Methodology for planning special developmental exercises in the training of qualified young weightlifters

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Abstract

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

Methods: Literature analysis, questionnaire survey, pedagogical observation, expert assessment, pulse measurement, pedagogical experiment, mathematical statistical methods.

Results: Hyperextension *(with a weight plate at 50% of personal body weight)* was performed 2 times per week, 7 repetitions in 4 sets;

Pulling from knee height to waist using the power clean technique *(with 80% weight)* was performed 1 time per week, 4 repetitions in 4 sets;

For the development of shoulder and arm muscles, behind-the-neck pull-ups were performed 1 time per week, 10 repetitions in 4 sets;

To strengthen shoulder muscles and increase range of motion, *rotator cuff* exercises were performed 1 time per week, 10 repetitions in 4 sets;

Push-ups on the floor *(with a 40 kg weight on the back)* were performed 1 time per week, 7 repetitions in 4 sets.

Conlcusion: The percentage of scientifically substantiated and selectively targeted special developmental exercises in the training: lifting from the support and knee 9.1%, lifting the barbell to the width of the snatch 3.7%, snatch 4.8%, lifting from a low position (stand) 2.3%, clean 3.5%, clean from the support and knee 6.4%, jerk 4.9%, jerk from behind the neck and from the chest 7.6%, pulling the barbell to the waist in the snatch grip 8.3%, squatting with the barbell on the shoulders and chest 9.3%, bench press 6.9%, pulling the barbell to the waist in the clean grip 6.1%, front and back squats with the barbell 7.3%, standing military press 4.7%, and long jump and high jump 15.1% was proven to lead to the highest efficiency.

Due to the planning of special developmental exercises in a combined order with classical exercises in weekly training sessions, a positive effect was revealed in strengthening the athlete's endurance and resilience under large volume loads by developing the strength of the large and small muscles of the legs, lower back, shoulders, and arms.

Keywords: large and small muscles of the body, a group of special auxiliary and developmental exercises for competitive exercises, indicators of special physical training, special physical qualities.

Introduction

Today, one of the urgent issues is maintaining and improving high-level sports performance of young weightlifters by increasing their physical capabilities and technical skills, conquering large weights in competitions, and transitioning to the adult age category without negative health impacts under the influence of training loads at the higher sports mastery stage. In all the scientific research works carried out to date (V.S. Avanesov, A.V. Pakov, I.P. Sivokhin, V.G. Oleshko, L.S. Dvorkin, A.N. Vorobev, R.M. Matkarimov, E.I. Qodirov, K.F. Bayazitov, M.U. Arzikulov, A.Z. Khodjayev) , it can be seen that weightlifters conducted experimental work aimed at special physical training, optimal planning of training loads, and improving the technique of competitive exercises in the preparation process. We also observed that at different stages of training, the ratio of general physical training and special physical training, as well as special auxiliary and developmental exercises, is expressed in a general form.

Furthermore, in practice, based on the observation of coaches and the training process, it is evident that coaches, when developing a training plan, are limiting themselves to programs aimed at reinforcing the technique of competitive exercises and developing the strength of clearly visible large muscles.

Analysis of training plans from countries achieving high results in weightlifting, as well as observation and analysis of the Uzbekistan national team's training processes, combined with collaborative analysis involving national team coaches and regional team coaches, has led us to conclude that forming training sessions through combined exercise methods yields high effectiveness. These methods focus on improving technical skills while developing large and small muscles of the athlete's body, and enhancing special physical preparation by developing the body's endurance to overcome weights.

The methods used to determine the strength of weightlifters' visibly prominent muscles during training are sufficiently accurate and reliable.

However, despite the very high correlation between the development of large and small muscle groups and sports results, insufficient attention is paid to training methods aimed at developing and strengthening these muscle groups, which are crucial for ensuring reliable performance of weightlifters' main competitive exercises.

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

Research objectives:

- Study scientific and practical recommendations for planning training methods and loads of qualified young weightlifters;
- Identify a group of special auxiliary and developmental exercises based on the specifics of teaching competitive exercise techniques;
- Incorporate a combined training program aimed at developing large and small muscles of the body into the training regimen, taking into account the increased proportion of classical exercises during the pre-competition preparation period;

Results and discussion

Starting from January 2025, a 2-month pedagogical experiment was organized to achieve the research goal. Experimental work was carried out with a group of qualified young weightlifters involved in the national weightlifting team's training camps, located on Athletes Street in Chirchik city, during training sessions of athletes with various levels of preparation. At the end of the 2-month experimental stage, control competitions and exercises were conducted to assess changes in the athletes' physical fitness. Six training sessions were planned in the weekly cycle.

Weightlifters of different ages were selected for the special pedagogical experiment, and 14 athletes were involved in the experimental group.

During the study, training loads were planned using special developmental exercises aimed at eliminating deficiencies in the performance of classical exercises and developing muscles that ensure the execution of snatch and clean and jerk, as well as auxiliary exercises for flawless mastery of exercise techniques.

Taking into account the recovery status, we developed a combined training program aimed at developing both large and small muscles of the body. (See Table 1).

Based on our combined exercise program implemented during the preparatory period:

Large muscle groups involved in performing the snatch:

For leg muscle development: Barbell back squats once a week. 3 sets of 1 repetition at 110% of snatch max.

Vertical jumps *(with 50% of body weight)* performed once a week, 4 sets of 5 repetitions.

To develop back and abdominal muscles: Clean-grip pulls to waist at 110% of clean max once a week, 4 sets of 2 repetitions;

Static exercise for the back *(with 60% of body weight)* performed for 20 seconds, 4 attempts;

Pulling the weight to the waist in a suspended position using the clean and jerk method *(weight at 75% of the clean and jerk result)* exercise once a week, 5 repetitions, 4 attempts;

Plank exercise for abdominal muscles *(with 25 kg weight)* twice a week, 30 seconds, 4 attempts.

To develop shoulder and arm muscles, push press exercise at snatch grip width *(weight at 85% of maximum snatch result)* performed once a week, 2 repetitions, 4 attempts;

Snatch with arm power *(at 75% of maximum snatch result)* exercise performed once a week, 2 repetitions, 4 attempts;

Seated press *(with 60% of body weight)* performed once a week, 5 repetitions, 4 attempts;

Standing press *(with 80% of body weight)* performed once a week, 2 repetitions, 4 attempts;

Snatch-grip high pull *(with 70% of body weight)* performed once a week, 2 repetitions, 4 attempts.

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

To develop leg muscles, stationary lunges *(with body weight)* performed once a week, 4 repetitions for each leg, 4 attempts;

Walking on tiptoes with a barbell on shoulders *(with 50 kg weight)* performed once a week, 20 seconds, 4 attempts.

To develop the muscles of the lower back and abdomen, pulling 16 kg weights to the waist using the Roman chair method was performed once a week, 1 time, with 4 sets of 8

Table Training program compiled according to the classification of special large and small muscles of the body for the preparation period of qualified young weightlifters

Classical exercises	Muscle group		Name of special developmental exercises	Norm	Total volume of loads
Priority muscle group involved in the snatch	For large muscle groups	Leg muscles	Overhead squat with a barbell on the shoulders *(at 110% of the snatch result)*	110%/3/1	12
			Vertical jump *(50% of body weight)*	50%/4/5	80
			Pull to waist at snatch width	110% 4/2	32
		Lower back + abdominal muscles	Static back exercise *(60% of body weight)*	60% 4/20 s.	3 min. 20 s.
			Pulling the weight to the waist in a hanging position using the clean grip *(at 75% of the clean result)*	75%/4/5	80
			Plank exercise for abdominal muscles *(25 kg)*	4/30 sec.	5 min. 20 s.
		Shoulder and arm muscles	Push press at snatch grip width *(at 85% of the snatch result)*	85% 4/2	32
			Hand-assisted lifting *(at 75% of the snatch result)*	75% 4/2	32
			Seated press *(60% of body weight)*	4/5	80
			Standing press *(80% of body weight)*	4/2	32
			Overhead lifting using snatch technique *(70% of body weight)*	4/2	32
	For small muscle groups	Leg muscles	Standing jump *(body weight)*	4/6+6	192
			Walking on tiptoes with barbell on shoulders *(50 kg)*	4/20 sec.	3 min. 20 s.
		Back + abdominal muscles	Romanian deadlift with weights up to the waist	16kg kettle-bell 4/8+8	256
			Prone position back extension *(50% of body weight)*	4/10	160
			Plank exercise for abdominal muscles	4/2 min.	32 min.
		Shoulder and arm muscles	Vertical push-ups	4/10	160
			Pull special resistance band to the chin	4/10	160
			Prone position arm extension *(with light weight)*	4/10	160
			Resistance band exercise for triceps	4/10	160
Priority muscle groups involved in the jerk	For large muscle groups	Leg muscles	Front squat with barbell	100-110%/3/1	12
			Step-ups - *(with body weight)*	4/5+5	160
		Lower back + abdominal muscles	Pulling from blocks to waist at snatch grip width	100% 4/2	32
			Pulling from blocks to waist at clean grip width	100-110% 4/2	32
			Standing good morning with barbell on shoulders *(50% of body weight)*	4/7	112
			Pulling from knee level to waist with shock absorption	80%/4/4	64
			Hand-assisted clean *(at 75% of the clean result)*	75% 4/2	32
		Shoulder and arm muscles	Power jerk from blocks	80%/4/3	48
			Power jerk *(at 75% of the clean result)*	75% 3/1	12
			Leg scissors lift *(50% of body weight)*	4/5	80
			Leg scissors lift *(with resistance band, 50% of body weight)*	4/7	112
	For small muscle groups	Leg muscles	Calf raises with barbell on shoulders *(body weight)*	4/10	160
			Bulgarian split squats *(30kg dumbbell)*	4/7+7	224
		Back + abdominal muscles	Core complex (using resistance band for abdominal muscles)	20 min.	80 min.
			Hyperextension (with weight *at 50% of body weight)*	4/7	112
			Pull-ups from knee to waist level using snatch grip	80% 4/4	64
			Behind-the-neck pull-ups	4/10	160
		Shoulder and arm muscles	Rotator cuff exercise to strengthen shoulder muscles and increase range of motion ***Rotator*** exercise	4/10	160
			Push-ups *(with 40 kg additional weight)*	4/7	64

repetitions for each leg;

Incline in a prone position *(with 50% of body weight)* was performed once a week, 1 time, with 4 sets of 10 repetitions;

Plank exercise for abdominal muscles was performed twice a week, 2 times, with 4 sets of 2 minutes each;

To develop shoulder and arm muscles,

push-ups in a vertical position were performed once a week, 1 time, with 4 sets of 10 repetitions;

Pulling a special rubber band to the chin was performed once a week, 1 time, with 4 sets of 10 repetitions;

Arm extensions in a prone position *(with light weights)* were performed once a week, 1 time, with 4 sets of 10 repetitions;

Exercise for the back of the arm *(triceps)* muscle using rubber resistance was performed once a week, 1 time, with 4 sets of 10 repetitions.

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

For leg muscle development, squats with a barbell on the chest *(with 100-110% of body weight)* were performed once a week, 1 time, with 3 sets of 1 repetition;

Step-ups - *(with body weight)* were performed once a week, 1 time, with 4 sets of 5 repetitions for each leg.

To develop lower back and abdominal muscles, pulling from the rack to the waist at shoulder width *(with 100% of body weight)* was performed once a week, 1 time, with 4 sets of 2 repetitions;

Pulling to the waist at hip width *(with 100 -110% of body weight)* was performed once a week, 1 time, with 4 sets of 2 repetitions;

Bending with a barbell on shoulders in a standing position *(at 50% of body weight)* once per week, 4 sets of 7 repetitions;

Pulling to the waist with cushioning from knee height *(with 80% of maximum weight)* once per week, 4 sets of 4 repetitions.

For shoulder and arm muscle development: Arm-assisted lift to chest *(at 75% of maximum clean and jerk result)* once per week, 4 sets of 2 repetitions;

Power snatch from blocks *(with 80% of maximum weight)* once per week, 3 sets of 4 repetitions;

Power clean *(at 75% of maximum* clean and jerk *result) (with 80% of maximum weight)* once per week, 3 sets of 1 repetition;

Lifting with legs in scissors position *(at 50% of body weight)* once per week, 4 sets of 5 repetitions;

Lifting with legs in scissors position *(using resistance bands, at 50% of body weight)* once per week, 4 sets of 7 repetitions.

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

For leg muscle development: Calf raises with barbell on shoulders *(using body weight)* once per week, 4 sets of 10 repetitions;

Bulgarian split squats (with *30kg weight)* once per week, 4 sets of 7 repetitions for each leg;

For back and abdominal muscle development: Special core strengthening complex *(using rubber resistance for all abdominal muscles)* once per week, performed for 20 minutes;

Conclusion

Based on a comparative analysis of the research results and pedagogical experiment, the following conclusions were drawn:

Firstly, the analysis of best practices and scientific-methodological literature, examination of training plans from countries achieving high results in weightlifting, as well as observation and analysis of the Uzbekistan national team's training processes, along with collaborative analysis with national team coaches and regional team coaches, have demonstrated that currently, structuring training sessions through combined exercise methods leads to high effectiveness. These methods focus on improving special physical preparation by developing both large and small muscles of the athlete's body and enhancing body endurance to master weightlifting, alongside improving technical skills.

Secondly, considering the increased proportion of classical exercises in the pre-competition period, it has been proven that correctly planning the ratios of special developmental exercises in combination with classical exercises during the preparatory period's training sessions increases confidence in the effective use of attempts during competitions.

Thirdly, determining the mechanism for phased selection of talented and promising young weightlifters, rationalizing the variability of training load volume and intensity parameters to demonstrate their reserve capabilities and individual physical and technical training characteristics after transitioning to the adult age category without injuries, and targeted selection of training methods considering age characteristics and sports achievements to maintain achieved

results were identified as priority areas.

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