzastupljenija tehnika	III najzastupljenija tehnika
	SINGLE LEG ATTACK	2	2	
TURN OVER	1	1	1	
ANKLE LACE	1	1	2	
TAKE DOWN			1	

Points Conceded

Based on frequency (considering the three most represented outcomes in terms of technical and non-technical scoring), across all age categories, champions conceded the most points in all their matches due to turnovers and single-leg attacks.

The second most frequent source of conceded points is the takedown, with 2 occurrences (Table 16).

Table 16. Overview of the frequency of the 1st, 2nd, and 3rd most executed techniques in all matches of gold medalists – Points Conceded

LOST POINTS	WRESTLING TECHNIQUE	I - most frequently used technique	II - most frequently used technique	III - most frequently used technique
	TAKE DOWN	2		
SINGLE LEG ATTACK	1	1	1	
TURN OVER			3	
SUPLEX THROW			1	
GUT WRENCH			1	
ACTIVITY TIME	1		1	
DOUBLE LEG ATTACK			1	
FORWARD BENDING THROW			1	

KEY CONCLUSIONS

1. **Wrestling efficiency (WQ) decreases with age (higher age categories).** Wrestlers in the U17 category demonstrated the highest efficiency (points per minute) – WQ/min 2.73, with a statistically significant decline toward the senior category – WQ/min 2.00. From U20 to Seniors, match intensity remains relatively stable, indicating a transition from a high-tempo style with frequent throws to a more controlled and strategically oriented approach.
2. **Standing wrestling remains dominant across all age categories.** In all age groups, the majority of points are scored from the standing position. In U23, Seniors, and U17, approximately 68% of points come from standing techniques. In contrast, the U20 category shows the highest proportion of points scored in the parterre position (35.15%).
3. **Technical points show stable patterns across all four age categories.** There are minimal deviations, with the only slight variation observed in U23, where 13.76% of points come from non-technical actions.
4. **Differences in wrestling techniques across age categories.** Three techniques stand out with the highest share of points (above 10%): single-leg attack, turnover, and takedown. These techniques show very small deviations across age groups, except in U17, where the takedown stands out with 20.11%.
5. **Scoring the first point significantly influences match outcome.** Across all age categories, wrestlers who scored the first point had a significantly higher probability of winning (70.3%, or approximately 5.6 times greater odds of victory).
6. **Time-based match analysis highlights key scoring techniques.** Three techniques dominate in terms of points scored across different minutes of the match. The single-leg attack is the leading technique, appearing 12 times as the highest-scoring action across all four age categories. It is followed by takedown and turnover, each appearing 4 times. These findings should be carefully considered in training planning.
7. **Key characteristics of champion performance.** Champions achieve success primarily through frequent use of the following techniques:
 - single-leg attack,
 - ankle lace,
 - turnover.The techniques through which they most often concede points are:
 - single-leg attack,
 - activity time,
 - takedown,
 - turnover.These findings provide a basis for developing a technical-tactical model of elite wrestling performance.

RECOMMENDATIONS FOR UWW AND WRESTLING COACHES

Strategic implications for UWW

- Competition analysis should be integrated into coach education programs to support evidence-based decision-making.
- These and similar analyses can serve as valuable tools for modifying wrestling rules, particularly to reduce passivity points and increase the attractiveness and effectiveness of women's wrestling (WW).
- The data may also contribute to injury prevention and improved athlete safety during matches.

Long-term athlete development

The results confirm that competitive development in WW follows a non-linear pathway, with a clear transitional phase around the age of 20. Training models should be adapted to the specific demands of each age and weight category, rather than prematurely applying senior-level expectations (e.g., early specialization in U17).

Coaching focus by age category

- **U17** – Encourage offensive initiative and high match tempo; accept variability and errors as part of development; emphasize technical diversity and avoid early specialization rather than focusing on results.
- **U20** – Gradually reduce unnecessary “point losses” and develop match control skills.
- **U23** – Improve efficiency of key techniques (specialties) and emphasize rhythm and tempo control.
- **Seniors** – Focus on precision, timing, and efficiency; capitalize on opportunities to score the first point; maintain balance between standing dominance and parterre efficiency. Special attention should be given to reaction speed for defending single-leg attacks.

Training focus

- **Scoring the first point** – Practice pre-planned opening actions (e.g., attacks to one or both legs within the first 30–40 seconds).
- **Mat control and step-out situations** – Use reduced training areas to improve spatial control and simulate step-out scenarios.
- **Perfection of dominant techniques** – Increase repetitions and individual practice of key techniques in both standing and parterre positions.
- **Match management and tempo control** – Simulate match scenarios with predefined scores (e.g., 4:0 or 1:1) to practice leading and chasing situations.
- **Minimizing technical errors** – Use video analysis to identify critical mistakes and focus training on correcting them.

Training methodology

- High-specific sparring simulations of tournament systems (including controlled rest intervals).
- Targeted micro-analysis of matches and simulation of opponent-specific tactics.
- Individualized technical programs based on athlete characteristics.
- Emphasis on energy efficiency and recovery (active recovery, stretching, pool, sauna, massage).

Development of key technical segments

Priority techniques (all age categories):

- single-leg attack
- ankle lace
- turnover
- takedown

Training should focus on improving execution success rate, developing multiple entries and variations of key techniques, and linking techniques into combinations.

Training for scoring the first point

- Plan aggressive opening actions within the first minute (especially between 45–75 seconds).
- Develop tailored “start strategies” for different opponent types.
- Simulate match openings repeatedly (first 10–15 seconds).
- Develop aggressive hand control and close-contact (clinch) control.

Development of standing wrestling and mat control

- Emphasize footwork, distance control, and reaction speed (especially in younger categories).
- Train step-out tactics (both offensive and defensive).
- Use situational sparring in reduced space.
- Focus on mastering single-leg attacks and selected takedown variations.

Development of parterre performance

Although slightly lower, parterre scoring still accounts for 31–35% of points in WW:

- Each wrestler should master at least two parterre techniques.
- Develop defense against ankle lace and turnover.
- Emphasize static and dynamic strength development, especially in U17.

Age-specific conditioning

- **U17** – General motor skills, speed, agility
- **U20** – Maximum strength and explosiveness
- **U23** – Specific endurance and strength
- **Seniors** – Energy efficiency and optimal recovery

Tactical education

- Systematic use of video analysis
- Individual tactical planning
- Opponent analysis
- Match-specific strategy development
- Integration of AI tools for opponent-specific preparation

Long-term development organization

- Progress from technical diversity to tactical efficiency
- Avoid premature application of senior models (especially in U17)
- Ensure individualization based on athlete and weight category

Organization of the training process

- Gradual progression of training load from U17 to Seniors
- Balance between technical, tactical, and physical training
- Individual development plans for each athlete
- Continuous performance evaluation throughout the career

Role of the coach

The coach must:

- Monitor athlete condition through testing
- Plan long-term development
- Individualize training as much as possible
- Continuously analyze performance (own athlete and opponents)
- Develop and monitor psychological stability
- Engage in continuous professional development across all aspects of training and competition