Improving the technique of performing competitive exercises in the training process of weightlifters

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Abstract

Purpose: To enhance the athletic performance of weightlifters, achieve high results, and organize an effective training process by improving the techniques of competitive exercises (weightlifting, pressing, throwing, and others) during the training process.

Methods: Educational and Practical Methods: Step-by-step training of exercises (principle of progression from easy to difficult); Mastering technical actions in parts;
Use of video analysis and visual aids. Scientific and theoretical methods: Study of scientific literature, programs, and methodological manuals; Analysis of the experiences of scientists and coaches. Control and assessment methods: Identification and correction of errors that occur during the training process; Monitoring the load, movement trajectory, and results; Control of biomechanical and physiological indicators. Methods used in practice: Ensuring technique stability through training with different weights; Exercises for developing the harmony of speed, strength, and movement; Group and individual training methods.

Results: In relation to the total training loads in special auxiliary exercises during the preparation cycle, the distribution was as follows: 12.5% in the 1st intensity zone, 10.0% in the 2nd zone, 21.0% in the 3rd zone, 33.8% in the 4th zone, 15.0% in the 5th zone, and 7.6% in the 6th (highest) zone. In the pre-competition mesocycle, the distribution was 8.0%, 3.2%, 1.6%, 35.8%, 21.4%, and 29.9% respectively. As a result, the distribution of load volume by intensity closely approximated the normal distribution law (from a mathematical perspective).

Conlcusion: The experimental results indicate that using average weights (81-90%) in special auxiliary exercises across different intensity zones on a weekly basis has a positive effect on improving the technique of performing the snatch and clean and jerk, as well as increasing the snatch result.

Keywords: snatch, clean and jerk, squat, pull, technique, intensity, volume, number of barbell lifts.

Introduction

Numerous studies have shown that the rational use of special auxiliary exercises contributes to the improvement of a weightlifter's sports performance and technical skills, as well as the development of physical qualities.

In the preparation cycle, a total of 160 barbell lifts (BL) were distributed between competitive exercises and exercises from knee-height level. In the preparation cycle, for the snatch and clean and jerk exercises, 160 BL were planned for the first and second weeks, 144 BL for the third and fourth weeks, 136 BL for the fifth to eighth weeks, and 160 BL for the last four weeks. For competitive exercises in the preparation cycle, 80 BL were planned for the first and second weeks. In the third and fourth weeks, BL were reduced by 8 for each competitive exercise. From the fifth to eighth weeks, BL were further reduced by 4. In the ninth week, the load was returned to that of the first and second weeks.

The distribution of training loads in the training camp 4 weeks before the competition contradicts the recommendations of specialists *(K.F. Bayazitov, 2011; L.S. Dvorkin, 2018; R.M. Matkarimov, 2018; A.V. Pakov, 1985; V. OleBLo, 2007; R.A. Roman, 1986; V.I. Frolov, 1977; A.V. Chernyak, 1978 and others).* There is no variability in loads, and the monthly load volume has barely changed compared to the preparation cycle due to the transfer of the load from the knee-height snatch exercise to the competition snatch exercise. From the first to the fourth week of the pre-competition cycle, the load of the competition snatch exercise was distributed evenly, while the knee-level snatch exercise was completely removed from the training plan. The absence of standards for the rational distribution of training load volume in competition snatch exercises for qualified weightlifters may negatively affect the results of weightlifters' participation in competitions.

In physical training, squats and pull-ups, as well as jumping exercises, constitute the main volume of the training load, since their use leads to an increase in personal strength indicators, which are very important for sports improvement in weightlifting.

Results and discussion

The results in the snatch and clean and jerk depend on the results in barbell squats, therefore weightlifters pay more attention to

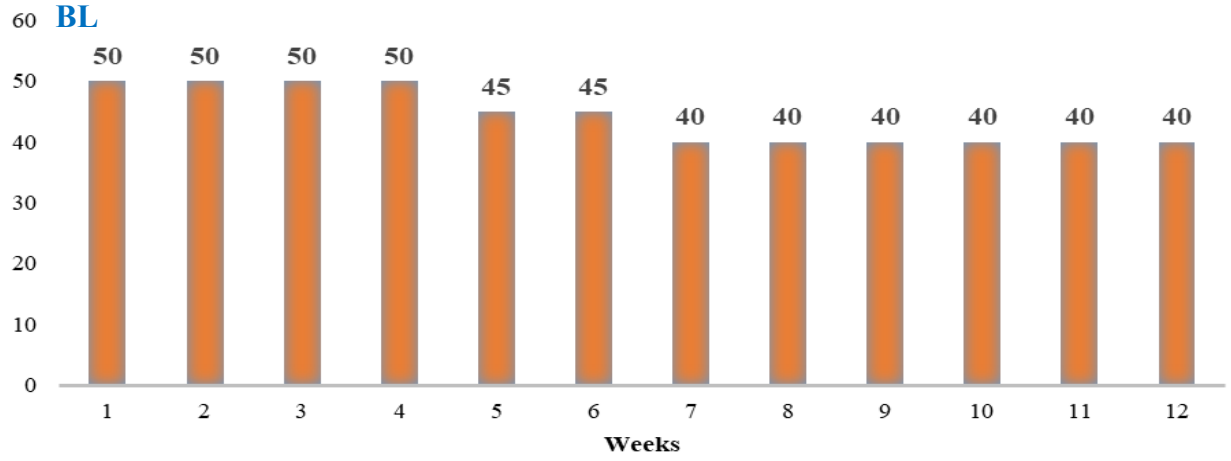
this particular exercise compared to all special auxiliary exercises.

In squats, the volume of the load occupies a leading place in the total volume of the training load, as this exercise allows for a maximum increase in the strength indicators of the leg and torso extensor (lower back) muscle groups. These muscle groups are considered the most important components in a weightlifter's body for bearing the main training load. This exercise also contributes to the formation and strengthening of the weightlifter's technique.

It is advisable to introduce snatch and clean and jerk pulls into training when the athlete reaches the first sports level. For lower-level athletes, strength is sufficiently developed through exercises such as half-squats in the snatch and half-squats in the clean, and therefore there is no need to include pulls in their training. However, for qualified weightlifters, using pulls to adapt to maximum weights and improve technique is effective.

Snatch pulls are used to improve the technique of lifting a barbell to a squatting

Figure 1 Dynamics of the load volume in squats for qualified weightlifters during the eight-week training cycle



In our study of the training process at the sports improvement stage, the average indicator of load volume in squats with a barbell on the shoulders was 370 barbell lifts during the training cycle, which amounted to 13.4% of the total volume of the main load. In the pre-competition mesocycle, the number of barbell lifts was 130.

Within the framework of the twelve-week preparatory cycle for squats From the 1st to the 12th week, the load volumes vary within the range of 5-20 barbell lifts. Squats are the main means of strength training for weightlifters, and correctly selected loads during squats ensure the growth of strength and sports-technical indicators. As noted, the lack of variability in the distribution of training load can lead to unfavorable adaptation.

The study of load volume in squats during twelve-week training cycles revealed a significant difference between cycle weeks according to Student's t-test for the compared samples. Consequently, qualified weightlifters consistently perform the same planned weekly load within the three-month training cycle.

position and to develop the weightlifter's strength abilities (particularly the extensor muscles of the body)

In snatch pull exercises, the minimum weight used in training is approximately 70% of the competition snatch result, while the maximum weight is 120%.

Different barbell weights affect the development of technique and strength differently. Improvement in snatch and clean and jerk technique can be achieved by performing pulls with weights of 91-100% and 101% and higher relative to the maximum result in the snatch.

Snatch pulls significantly influence the improvement of sports performance in competitive snatches, developing the strength capabilities of the extensor muscles and improving the technique of this exercise. The volume and intensity of the load in snatch pulls (see Table 1).

In the table, specifically, the numbers represent lifts with barbells weighing 61-70% of maximum. Athletes typically perform pulls three times a week, with one training session

Table 1 Distribution of training load volume (TL) in pulls and squats for qualified weightlifters in the experimental group

Parameters	WEEKS											
	Preparatory cycle								Pre-competition cycle			
	Weeks											
	1	2	3	4	5	6	7	8	9	10	11	12
Snatch pulls	48	48	48	48	48	48	48	48	40	40	40	40
Snatch	50	50	50	50	45	45	40	40	40	40	40	40
Snatch pulls + YE	98	98	98	98	93	93	88	88	80	80	80	80

featuring snatch pulls and another featuring clean pulls. Pulls are usually performed in the middle or at the end of the session, sometimes at the beginning (depending on the training objective). The volume of loads remains constant from week 1 to week 8 and from week 9 to week 12 in the twelve-week cycle. In the pre-competition cycle, 4 weeks before the competition, weightlifters gradually reduce the number of barbell lifts by 8 TL. As mentioned, specialists recommend careful distribution of loads during the pre-competition preparation stage.

In the last four weeks of competition preparation, the load volume for weightlifters is slightly reduced. However, it should be noted that overall, in the twelve-week cycle, the volume of training load is distributed across weeks in a sufficiently variable manner.

The study reflected the average values of absolute intensity during the twelve-week preparation period of qualified weightlifters for competitions.

The table shows that in the training plan of the experimental group, according to the total intensity zones of the load volume, the following were planned: 51-60% - 138 PVZ (3.9%), 61-70% - 156 PVZ (4.4%), 71-80% - 402 PVZ (11.4%), 81-90% - 486 PVZ (13.7%), 91-100% - 176 PVZ (5.0%), and in the intensity zone 101 and higher - 198 PVZ (5.6%).

In the training cycle, relative to the total training loads in special auxiliary exercises, the distribution was as follows: 1st intensity zone - 12.5%, 2nd zone - 10.0%, 3rd zone - 21.0%, 4th zone - 33.8%, 5th zone - 15.0%, and 6th upper zone - 7.6%. In the pre-competition mesocycle, it was distributed as 8.0%, 3.2%,

Figure 2. Dynamics of load volume in pulls during a twelve-week training cycle for qualified weightlifters

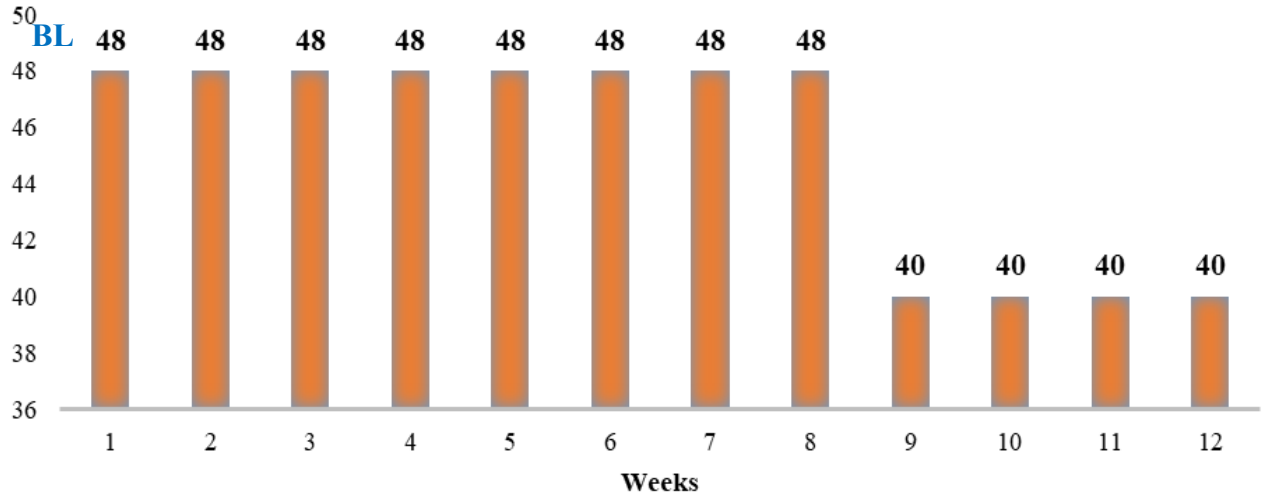


Table 2. Partial volume of training loads in special auxiliary exercises during the preparatory and pre-competition cycles by intensity zones (PVZ)

Intensity zones					
51-60%	61-70%	71-80%	81-90%	91-100%	101 and above
In the preparatory cycle					
180	144	304	472	216	110
Pre-competition cycle					
30	12	6	134	80	112

1.6%, 35.8%, 21.4%, and 29.9%, respectively. As a result, the intensity distribution of the load volume turned out to be close to the normal distribution law (from a mathematical perspective).

In the preparation cycle, the training load intensity of the snatch exercise from knee height level is planned to be performed 48 times in total each week from week 1 to week 4. In weeks 1 and 2, it is planned to perform 16 repetitions in zone 2 and 32 repetitions in zone 3, while in weeks 3 and 4, it is planned to be performed in zones 3 and 4. In weeks 5 and 6, it is planned to carry out 32 repetitions in zones 3 and 4 each week, and 28 repetitions in zones 3 and 4 in weeks 5 and 6. Due to the determination that preparation for competitive exercises would be conducted in the pre-competition cycle, the snatch exercise was removed from the training plan. Its load was transferred to the competitive snatch exercise.

The training load intensity of pull-ups in snatch and clean and jerk exercises is planned to be performed 48 times each week during the preparation cycle. Out of 48 repetitions, in weeks 1 and 4, it is planned to perform 16 repetitions in zones 3, 4, and 5, while in weeks 5-8, it is planned to be carried out in zones 4, 5, and 6. In the pre-competition cycle, 40 repetitions are planned for each week. Of these, 16 repetitions are planned in zone 4, 8 repetitions in zone 5, and 16 repetitions in zone 6.

The intensity of the training load for squats with a barbell on the shoulders in the preparatory cycle is planned as follows: for weeks 1-4, 50 BL (barbell squats) per week. In zones 2-3, 12 BL (squats) each, and in zone 4, 26 BL. For weeks 5-6, it was reduced to 5 times, and work in high-intensity zones was prescribed. In zone 4, 12 BL; in zone 5, 23 BL; and in zone 6, 10 BL. In weeks 7-8, BL was reduced to 5 times. Changes were made to the intensity zones. Thus, 6 BL were planned in zone 4, 22 BL in zone 5, and 12 BL in zone 6. In the pre-competition cycle, compared to the preparatory cycle, BL was reduced by 10 in weeks 1-2 and by 15 in weeks 3-4. This resulted in 40 BL in weeks 1-4. Loads were distributed by intensity zones as follows: in weeks 1-4, 16 BL were planned in zone 4, 8 BL in zone 5, and 16 BL in zone 6. As the competition day approaches, it is considered advisable to work in the intensity zone of 101% BL and higher.

Conclusion

During the experiment, the planned training loads were almost fully implemented. The training process revealed the advantage of the new distribution methodology used in planning the monthly cycle. The new planning methodology we applied allowed for quite effective construction of weekly cycles.

According to our research, the limit of the main training weights for qualified weightlifters ranges from 81% to 90%. Thus, in improving the snatch and clean and jerk techniques, the maximum training volume in special auxiliary exercises (SAE) was planned as follows: in pulls - 544±7.3 times, in high jumps - 540±9.3 times, in squats - 530±12.3 times, in snatches from knee height - 296±7.6 times SAE. For special auxiliary exercises, 188 SAE at 51-60% weight, 144 SAE at 61-70%, 304 SAE at 71-80%, 488 SAE at 81-90%, 216 SAE at 91-100%, and 110 SAE in the zone above 101% are planned. In the pre-competition mesocycle, 30 SAE, 12 SAE, 6 SAE, 134 SAE, 80 SAE, and 112 SAE were planned respectively. As a result, the intensity distribution of the load volume turned out to be close to the normal distribution law (from a mathematical point of view).

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