Methodology for planning special developmental exercises in the training of skilled youth weightlifters

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Abstract
This article discusses improving special physical preparation indicators for skilled youth weightlifters. To effectively utilize attempts in competition and lift sufficient weight to secure victory, an athlete must demonstrate a stable level of special physical fitness. This requires enhancing the body's resilience and stability against high-intensity training loads. Therefore, high demands are placed on developing all muscle groups—not just individual muscles, but both large and small muscle groups—which leads to improved special physical preparation indicators.
Keywords: large and small body muscles, a group of special auxiliary and developmental exercises for competitive lifts, special physical preparation indicators, special physical qualities.

Introduction

Today, one of the most pressing issues is enabling young weightlifters to lift heavy weights in competition by enhancing their physical capabilities and technical skills, while also maintaining and improving a high-level of athletic form without adverse health effects from the training loads of the elite sports mastery stage during their transition to the adult age category. All scientific research conducted to date (V.S. Avanesov, A.V. Pakov, I.P. Sivokhin, V.G. Oleshko, L.S. Dvorkin, A.N. Vorobyov, R.M. Matkarimov, E.I. Kadyrov, K.F. Bayazitov, M.U. Arzikulov, A.Z. Khodjaev) shows that experimental work with weightlifters has focused on special physical preparation, optimal planning of training loads, and improving the technique of competitive exercises. We also observed that at various stages of preparation, the ratio of General Physical Training (GPT) and Special Physical Training (SPT), as well as special auxiliary and developmental exercises, is expressed only in general terms.

Furthermore, based on practical observation of coaches and the training process, it is evident that when creating training plans, coaches limit themselves to programs aimed at reinforcing the technique of competitive exercises and developing the strength of the major, more prominent muscle groups.

Methods

The study was conducted from January to February 2025 at the training facilities of the Uzbekistan National Weightlifting Team in Chirchiq, Uzbekistan. A pedagogical experiment was organized to evaluate the effectiveness of a combined methodology based on the targeted development of large and small muscle groups involved in the snatch and clean and jerk exercises.

A total of 14 qualified young weightlifters participated in the study. All athletes were regularly involved in national-level training camps and had previous competitive experience in Olympic weightlifting. The participants trained according to a six-session weekly microcycle throughout the two-month experimental period.

The research employed the following methods:

1.Analysis of scientific and methodological literature on weightlifting training methodology, special physical preparation, and planning of training loads;

2.Pedagogical observation of the training process;

3.Pedagogical experiment;

4.Control testing and control competitions;

5.Methods of mathematical and statistical analysis.

The experimental training program was designed according to the classification of large and small muscle groups directly involved in the execution of the snatch and clean and jerk. Special developmental exercises were selected based on their biomechanical similarity to competition lifts and their effectiveness in strength-

ening specific muscle groups responsible for technical execution and force production.

For the development of large muscle groups, exercises such as back and front squats, snatch pulls, clean pulls, power snatches, power cleans, jerks from racks, split jerks, push presses, and thrusters were included. For the development of small muscle groups, auxiliary exercises including Bulgarian split squats, calf raises, hyperextensions, core complexes, rotator cuff exercises, weighted push-ups, resistance-band exercises, and other corrective-strength exercises were applied.

Training loads were prescribed using percentage-based intensity zones relative to the athlete's maximum result in the snatch or clean and jerk, as well as body-weight-based resistance. The volume of each exercise was determined according to the number of sets, repetitions, duration of static work, and weekly frequency of application. At the end of the experimental period, control exercises and competition lifts were assessed to determine changes in special physical preparedness. The effectiveness of the proposed methodology was evaluated by comparing the athletes' performance indicators before and after the intervention period. The study complied with the ethical principles of sports science research, and all athletes voluntarily participated in the experiment.

Purpose of the study. To substantiate the methodology for using special auxiliary exercises in the training of qualified young weightlifters.

Research objectives:

- To study scientific and practical recommendations on planning training means and loads for qualified young weightlifters;
- To identify a group of special auxiliary and developmental exercises based on the specifics of teaching competitive exercise techniques;
- To introduce a combined training program aimed at developing the body's large and small muscles, taking into account the increased proportion of classical exercises during the pre-competition preparation period.

Results and discussion

Analysis of the training plans of countries achieving high results in weightlifting, combined with observation and analysis of the training processes of the Uzbekistan national team in collaboration with national and regional coaches, has led to the conclusion that today, high performance is achieved by structuring training around combined methods. These methods focus on improving special physical preparation by developing the athlete's large and small muscle groups and enhancing physical endurance to master the weight, in addition to perfecting technical skill.

The methodologies used to determine the prominent muscle strength of weightlifters during training are sufficiently precise and reliable.

However, despite the very high correlation between the development level of large and small muscle groups and athletic results, insufficient attention is being paid to training methodologies aimed at developing and strengthening these muscle groups, which are crucial for ensuring the reliable execution of the main competitive lifts.

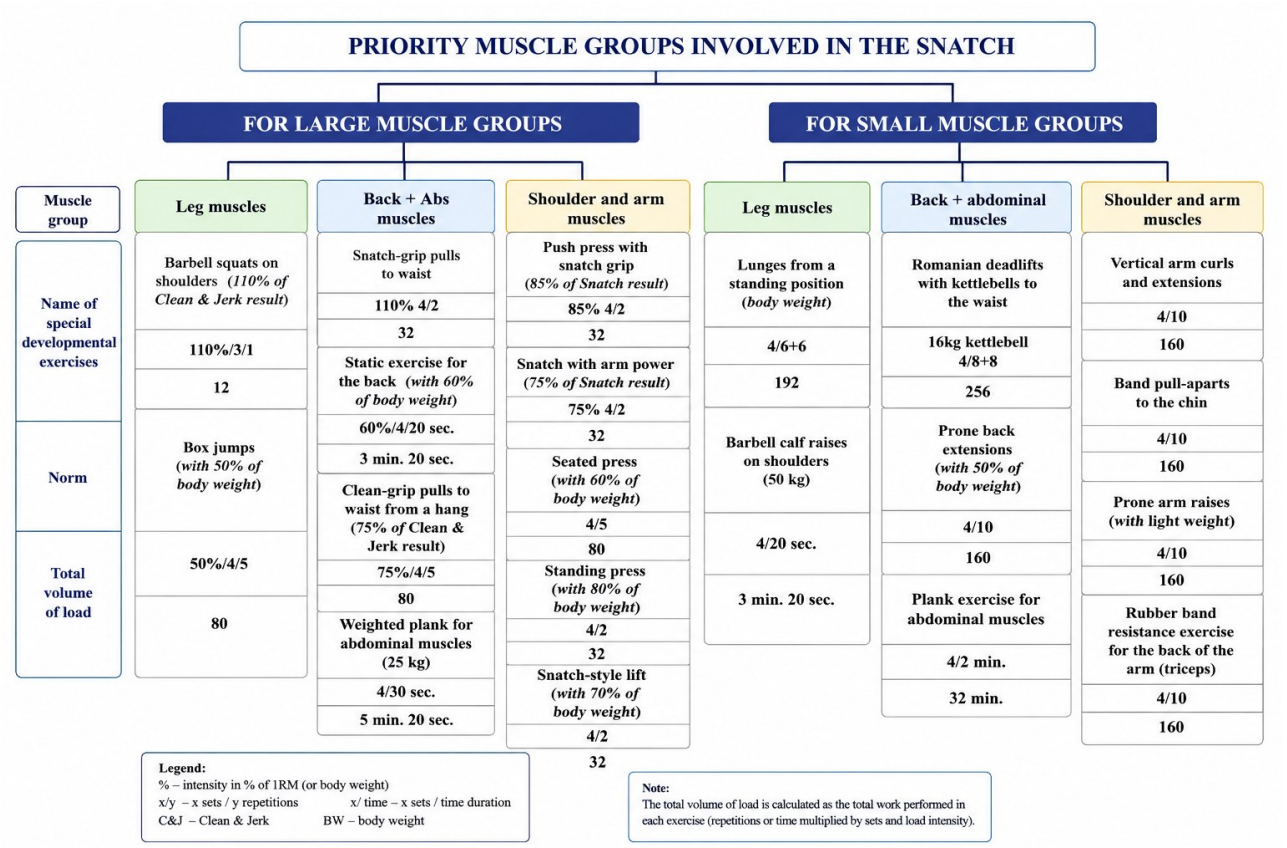
Given the specific requirements for improving the snatch and clean and jerk, it is a pressing issue to identify a group of special auxiliary and developmental exercises to strengthen the body's endurance for heavy loads by developing its large and small muscles, as well as to introduce a methodology for their rational use in training.

Starting in January 2025, a two-month pedagogical experiment was organized to achieve the research objective. The experimental work was conducted with a group of qualified young weightlifters participating in the training camps of the national weightlifting team, located on Sportchilar Street in the city of Chirchiq. The training sessions involved athletes at various levels of preparation. At the end of the two-month experimental phase, control competitions and control exercises were conducted to assess changes in the athletes' physical fitness. Six training sessions were scheduled per weekly cycle.

For the special pedagogical experiment, weightlifters of various ages were selected, and 14 athletes were included in the experimental group.

During the research process, training loads were planned using special developmental exercises. These exercises were aimed at developing the muscles required for performing the snatch, the clean and jerk, and auxiliary exercises, in order to eliminate common errors in performing the classic lifts and to master the exercise techniques flawlessly. We developed a combined training program aimed at developing the body's large

Fig 1. Training program for qualified young weightlifters during the preparatory period, structured according to the classification of the body's specific large and small muscles (Part-1)



and small muscle groups, taking into account the recovery state. (See Table 1).

Based on the combined exercise program implemented by us during the preparatory training period:

The large muscle groups of the body involved in performing the snatch exercise:

To develop leg muscles: The back squat with a barbell was performed once a week for 3 attempts of 1 repetition at a weight of 110% of the maximum snatch result.

Weighted jump exercise *(at 50% of personal body weight)* was performed once a week for 4 sets of 5 repetitions.

To develop back and abdominal muscles: The snatch-grip deadlift to the waist was performed once a week for 4 sets of 2 repetitions at a weight of 110% of the maximum clean & jerk result;

A static exercise for the back *(at 60% of personal body weight)* was performed for 4 sets of 20-second holds;

Snatch pull from a hang *(weight at 75% of the snatch result)* was performed once a week for 4 sets of 5 repetitions;

Plank exercise for the abdominal muscles *(with a 25 kg weight)* was performed twice a week for 4 sets of 30-second holds.

To develop shoulder and arm muscles: The snatch-grip push press *(at a weight of 85% of the maximum clean & jerk result)* was performed once a week for 4 sets of 2 repetitions;

Power snatch *(at 75% of the maximum clean & jerk result)* was performed once a week for 4 sets of 2 repetitions;

Seated press *(at 60% of personal body weight)* was performed once a week for 4 sets of 5 repetitions;

Standing press *(at 80% of personal body weight)* performed once a week, 4 sets of 2 reps;

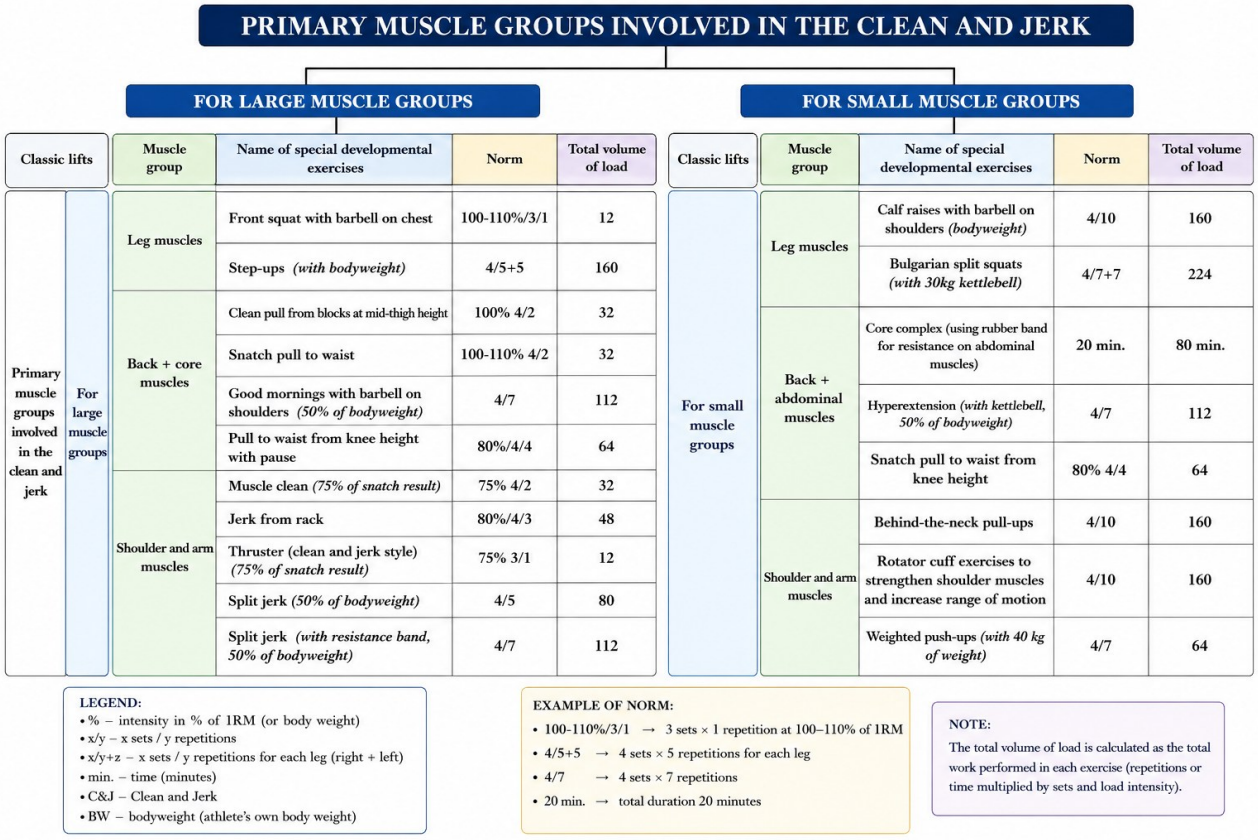
Snatch lift *(at 70% of personal body weight)* performed once a week, 4 sets of 2 reps.

Small muscle groups of the body involved in performing the snatch lift exercise:

To develop leg muscles: Standing lunge *(with body weight)* performed once a week, 4 sets of 4 reps for each leg;

Calf raises with a barbell on the shoulders *(with 50 kg weight)* performed once a week, 4 sets of 20 seconds.

Fig 1. Training program for qualified young weightlifters during the preparatory period, structured according to the classification of the body's specific large and small muscles (Part-2)



PRIMARY MUSCLE GROUPS INVOLVED IN THE CLEAN AND JERK

FOR LARGE MUSCLE GROUPS

Classic lifts		Muscle group	Name of special developmental exercises	Norm	Total volume of load
Primary muscle groups involved in the clean and jerk	For large muscle groups	Leg muscles	Front squat with barbell on chest	100-110%/3/1	12
			Step-ups *(with bodyweight)*	4/5+5	160
		Back + core muscles	Clean pull from blocks at mid-thigh height	100% 4/2	32
			Snatch pull to waist	100-110% 4/2	32
			Good mornings with barbell on shoulders *(50% of bodyweight)*	4/7	112
			Pull to waist from knee height with pause	80%/4/4	64
		Shoulder and arm muscles	Muscle clean *(75% of snatch result)*	75% 4/2	32
			Jerk from rack	80%/4/3	48
			Thruster (clean and jerk style) *(75% of snatch result)*	75% 3/1	12
			Split jerk *(50% of bodyweight)*	4/5	80
			Split jerk *(with resistance band, 50% of bodyweight)*	4/7	112

FOR SMALL MUSCLE GROUPS

Classic lifts	Muscle group	Name of special developmental exercises	Norm	Total volume of load
For small muscle groups	Leg muscles	Calf raises with barbell on shoulders *(bodyweight)*	4/10	160
		Bulgarian split squats *(with 30kg kettlebell)*	4/7+7	224
	Back + abdominal muscles	Core complex (using rubber band for resistance on abdominal muscles)	20 min.	80 min.
		Hyperextension *(with kettlebell, 50% of bodyweight)*	4/7	112
		Snatch pull to waist from knee height	80% 4/4	64
	Shoulder and arm muscles	Behind-the-neck pull-ups	4/10	160
		Rotator cuff exercises to strengthen shoulder muscles and increase range of motion	4/10	160
		Weighted push-ups *(with 40 kg of weight)*	4/7	64

LEGEND:
- % – intensity in % of 1RM (or body weight)
- x/y – x sets / y repetitions
- x/y+z – x sets / y repetitions for each leg (right + left)
- min. – time (minutes)
- C&J – Clean and Jerk
- BW – bodyweight (athlete's own body weight)

EXAMPLE OF NORM:
- 100-110%/3/1 → 3 sets × 1 repetition at 100–110% of 1RM
- 4/5+5 → 4 sets × 5 repetitions for each leg
- 4/7 → 4 sets × 7 repetitions
- 20 min. → total duration 20 minutes

NOTE:
The total volume of load is calculated as the total work performed in each exercise (repetitions or time multiplied by sets and load intensity).

To develop back and abdominal muscles: Romanian deadlifts with 16 kg kettlebells, pulling up to the waist, performed once a week, 4 sets of 8 reps;

Incline prone row *(at 50% of personal body weight)* performed once a week, 4 sets of 10 reps;

Plank exercise for abdominal muscles performed twice a week, 4 sets of 2 minutes each.

To develop shoulder and arm muscles: Vertical push-ups (handstand push-ups) performed once a week, 4 sets of 10 reps;

Pulling a special resistance band to the chin performed once a week, 4 sets of 10 reps;

Moving the arms straight out while in a prone position (Y-raises) *(with light weight)* performed once a week, 4 sets of 10 reps;

Exercise with resistance band for the back of the arm *(triceps)* muscle performed once a week, 4 sets of 10 reps.

Large muscle groups of the body involved in performing the clean and jerk exercise:

To develop leg muscles: Front Squats *(with 100-110% of 1RM)* performed once a week, 3 sets of 1 rep; Step-ups *(with body weight)* performed once a week, 4 sets of 5 reps on each leg.

To develop back and abdominal muscles: Clean Pull *(with 100% of 1RM)* performed once a week, 4 sets of 2 reps;

Snatch Pull *(with 100-110% of 1RM)* performed once a week, 4 sets of 2 reps;

Good Mornings *(with 50% of body weight)* performed once a week, 4 sets of 7 reps;

Pulls from knee level with resistance bands *(with 80% of 1RM)* performed once a week, 4 sets of 4 reps.

To develop shoulder and arm muscles: Power Clean *(with 75% of snatch max)* performed once a week, 4 sets of 2 reps;

Snatch *(with 80% of 1RM)* performed once a week, 3 sets of 4 reps;

Thrusters *(with 75% of snatch max) (with 80% of 1RM)* performed once a week, 3 sets of 1 rep;

Split Jerk *(at 50% of body weight)* performed once a week, 4 sets of 5 reps;

Split Jerk *(with a resistance band, at 50% of body weight)* performed once a week, 4 sets of 7 reps.

Small muscle groups of the body involved in the clean exercise:

To develop leg muscles: Standing Calf Raises with a barbell on the shoulders *(using body weight)* were performed once a week for 4 sets of 10 repetitions.

Bulgarian Split Squats *(with a 30 kg weight)* were performed once a week for 4 sets of 7 repetitions on each leg.

To develop back and abdominal muscles: a special Core complex *(using rubber band resistance for all abdominal muscles)* was performed for 20 minutes once a week.

Hyperextensions *(with a dumbbell equivalent to 50% of body weight)* were performed twice a week for 4 sets of 7 repetitions.

SK-style pulls from knee height to waist *(with 80% weight)* were performed once a week for 4 sets of 4 repetitions.

To develop shoulder and arm muscles: Behind-the-Neck Pull-ups on a pull-up bar were performed once a week for 4 sets of 10 repetitions.

To strengthen the shoulder muscles and increase the range of motion: *Rotator* cuff exercises with a rotational effect were performed once a week for 4 sets of 10 repetitions.

Push-ups *(with a 40 kg weight)* were performed once a week for 4 sets of 7 repetitions.

Based on a comparative analysis of the results of the conducted research and pedagogical experience, the following conclusions were drawn.

Conclusion

First, analysis of advanced experience and scientific-methodological literature, analysis of the training plans of countries achieving high results in weightlifting, as well as observation and analysis of the training processes of the national team of Uzbekistan, and analyses conducted in cooperation with national and regional team coaches, have proven that today, training sessions yield high effectiveness when they are structured using combined training methods. These methods are based on improving special physical preparation by developing the athlete's large and small muscle groups and increasing the body's endurance to overcome the weight, all in conjunction with enhancing technical skill.

Second, it has been proven that correctly planning the ratios for using special developmental exercises in a combined variant with classical exercises during the preparatory period increases an athlete's confidence in making effective use of their attempts in competition, taking into account the increased proportion of classical exercises in the pre-competition period.

Thirdly, it was determined that the priority areas are: identifying a mechanism for the phased selection of talented and promising qualified young weightlifters; rationalizing the variability of training load volume and intensity parameters to enable them to demonstrate their reserve capabilities and individual physical and technical preparation characteristics after an injury-free transition to the adult age category; and the targeted selection of training methods, taking into account age-specific characteristics and athletic achievements, to maintain the results they have achieved.

Fourthly, it was proven that planning the following percentage distribution of scientifically-based and selectively-oriented special developmental exercises in training leads to the highest efficiency: snatch from blocks and from the knee, 9.1%; snatch pull, 3.7%; snatch, 4.8%; snatch from a low platform (deficit snatch), 2.3%; clean, 3.5%; clean from blocks and from the knee, 6.4%; jerk, 4.9%; jerk from racks (from the chest and behind the neck), 7.6%; snatch-grip pull to the waist, 8.3%; back and front squats with a barbell, 9.3%; bench press, 6.9%; clean-grip pull to the waist, 6.1%; back and front squats with a barbell, 7.3%; standing press from the chest, 4.7%; and long and high jumps, 15.1%.

Fifth, it was determined that planning special developmental exercises in a combined sequence with classical exercises in weekly training sessions had a positive effect on strengthening the athlete's body's endurance and resilience to high-volume loads by developing the strength of the major and minor muscles of the legs, back, shoulders, and arms.

References

Dvorkin, L. S. (2017). *Tyazhelaya atletika: metodika podgotovki yunogo tyazheloatleta* [Weightlifting: Training methodology for the young weightlifter] (2nd ed.). Yurayt.

Dvorkin, L. S. (2017). *Tyazhelaya atletika* [Weightlifting] (Vol. 1, 2nd ed.). Yurayt.

Dvorkin, L. S. (2017). *Tyazhelaya atletika*

[Weightlifting] (Vol. 2, 2nd ed.). Yurayt.

Matkarimov, R. M. (2021). *Og‘ir atletikachilar ko‘p yillik tayyorgarlik tizimining ilmiy-nazariy asoslari* [Scientific and theoretical foundations of the long-term training system for weightlifters]. O‘zkitob Savdo Nashriyoti Matbaa Ijodiy Uyi.

Matkarimov, R. M. (2020). *Ommaviy razryadli og‘ir atletikachilar mashg‘ulot yuklamalari hajmi va shiddatining optimal nisbatlari samaradorligini aniqlash* [Determining the effectiveness of optimal ratios of volume and intensity of training loads for mass-category weightlifters]. *Fan-Sportga*, *(2)*, 34–38.

Toshturdiyev, Sh. X. (2020). *Velosipedchilarning kuch sifatini og‘ir atletika vositalari orqali rivojlantirish uslubiyati* [Methodology for developing cyclists’ strength qualities through weightlifting exercises]. *Fan-Sportga*, *(1)*, 39–45.

Toshturdiyev, Sh. X. (2022). *Yosh og‘ir atletikachilarning dast ko‘tarishga yordam beruvchi maxsus mashqlarini ilmiy-nazariy tavsiflari* [Scientific-theoretical descriptions of special exercises assisting young weightlifters in the snatch]. *Fan-Sportga*, *(2)*, 37–39.

Norqulov, Z. Ch. (2022). *Boshlang‘ich tayyorgarlik guruhidagi og‘ir atletikachilarning mashg‘ulot yuklamalarini rejalashtirish* [Planning training loads for weightlifters in the preliminary training group]. *Fan-Sportga*, *(5)*, 41–44.

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