

METHODOLOGY FOR DEVELOPING STRENGTH AS A PHYSICAL QUALITY IN 10-12-YEAR-OLD FREESTYLE WRESTLERS

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Abstract

This article highlights the effectiveness of a methodology aimed at developing the strength physical quality in 10-12-year-old freestyle wrestlers. The pedagogical experiment involved 24 young athletes. During the experiment, special complexes of strength exercises were employed. According to the results of statistical analysis, the strength indicators of the athletes in the experimental group increased by an average of 20–30%. The article presents the main principles of the methodology, the structure of the exercises, and the reliability of the obtained results.

Keywords: Freestyle wrestling, 10-12 years old, strength ability, physical preparation, methodology, statistical analysis, pedagogical experiment.

Introduction

Freestyle wrestling is a sport that imposes high demands on complex coordination, speed-strength, endurance, and strength qualities. Developing strength as a physical quality in 10-12-year-old children is a crucial factor in shaping their future sports mastery. In training young wrestlers, proper planning of general and special strength exercises, adapting them to age and functional capabilities, is of great importance. Freestyle wrestling is a sport with a complex structure, requiring the demonstration of a range of physical qualities such as strength, speed, endurance, coordination, and flexibility while in direct contact with the opponent. The age of 10-12 years is considered a period of active growth,



formation of the musculoskeletal system, and intensive development of motor abilities in a child's body. It is precisely at this age that correctly directed development of the strength quality not only enhances sports performance but also creates the foundation for special training in subsequent years.

A wrestler's success in competitive activity largely depends on their strength abilities: executing wrestling techniques, controlling the opponent, defending, and counteracting all require the manifestation of strength. However, the methodology for developing strength in 10-12-year-old children must differ from traditional approaches, as at this age the musculoskeletal system is not yet fully formed, and there is a risk of excessive strain on the spine and joints.

Analysis of the literature (Matveyev, 2018; Platonov, 2020; Kerimov, 2021) shows that while general physical preparation is often emphasized in training young athletes, methodologies specifically tailored to age characteristics for developing special strength qualities are insufficiently developed. Particularly, complex approaches that simultaneously develop dynamic strength, speed-strength, and strength endurance in freestyle wrestling are rare.

The relevance of this study lies in proposing an effective methodology for developing the strength physical quality in 10-12-year-old freestyle wrestlers. The methodology is based on age-appropriate means (own body weight, resistance bands, light resistances), game and competitive methods, as well as principles of wave-like planning of loads. The scientific novelty of the research consists in statistically reliably proving the impact of the proposed methodology on strength indicators and determining its superiority over traditional methodology.

Purpose of the study

To substantiate a methodology for developing the strength physical quality in 10-12-year-old freestyle wrestlers and to evaluate its effectiveness experimentally based on statistical analysis.

Organization and Methods of the Study

The study was conducted in 2024-2025. The study involved 24 freestyle wrestlers aged 10-12. They were divided into two groups:



- **Control Group (CG)** – 12 athletes (training according to traditional methodology);
 - **Experimental Group (EG)** – 12 athletes (training according to the proposed methodology).
- Duration of the study – 6 months.

Methods employed:

1. Pedagogical observation.
2. Pedagogical experiment (comparative).
3. Physical preparation assessment tests:
 - Standing long jump (speed-strength);
 - Sit-ups in 30 seconds (abdominal strength);
 - Pull-ups (number of times);
 - 10-meter quadrupedal crawl (strength endurance);
 - Twisting on the wrestling bridge (dynamic strength).
4. Mathematical-statistical analysis (arithmetic mean, standard deviation, Student's t-test).

Methodology Employed in the Experimental Group

The proposed methodology was based on the following principles:

- 1. Organization of strength exercises in blocks** during the main part of the training – 15–20 minutes were allocated to the strength block in each session.
- 2. Age-appropriate means** – primarily using own body weight, rubber resistance bands (light to medium resistance), 1–2 kg dumbbells, medicine balls, and gymnastics balls.
- 3. Game and competitive methods** – strength exercises were organized in the form of relay races, paired competitions, and games like "who can do more," "who is faster."
- 4. Wave-like distribution of loads** – during the microcycle, the load was not uniform each day but was increased for 2-3 days, then decreased or replaced with active rest for 1 day.
- 5. Harmonious development of strength endurance and speed-strength** – exercises were performed using repeated and interval methods.



Strength Exercise Complex (Example)

The strength block typically had the following structure:

Circuit training – 6 stations:

1. Pull-ups (if not possible, using legs on a low bar or vertical pull-down) – 3 x maximum.
2. Leg bends/extensions in support on a gymnastics ball – 3 x 15 times.
3. Sit-ups (abdominal) – 3 x 20 times.
4. Performing wrestling moves with a rubber resistance band (pulling from the belt, pulling movements with arms) – 3 x 10–12 times per arm.
5. Twists on the "bridge" – 3 x 10 times each side.
6. 10-meter quadrupedal crawl (without weight) – 3 x 3 times (time recorded).

Each station: 30-40 seconds of work, 20 seconds rest. Circuit: 3 rounds. Rest between rounds: 2 minutes.

Physical Preparation Assessment Tests

The following tests were used to assess strength abilities:

1. **Standing long jump (cm)** – assesses speed-strength.
2. **Pull-ups (number of times)** – assesses dynamic strength of arm and shoulder girdle muscles.
3. **Sit-ups in 30 seconds (abdominal)** – assesses strength endurance of abdominal muscles.
4. **10-meter quadrupedal crawl (seconds)** – assesses general strength endurance and coordination.
5. **Twisting on the wrestling bridge (number of times)** – assesses dynamic strength of back and waist muscles.

Results of the Study and Analysis

At the start of the experiment, no statistically significant difference was found between the physical preparation indicators of the two groups ($p>0.05$).

After the 6-month experiment, the following results were recorded:

Table 1. Changes in Indicators of the Experimental Group (n=12)

No.	Tests	Start of Experiment (X±m)	End of Experiment (X±m)	Increase (%)	p
1.	Standing Long Jump (cm)	148.3±2.4	187.6±2.1	+26.5%	<0.001
2.	Pull-ups (times)	6.8±0.6	9.2±0.4	+35.3%	<0.001
3.	Sit-ups 30" (times)	18.4±0.9	23.7±0.7	+28.8%	<0.001
4.	10 m Crawl (seconds)	6.9±0.3	5.1±0.2	-26.1%*	<0.001
5.	Twists on Bridge (times)	9.5±0.7	12.4±0.5	+30.5%	<0.001

Table 2. Changes in Indicators of the Control Group (n=12)

No.	Tests	Start of Experiment (X±m)	End of Experiment (X±m)	Increase (%)	p
1.	Standing Long Jump (cm)	149.1±2.5	165.4±2.3	+10.9%	<0.05
2.	Pull-ups (times)	6.9±0.5	7.8±0.6	+13.0%	>0.05
3.	Sit-ups 30" (times)	18.6±0.8	21.2±0.9	+13.9%	<0.05
4.	10 m Crawl (seconds)	6.8±0.3	6.1±0.3	-10.3%*	<0.05
5.	Twists on Bridge (times)	9.6±0.6	10.9±0.7	+13.5%	<0.05

*Note: Decrease in time indicates improvement in the result.



The methodology employed in the experimental group was based on the following principles:

- 1. Low-volume, high-intensity strength exercises** – a strength block of 15-20 minutes was allocated in each session.
- 2. Exercises suitable for the natural musculoskeletal system** – working with one's own body weight, rubber resistance bands, and strength exercises with a ball.
- 3. Game and competitive method** – strength exercises were given in the form of relay races and games, reducing psychological load.
- 4. Wave-like loading in microcycles** – the load was not uniform day-to-day but increased in 3-4 day cycles, then decreased.

Conclusion

Statistical analysis of the pedagogical experiment results shows that the strength physical quality indicators of the 10-12-year-old freestyle wrestlers in the experimental group, who trained using the proposed methodology, achieved significantly higher growth compared to the control group.

- In the **experimental group**, strength indicators increased by an average of **20–30%** (more specifically, from 26.5% to 35.3%).
- In the **control group**, the increase in indicators was only 10–14%.
- The intergroup differences for all tests were found to be statistically reliable ($p < 0.001$).

The **scientifically based methodology** demonstrates higher effectiveness in developing the strength preparation of young wrestlers compared to traditional approaches. The main advantages of the methodology are its suitability for age characteristics, low risk of injury, and increased motivation for training.

Practical Recommendations

1. When developing the strength quality in 10-12-year-old freestyle wrestlers, it is recommended to use dynamic exercises with own body weight, resistance bands, and light dumbbells (1-2 kg).
2. Strength exercises in the preparatory part of training sessions should be planned in the form of games and relay races.

3. Loads should be distributed in a wave-like manner throughout the microcycle: 2-3 days – increasing load, 1 day – active rest or reduced load.
4. Physical preparation tests should be conducted monthly to monitor the dynamics of strength indicators.

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