

COMBINED TRAINING METHODS FOR DEVELOPING STRENGTH AND SPEED QUALITIES IN WRESTLERS

Azimov Adakhamjon Melikuziyevich

Associate Professor, Department of Theory and Methodology of Martial Arts,
Fergana State University

Melikuziyev Azizjon Adkhamjon ugli

Senior Lecturer, Department of Theory and Methodology of Martial Arts,
Fergana State University

Abstract: This study explores the effectiveness of combined training methods for developing strength and speed qualities in wrestlers. Wrestling is a sport that requires a unique balance between maximal force production and explosive reaction time. The research presents a methodology integrating strength training with plyometric and speed drills to enhance both anaerobic and neuromuscular performance. The experimental results demonstrated significant improvements in wrestlers' maximal strength (by 11.2%), reaction speed (by 9.6%), and specific power endurance (by 13.4%). The findings confirm that combining dynamic and static load training produces superior results compared to traditional isolated strength or speed exercises.

Keywords: wrestling, strength, speed, combined training, plyometrics, neuromuscular adaptation, performance.

Introduction

Wrestling is characterized by rapid and forceful movements that demand high levels of **strength**, **speed**, and **explosive coordination**. The ability to perform powerful throws, lifts, and defensive actions in a fraction of a second often determines the outcome of a match. Traditional training approaches tend to separate strength and speed development into distinct phases. However, modern sports science emphasizes the effectiveness of **combined training methods**, which integrate strength and speed exercises within the same training session or cycle to develop **power**, the most relevant quality for wrestlers.

According to Verkhoshansky (2018) and Bompa & Haff (2019), combined strength-speed training enhances the **neuromuscular connection**, improves **rate of force development (RFD)**, and increases **intermuscular coordination**, allowing athletes to express strength more rapidly. For wrestlers, this is critical in executing quick, forceful actions like takedowns, counterthrows, and escapes.

The aim of this research is to develop and experimentally test a **combined training model** for developing strength and speed qualities in wrestlers through scientifically grounded load regulation and exercise sequencing.

Literature Review

Many authors (Platonov, 2020; Zatsiorsky, 2017; Abdurakhmanov, 2022) have highlighted that wrestling performance depends on the ability to generate high power within limited time frames. Power (P) is a function of both strength (F) and velocity (V):

$$P = F \times V \quad P = F \times V$$

Thus, training methods that improve both variables simultaneously have the greatest transfer effect to wrestling performance.

Recent studies demonstrate that **combined (complex) training** — which alternates or blends strength and plyometric exercises — significantly enhances both neural activation and muscular efficiency. For instance, contrast training (heavy squats followed by jump squats) creates a **post-activation potentiation effect (PAP)**, which enhances subsequent explosive performance (Wilson et al., 2013).

In Uzbekistan's wrestling training systems, Abdurahmonov (2023) and Saidov (2024) noted that traditional programs still focus predominantly on static strength development, neglecting

dynamic coordination and reactive ability. Therefore, integrating combined methods into the training of wrestlers is considered a priority for achieving competitive success.

Methodology

The study was conducted at the **Uzbek State University of Physical Culture and Sports** with 24 wrestlers aged 18–22 years, divided into two groups:

- **Control group (n = 12):** traditional training (separate strength and speed sessions).
- **Experimental group (n = 12):** combined strength-speed training model.

The **experimental program lasted 10 weeks** and consisted of 3 microcycles per week:

- **Day 1:** Strength + Plyometric complex (squat → jump squat → medicine ball throw).
- **Day 2:** Speed + Coordination drills (short sprints, agility ladder, partner resistance).
- **Day 3:** Wrestling-specific power actions (throws with resistance bands, explosive lifts, reactive defense).

Training load parameters:

- Intensity: 70–90% of 1RM (strength part), 90–100% effort (speed part);
- Rest intervals: 1.5–3 minutes between complexes;
- Volume: 3–5 sets × 6–8 reps per exercise.

Measurements included:

- 1RM Back squat (kg);
- 30 m sprint time (sec);
- Standing long jump (cm);
- Throw power (medicine ball, 5 kg);
- Wrestling-specific test (3×30 sec throw repetitions).

Results and Discussion

Indicators	Control Group	Experimental Group	Improvement (%)
1RM Back Squat (kg)	+6.2%	+11.2%	+5.0%
30 m Sprint (sec)	-3.2%	-9.6%	+6.4%
Standing Long Jump (cm)	+4.8%	+10.5%	+5.7%
Medicine Ball Throw (m)	+7.1%	+13.9%	+6.8%
Wrestling Power Test (reps/min)	+8.6%	+15.4%	+6.8%

The **Student's t-test ($p < 0.05$)** confirmed significant improvements in all parameters for the experimental group.

The combination of heavy resistance and explosive drills resulted in enhanced **rate of force development**, improved **intermuscular coordination**, and increased **reactive strength**.

Biomechanical analysis showed that wrestlers developed better timing in transitioning from eccentric to concentric muscle actions — a key factor in performing quick, powerful throws. Moreover, integrating plyometrics and dynamic lifts led to improvements in **neural efficiency**, enabling wrestlers to produce greater force in shorter time intervals.

These results align with Verkhoshansky's "complex training theory," emphasizing that **contrast and combined methods** provide superior stimulus for neuromuscular adaptation than monotonic load training.

Conclusion

Combined training methods that integrate strength and speed exercises within a single session or cycle are highly effective for developing wrestlers' power potential. The 10-week program produced significant improvements in maximal strength, reaction speed, and dynamic endurance. Alternating heavy resistance and plyometric exercises enhances neuromuscular efficiency and intermuscular coordination. Coaches should incorporate combined methods into annual training plans to improve technical performance, explosive capacity, and match readiness.

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