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The physical preparation and testing in elite youth wrestling in Albania

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Abstract: The Success of Albanian Wrestling: We will address the general and special physical condition of our young wrestlers according to the demands of the current times and our wrestling sport. This study focuses on organizing and implementing an active and specific training methodology aimed at the complex development and progressive rhythms of the training indicators for young wrestlers. It includes the creative processing of positive experiences, which is accompanied by systematic analytical activity and the constructive processing of a wide range of contemporary literature. The study presented is the product of an experimental process organized with athletes from our national wrestling team for youth. Data processing was carried out using SPSS27. F.max relative: This is the maximum relative strength. P.max.rel/p/kg: This is the relative power per kg/body weight. The duration of the support with both feet on the ground is crucial; the faster it is completed, the better. The complex, dynamic, standardized, and overload-free training increases the physical, movement, and functional standards of the wrestlers. The content of training units should emphasize special and specific elements, supplemented with exercises for strength, speed, and coordination. The training activity should be based on the structure of 'macro-cycles.'

Keywords: *Drop jump, VO_2 max, Speed, Functional condition, Physical-motor indicators.*

1. Introduction

Wrestling can be defined as the struggle of two wrestlers to gain superiority through technique, skills, strength, and intelligence in accordance with the rules of the International Wrestling Federation (FILA) [1]. Wrestling, as a sport, is highly dynamic, characterized by sudden explosive attacks and counterattacks that are repeatedly performed with high intensity and alternated with submaximal work for durations of up to 6 minutes [2, 3]. Wrestling, as a sport, is highly dynamic, characterized by sudden explosive attacks and counterattacks that are repeatedly performed with high intensity and alternated with submaximal work for durations of up to 6 minutes [2, 3].

In wrestling, as in many other sports, energy systems (anaerobic and aerobic) are employed to a various degree [4]. The anaerobic system provides quick bursts of maximal power during the match, while the aerobic system contributes to the wrestler's ability to maintain effort for the duration of the match and to recover between periods [5]. The physiological demands on wrestlers are complex, requiring athletes to have highly developed capacities of maximal strength, agility, flexibility, muscular power, strength endurance, oxidative capacity, anaerobic capacity, and power [6-8]. Furthermore, understanding the physical and physiological factors contributing to successful wrestling is one of the challenges that coaches and wrestlers confront with Mirzaei, et al. [3]. Of note, periodic changes in wrestling rules by united world wrestling (UWW) may also influence the methods of training used by successful wrestlers [9] Most often, the authors focused on the assessment of physical fitness using various research methods and tools [10-12].

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In many studies that simultaneously analyzed the physiological, anthropometric factors and specific skills and technical skills of wrestling of different weight classes, the traditional analytical method was applied [13-16]. Specific Wrestling Performance Test (SWPT) consisting of two 3-minute segments [17, 18]. Surprisingly, many researchers often overlooked some important components of athletic preparation, such as sport-specific skills. It is well-known that physical and technical wrestling skills are crucial for the profiles of successful wrestlers [19, 20].

1.1. Study Objective

The objective of this study focuses on the organization and implementation of an active and sport-specific training methodology aimed at the complex development and progressive rhythm of fitness indicators in young wrestlers. The study focuses on the specific characteristics of the training methodology, which is primarily centered on the application of interval and circuit training methods as high-performance strategies for preparing the power and movement coordination components of young wrestlers in anaerobic-lactic conditions of an indoor environment.

1.2. Study Goal

The goal of the study is to standardize and model the training process in a comprehensive way according to specific preparatory cycles, aiming to develop the quality of fitness indicators in line with the physical, physiological, and psychological demands that wrestling requires for youth athletes.

1.3. Study Objectives

The primary objective of this study is achieved through the realization of the following specific goals:

1. Familiarization with the features of the modern development of youth wrestling in the context of Olympic program disciplines, highlighting distinguishing qualities and specific requirements for achieving high performance in physical, functional, coordination, and psychological indicators.
2. Understanding the factors that facilitate the physical and functional development of training loads, focusing on energy mechanisms, adaptation and recovery phenomena, and the effectiveness of training loads according to standards and thresholds.
3. Familiarization with the modern methodology of fitness development, focusing on the specific applications of interval and cyclic training methods in the context of youth wrestling.
4. Creative organization and implementation of the experimental process, in line with the requirements set by the planning and periodization of training, preparation ratios, and the complex exercise conditions, mostly under the anaerobic glycolysis process.
5. Coordination of tasks and training units according to the ratios of the main training types and specific cycles during the key periods and phases of the training year, for the optimal development and dynamic load management during their practical implementation.

1.4. Study Hypotheses

To objectively solve the forecast and expectations of this study, several specific hypotheses were proposed to enable the assessment of the effectiveness and the experimental training process:

1. Complex training with a specific dynamic character, standardized and free from excessive overloads, increases physical-motor and functional standards in young wrestlers.
2. Interval training, with a strong emphasis on special endurance indicators and various physical-motor and functional elements, accelerates training timelines and has clear advantages over traditional training forms.
3. Supporting the training process through macrocycle structures is the most rational way to develop controlled training loads in collaboration with recovery, preparing and gradually adapting wrestlers towards appropriate fitness and sports performance indicators.

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2. Materials and Methods

A methodology for the development of specific physical training in Greco-Roman wrestling will positively impact the general motor skills of young wrestlers in all aspects of its manifestation [21]. The preparation of this study was based on a specific scientific methodology, which included the following main methods.

The creative processing of positive experience was the preliminary method for drafting this study, which was accompanied by a systematic analytical activity for the constructive processing of a large body of contemporary literature.

2.1. Experimentation Method

The presented study is the result of an experimental process organized with wrestlers from our national youth team, within the period of November 2023 - May 2024. During this process, the entire youth national team was involved, with a focus on 9 of the most talented athletes.

The experimental process focused on organizing and implementing a complex methodology, supported by the specific structures of macrocycles with "peaks." Throughout the annual cycle, each macrocycle would be structured into three main training periods (general, competitive, and transitional), ordered as follows: entry stages, general preparation, special preparation, competition, and transitional stages, according to the relevant macrocycles.

2.2. Testing Method

The testing method was organized based on the full range of tests applied during the training process for monitoring and evaluating changes during the development of training loads, highlighting their effectiveness.

The testing method was organized in the following main directions:

- Testing through the "Leonardo" platform
- Testing of functional condition
- Testing with general physical-coordination exercises

2.3. Testing through the "Leonardo" Platform

Testing through the "Leonardo" platform was used to assess physical indicators, particularly those related to strength, power, and coordination skills.

2.4. Functional Condition Testing

Functional condition testing was organized through a VO_2 Max measurement test (ml/kg/min) using an ergometer bicycle. One of the tests applied was the Astrand-Ryening-Monark Test Report.

2.5. General Physical-Coordination Exercise Testing

In general physical and coordination testing, exercises were selected that correspond to the technical and physical demands of wrestling, some of which are described in the EUROFIT test and other training programs, such as:

- 30m and 50m sprints from a standing start to assess speed;
- Standing long jump with both feet (SLO) to assess explosive strength and movement coordination;
- Pull-ups on a high bar (SBF) to evaluate upper body strength, etc.
- Trunk rotation (RSA) with a 5kg weight on the chest to assess strength in the midsection.
- Parallel bar push-ups to assess upper body strength;
- The specific performance of wrestling in doll throws (2x3min). The test consists of 2 periods of 3 minutes each, simulating one round in a match, with a 30-second break between each round.
- VO_2 max (via ergometer bicycle) using the Astrand-Ryening-Monark Test Report.

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2.6. Statistical Analysis and Processing

The data from the tests underwent statistical processing to highlight the achievements in the physical and coordination indicators of the team's wrestlers, focusing on their basic physical and coordination abilities.

2.7. Systematization and Concrete Presentation

Systematization and concrete presentation aimed at strengthening the argumentative force of the issues and parts of the study by presenting them in the most concrete and understandable manner.

The use of physical preparation tests can provide valuable information on the physical qualities of wrestlers

3. Results

3.1. Achievement of Study Objectives

The study objectives group included:

- Achievement in physical-movement indicators;
- Achievements on the "Leonardo" platform;
- Achievements in indicators of functional status.

3.2. Achievements in Physical-Movement Indicators

The achievement in physical-movement and functional indicators focuses on basic movement, functional, technical, and coordination objectives. For this purpose, specific tests were used, which included the following exercises:

- 30-50m sprints from a standing start, to assess speed, in seconds.
- Long jump with both feet from a standing position, to assess speed, measured in meters and full centimeters.
- Pull-ups on a bar, to assess arm strength and muscle endurance, in repetitions.
- Chest-to-knee touches (RSA, with a 5kg barbell disc on the chest), to assess strength in the midsection, in repetitions for 30 seconds.
- Parallel bar push-ups, to assess arm strength, in repetitions.
- The specific performance of wrestling in doll throws (2x3min). The test consists of 2 periods of 3 minutes each, simulating one round in a match, with a 30-second break between each round.
- VO_2max, to assess functional preparation, in ml/kg/min (Astrand Test) – Table 1
  Wrestling is a sport requiring predominantly anaerobic action and demands aerobic system's contributions to support wrestler's efforts [22].

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Table 1.
Achievements in physical indicators – dynamic and functional with VO_2 max.

Nr	Name - Surname	Objective	30 m (sek)	50 m (sek)	Distance from the spot	Pull-ups	RSA (30")	Parallel Bars	$V0_2$ max	The specific performance of wrestling, number of throws.
1	A.B	Previous	4.25	7	2.35	13	27	32	48.2	73
		Objective	4.1	6.8	245	15	30	35	52	75
		Achievement	4.1	6.7	2.49	16	31	35	53.3	77
		Change	0.15	0.3	14	3	4	3	5.1	4
2	S.E	Previous	4.32	7.2	2.35	11	24	22	42.1	69
		Objective	4.2	7	2.45	13	26	24	45	72
		Achievement	4.15	6.9	2.48	14	27	25	44.6	74
		Change	0.17	0.3	14	3	3	3	2.5	5
3	A.L	Previous	4.3	7.1	235	11	29	20	41.8	71
		Objective	4.2	6.8	2.5	13	31	22	44	74
		Achievement	4.2	6.8	2.49	1 3	32	23	43.6	76
		Change	0.1	0.3	14	2	3	3	1.8	5
4	M.G	Previous	4.22	7,0	2.46	14	25	40	41.2	72
		Objective	4.1	6.8	2.55	16	27	42	44	75
		Achievement	4.1	6.7	256	15	28	43	44.3	76
		Change	0.12	0.3	12	1	3	3	3.1	4
5	K.O	Previous	4.3	7.1	2.45	11	29	22	40.6	68
		Objective	4.2	6.8	2.55	14	33	25	44	70
		Achievement	4.2	6.8	2.57	15	32	26	43.4	72
		Change	0.1	0.3	12	4	3	4	2.8	4
6	DH.Y	Previous	4.4	7.1	2.35	10	25	17	41.5	66
		Objective	4.2	6.9	2.45	12	27	19	44	70
		Achievement	4.18	5.8	2.48	13	28	21	43.8	72
		Change	0.22	0.3	13	3	4	4	2.3	6
7	B.A	Previous	4.4	7.1	2.35	12	28	24	44.2	72
		Objective	4.2	6.9	2.45	14	30	27	47	75
		Achievement	4.15	6.9	2.47	14	30	27	47.6	77
		Change	0.25	0.2	12	2	2	3	3.4	5
8	T.M	Previous	4.2	7	2.33	9	20	13	40.1	68
		Objective	4.1	6.8	2.48	10	23	15	44	72
		Achievement	4.1	6.7	2.47	11	23	16	42.4	74
		Change	0.1	0.3	14	2	3	3	2.3	6
9	K.G	Previous	4.2	7	2.55	11	26	20	38.8	67
		Objective	4.1	6.8	2.7	14	28	22	42	70
		Achievement	4.1	6.7	2.71	14	29	23	41.2	73
		Change	0.1	0.3	15	3	3	3	2.4	6

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Averages	Previous	4.29	7.07	2.4	11.8	25.89	23.34	41.6	69.55
Averages	Objective	4.16	6.85	2.51	13.8	28.34	24.45	44.4	72.55
Averages	Achievement	4.15	6.78	2.53	13.92	28.89	25.45	44.2	74.55
Change	Change	0.14	0.29	13	2.75	3	2.11	2.6	5
Result Increase (%)		3.27 %	4.11 %	5.14 %	15.44 %	10.39 %	8.29 %	5.52 %	6.7 %

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3.3. Achievements on the "Leonardo" Platform

As mentioned in the study section discussing the training objectives in wrestling, the "Leonardo" platform has been of considerable help in controlling and assessing training indicators. This sophisticated equipment has enabled the collection of accurate data for evaluating strength indicators, explosive strength, coordination, and spatial and temporal reaction, all of which are highly preferred indicators for modern wrestling.

- DJ: DROP JUMP (Two-legged jump on the ground):
  A single two-legged jump, after landing on an object at a height of 40 cm.
- S2LJ: SINGLE 2 LEG JUMP (Vertical two-legged jump on the ground, without using the arms):
- Continuous jumps within 10 seconds, with hands placed in the middle.
- Evaluates the correlation between strength and factors such as speed, length, age, weight, as well as explosive strength and coordination levels.
- S2LJ: SINGLE 2 LEG JUMP (Vertical two-legged jump on the ground with the help of the arms):
- A single vertical jump with the assistance of the arms.
- Specifically evaluates relative maximal strength, power, and reaction.
- Achievements in the DROP JUMP Test (Single two-legged jump on the ground, after landing from an object). Table 2

Table 2.
Achievements in the DROP JUMP Test

Nr	**Name - Surname**	**Indicator**	**At the Start**	**Achievement**	**Change**
1	A.B.	Contact time	0.251 s	0.216 s	- 0.04 s
2	S.E.	Contact time	0.262 s	0.212 s	- 0.05 s
3	A.L.	Contact time	0.246 s	0.201s	- 0.05
4	M.G.	Contact time	0.221 s	0.225 s	0.01
5	K.O.	Contact time	0.205 s	0.204 s	-0.01
6	DH.Y.	Contact time	0.207 s	0.187 s	-0.09
7	B.A.	Contact time	0.191 s	0.200 s	+ 0.01 s
8	T.M.	Contact time	0.213 s	0.199 s	-0.02
9	K.G.	Contact time	0.192 s	0.194 s	0.02
Average of indicator		Contact time	0.221s	0.204 s	- 0.017 s (7.7%)

VO

"Contact time: It indicates the duration of the support with both feet on the ground. The faster it is completed, the higher the reaction indicator."

*Results in the S2LJ test; SINGLE 2 LEG JUMP

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Table 3.
Results in the test; S2LJ, SINGLE 2 LEG JUMP: (Horizontal jump with both feet on the ground without the help of the arms);"

Nr	Name - Surname	Indicator	First Measurements	Second Measurements	Change
1	A.B	FFI	106 %	123 %	+ 17 %
		JumpHeight	0.50 m	0.56 m	+ 6 cm
		Efificency	83 %	86 %	+ 3 %
2	S.E	FFI	108 %	112 %	+ 4 %
		Jump Height	0.49 m	0.52 m	+ 3 cm
		Efificency	85 %	90 %	+ 5 %
3	A.L	FFI	104 %	115 %	+ 11%
		JumpHeight	0.44 m	0.48 m	+ 4 cm
		Efificency	86 %	89 %	+ 3 %
4		FFI	106 %	109 %	+ 3 %
		JumpHeight	0.49 m	0.56 m	+ 7 cm
		Efificency	80%	87 %	+ 7 %
5	M.G	FFI	108 %	120 %	+ 12 %
		Jump Height	0.49 m	0.59 m	+ 10cm
		Efificency	82%	98 %	+ 16 %
6	K.O	FFI	93 %	97 %	+ 4 %
		JumpHeight	0.48 m	0.49 m	+ 1 cm
		Efificency	87 %	78 %	- 9 %
7	DH.Y	FFI	102 %	101 %	- 1 %
		JumpHeight	0.47 nt	0.48 m	+ 1 cm
		Efificency	73 %	79 %	+ 6 %
8		FFI	101%	108 %	+ 7 %
		JumpHeight	0.48 m	0.50 m	+ 2 cm
		Efificency	80 %	87 %	+ 7 %
9	B.A	FFI	113 %	115 %	+ 2 %
		JumpHeight	0.52 m	0.56 m	+ 4 cm
		Efificency	110 %	122 %	+ 12 %
"Average 1"		FFI	104.5%	104.5 %	111.12 %
"Average 2"		Jump Height	0.49 m	0.53 m	0.04 m (7.55%)
"Average 3"		Efficiency	85.12 %	90.67 %	5.55% (6.12 %)

VO:

- FFI: Indicates the correlation between strength, height, weight, and age. Increasing values suggest a good level.
- Jump height: This is the indicator of vertical jump height (in meters). Increasing values suggest a good level.
- Efficiency: Shows the relationship between strength and power. Increasing values suggest a good level.

"Results in the test: S2LJ: SINGLE 2 LEG JUMP
(Vertical jump with both feet on the ground with the help of the arms)

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Table 4.
Results in the test: S2LJ; SINGLE 2 LEG JUMP (Vertical jump with both feet on the ground with the help of the arms)"

No	Name-Surname	Indicator	First Measurements	Second Measurements	Difference (#)
1	A.B	F. Max. relative	6.88 * fg	7.43 * fg	+ 0.55 * fg
		P. Max. Rel/pe/kg	78.27 w/kg	94.86 w/kg	+16.59 w/kg
		A. contact time	0.162 s	0.171 s	+0.009 s
2	S.E	F. Max. relative	6.44 * fg	7.12 * fg	+ 0.68 * fg
		P. Max. Rel/pe/kg	76.12 w/kg	79.23 w/kg	+ 3.11 w/kg
		A. contact time	0.178 s	0.174 s	- 0.004 s
3	A.L	F. Max. relative	6.64 * fg	7.24 * lg	+ 0.6 * fg
		P. Max. Rel/pe/kg	72.12 w/kg	79.01 w/kg	+ 6.89 w/kg
		A. contact time	0.185 s	0.182 s	- 0.003 s
4	M.G	F. Max. relative	6.35 * fg	6.39 * fg	+ 0.04 * fg
		P. Max. Rel/pe/kg	80.72 w/kg	82.50 w/kg	+ 1.78 w/kg
		A. contact time	0.187 s	0.176 s	- 0.011 s
5	K.O	F. Max. relative	7.01 * fg	7.43 * fg	+ 0.42 * fg
		P. Max. Rel/pe/kg	80.43 w/kg	81.77 w/kg	+ 1.34 w/kg
		A. contact time	0.189 s	0.189 s	0.00
6	DH.Y	F. Max. relative	6.43 * fg	6.95 * fg	+ 0.52 * fg
		P. Max. Rel/pe/kg	70.78 w/kg	77.94 w/kg	+ 7.16 w/kg
		A. contact time	0.182 s	0.181 s	+ 0.001 s
7	B.A	F. Max. relative	5.88 * fg	6.96 * fg	+ 1.08 * fg
		P. Max. Rel/pe/kg	57.43 w/kg	80.60 w/kg	+ 23.37 w/kg
		A. contact time	0.187 s	0.180 s	- 0.007 s
8	T.M	F. Max. relative	7.03 * fg	7.23 * fg	+ 0.2 * fg
		P. Max. Rel/pe/kg	80.12 w/kg	85.10 w/kg	+ 4.98 w/kg
		A. contact time	0.180 s	0.178 s	- 0.002 s
9	K.G	F. Max. relative	6.66 * fg	7.59 * fg	+ 0.93 * fg
		P. Max. Rel/pe/kg	82.59 w/kg	90.55 w/kg	+ 7.96 w/kg
		A. contact time	0.200 s	0.202 s	+ 0.002 s
Average Results	F. Max. relative	6.60 * fg	7.15 * fg		
Average Results	P. Max. Rel/pe/kg	83.51 w/kg		+ 8.13 w/kg	
				(9.73%)	
Average Results	A. contact time	0.181 s		+ 0.002 s	
				(-1.09%)	

VO:

- F.max.relative: This is the maximum relative strength. The higher the values, the better the indicator.
- P.max.rel/p/kg: This is the relative power per kg/body weight. The higher the values, the better the indicator.
- A. contact time: This indicates the duration of the support with both feet on the ground. The faster it is completed, the better the reaction indicator.

4. Discussion

Wrestling bouts consist of all-out attack actions, defensive struggles, and quick contra-attacks.

Analyzing the data from Table 1 above, it is evident that the entire wrestling team has made progress in all physical, functional, and coordinative indicators. The greatest increase is seen in the RSA indicator, while the smallest improvement is in the 30m segment, where increases are more difficult to achieve. Naturally, in tests with a higher volume of repetitions, the results are more noticeable.

In the future, even though there has been progress, particular attention should be paid, especially in further improving two key indicators – the "standing long jump" and VO_2 max.

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The standing long jump with both feet is a concentric expression of explosive strength, which is essential in wrestling. However, its average value, at 253 cm, is considered sufficient, but it should be at the minimum threshold of 270-275 cm.

These improvements contribute to agility on the mat, especially in the strength of the wrestlers' grips.

Similarly, the VO_2 max indicator is around the "sufficient" threshold. This indicator should be increased, as it is a primary factor in enhancing the functional characteristics of wrestlers. With an average level of 45.05 ml/kg/min, it should rise to at least 55-60 ml/kg/min. In such conditions, the capacity for qualitative training sessions will increase, allowing for greater training loads and continuous progress.

Analyzing the data from Table 2 above, there is a general increase in the "drop jump" indicator (a jump with both feet from a height of 40 cm). The average change is -0.017 sec (or 7.7%). Three individuals show negative values, such as M.G and B.A., at +0.01 sec and K.G. at +0.02 sec. The rest of the individuals, especially DH.Y., have made notable progress, with changes of -0.09 sec, +0.04 sec, and DH.Y. at +0.05 sec.

In Table 3 above, there is a clear, significant increase in psychomotor data, which is evident across all indicators and team members, generally in a similar manner, but in some cases, with contrast. In the FFI indicator, there is a progressive increase in the correlation between strength, height, weight, and age, with values of +6.62% (or 5.96%). This indicator is particularly noticeable in A.B. with 17%, K.O. with 12%, and A.L. with 11%. This growth level has positively impacted other test indicators, especially in vertical jump height, and affected other test parameters.

In the "Jump height" indicator, the result reflects the vertical jump with both feet from the ground with the help of the arms, as a measure of explosive strength and coordination. The average indicator has increased by +4 cm (or 7.55%). The highest results were recorded by K.O. with 10 cm, M.G. with 7 cm, A.B. with 6 cm, and A.L. with 4 cm.

In the "Efficiency" indicator, it reflects the efficiency of the wrestler, his ability to perform physical, movement, and coordination actions with the required effectiveness. The values have increased, with the average indicator at +5.55% (or 6.13%). Notably, K.O. has increased by 16%, and K.G. by 12%, where this indicator shows a high movement capacity.

In Table 4 above, there is also a clear increase in psychomotor indicators across all team members, generally in a similar manner, but with contrasts in some cases:

- In the FFI indicator, there is a progressive increase in the correlation between strength, height, weight, and age, with values of +6.62% (or 5.96%). This indicator is particularly noticeable in A.B. with 17%, K.O. with 12%, and A.L. with 11%. This growth level has positively impacted other test indicators, especially in vertical jump height, and influenced other test parameters.
- In the "Jump height" indicator, it reflects the vertical jump with both feet from the ground with the help of the arms, as a measure of explosive strength and coordination. The average indicator increased by +4 cm (or 7.55%). The highest results were recorded by A.B. with 10 cm, M.G. with 7 cm, A.B. with 6 cm, and A.L. with 4 cm.
- In the "Efficiency" indicator, it reflects the wrestler's ability to produce physical, movement, and coordination actions with the required effectiveness. The values have increased, with the average indicator at +5.55% (or 6.13%). Notably, K.O. has increased by 16%, and K.G. by 12%, where this indicator demonstrates a high movement capacity.

Even though strength level is crucial for determining the fitness status of wrestlers, it can only discriminate lower-quality from high-quality wrestlers [14] while it does not efficiently differentiate advanced-level wrestlers. This has also been proven in numerous studies [14, 23].

5. Conclusions

Through the statistics and data presented, this study aims to assess the current state of our young wrestlers and outline where the focus should be for their future development.

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Firstly, the experimental training process tested both the theoretical and practical values of a new training methodology in the field of wrestling, characterized by specific and complex features that are achievable and essential for high performance. Through this methodology, the necessary conditions and opportunities were provided to achieve the relevant goals and objectives.

Secondly, the presented training methodology in this study is an original, standardized, applicable, and rational activity, free from unnecessary overloads that exhaust and tire the wrestler, making it more difficult to achieve specific and special indicators of fitness—essential for high results. This supports the first hypothesis of the study, where complex, dynamic, standardized, and overload-free training increases the physical, movement, and functional standards of the wrestlers.

Based on the above, we recommend avoiding exhausting and excessively long training sessions in wrestling, as well as the unnecessary use of exercises from other sports that are repeated mechanically, hindering the repetition processes and the progressive development of fitness indicators.

Thirdly, the training process in wrestling should be organized in line with the demands of the sport, where anaerobic energy processes dominate over aerobic ones (anaerobic alactic process at 10%, anaerobic lactic glycolytic process at 60%, and aerobic process at 30%).

In these conditions, the training process should prioritize loads with a distinct anaerobic physiological character, which place specific demands on special endurance indicators as a basic physical ability in preparing wrestlers for physical-movement activities with interruptions and intervals, where interval and alternative methods are applied.

This supports the second hypothesis of the study, where interval training with an emphasis on special endurance indicators and various physical-movement and functional elements accelerates fitness progress and has clear advantages over traditional training methods.

Therefore, we recommend that complex, cyclical training should take a primary role in the training process, being applied through circular methods with and without rest. The content of training units should emphasize special and specific elements, supplemented with exercises for strength, speed, coordination, etc.

Fourthly, the training activity should be based on the structure of "macro-cycles" that allow for the controlled distribution and application of training loads. In the annual cycle, 3-4 macro-cycles should be applied, with gradual achievements and progress toward the desired sporting form at the end of each cycle.

This confirms the third hypothesis of the study, where supporting the training process in macro-cycle structures is the most rational way to develop and control training loads, interacting with recovery, gradually preparing and adapting the wrestler toward the required fitness indicators and sports performance.

Based on the above, we recommend that the annual cycle should be built with macro-cycles, where each cycle has its own specific goals and objectives.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Copyright:

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