Original Article

A technique for fast physical training of qualified weightlifters at the training stage of preparation

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Abstract:

This article discusses the issue of improving the methodology of special physical training of qualified weightlifters from different weight categories at the training stage of preparation (4-5th year of study). The ratio of the training load during the annual training cycle is presented, and the influence of the developed methodology is determined on the basis of the obtained results on the preparation of weightlifters. **Research objective:** The objective of this research was to develop a method of special physical training for qualified weightlifters for the training stage. **Research methods and organization:** The research took place at the sports school of the Olympic reserve (ORSS) base of the Moscow weightlifting school. The study was conducted during the 2017–2018 school year. A total of 21 athletes participated in this study (14 athletes from the lightweight category and 7 from the heavyweight category), who were in their 4-5th year of training. **Research results and conclusions:** the obtained research results on the level of sports skill during the weightlifting training preparation phase in the snatch, jerk, and the total sum, which were determined using biased growth, indicate an average rate of 28%.

Keywords: training method; sports training; special physical training; training phase; weightlifting; qualified weightlifters

Introduction

The research on the level of sportsmanship (athletic preparedness) is essential for training and competitive activities in many sports because specialists constantly strive to improve the methods of special training of athletes based on the analysis and generalization of practical experience and specially organized scientific research [1;3;7;11;13;14;16;19;20;21;22].

The analysis of the scientific and methodological literature on the special physical training of weightlifters of various qualifications and ages characterizes various approaches and methods of training [3;4;6;8;15;17;18]. However, various principles, combinations, and variability of application of these methods are considered mainly in general terms and lack specific details [5;10]. Due to the increasing competition in sport, it is important to apply the most effective methods of physical training to training junior athletes and search for new approaches to improve this process [2;9;12;22].

This research is important for improving the special physical training of junior-age weightlifters because there is a lack of available scientific and methodological literature on this topic. In addition, this research can be used to optimize the training conditions at certain time periods and methodological features of the training process.

Research objective: to develop a method of special physical training for the qualified weightlifters at the training stage of preparation.

Research hypothesis: it is hypothesized that the developed technique of special physical training will improve the level of sportsmanship of weightlifters at the training stage of preparation.

Research objectives:

1. To determine the level of sportsmanship of qualified weightlifters in the snatch, jerk, and the sum of biathlon.
2. To develop a methodology for the special physical training with an optimal choice of exercises for training qualified weightlifters at the training stage of preparation.

3. To substantiate the effectiveness of the developed methodology for training qualified weightlifters at the training stage of preparation based on the dynamics of the results of preparedness.

Materials and methods

In this study, the following methods were used: analysis of scientific and methodological literature, pedagogical observation, analysis of the competition protocol, pedagogical experiment, mathematical and statistical processing of research results.

The research was conducted at the ORSS of the weightlifting school in Moscow from June 2017 to May 2018 and consisted of three stages. In this study, the participating athletes were in their 4-5th year of training. During the first stage of the research (June 2017–May 2018), the main pedagogical experiment was performed, and the effectiveness of the proposed methods of special physical training was evaluated. To carry out the research, a total of 21 athletes were divided into two groups (14 athletes in the lightweight category and 7 athletes in the heavyweight category). All athletes were engaged in the program and used the developed methodology. The second stage of the research (May–June 2018) consisted of processing and summarizing the research results. Classes were held 5 times a week (135 minutes per class) for 11 months. At the end of each research stage, classification competitions were held in biathlon.

According to the average statistical data, graphs were constructed, which reflected the dynamics of the level of sportsmanship for the year, and a comparative analysis was carried out using Student's t-test.

The main components of the training material consisted of the proposed training program for weightlifting. Training loads were developed according to the parameters of the generally accepted program of sports training in weightlifting and FSES. The developed methods contained the following sections including their percentage ratios: theoretical preparation –2.7%, general physical training –41.0%, and special physical training – 56.3%. This approach allows the coaches from any sports school to offer a single training program, which was developed using an integrated scientific approach, and to evaluate the long-term progress of weightlifters at the training stage of preparation.

The approximate values of the training load for weightlifters at the training stage of preparation were focused on training athletes 2-3 sports categories. The method of special physical training developed by us for the annual cycle of training contained the following parameters: number of training days – 210; number of training sessions (including on-site training) – 312; volume (number of bar raises) – 8862; number of bar lifts in the jerk and snatch exercises (weight 90–100%), taking into account a separate number of lifts to the chest and jolts from the chest – 297; relative intensity of jerk and snatch exercises – 73%.

Results

The chosen tools for the experimental training program contained the exercises of special physical preparation. The exercises were divided into the following categories: preparatory jerk and snatch exercises, special and auxiliary jerk and snatch exercises, additional and main exercises (56 exercises).

In addition to the basic (maximal and dynamic efforts) methods of developing effort for weightlifters, the methods of repeated effort were used.

Research results and discussion

The growth dynamics in the competitive exercise “Jerk” for the weightlifters from different weight categories during the experiment period is presented in **Figure 1**.

Legend: LWC - lightweight category; HWC - heavyweight category; ΣVK - sum of all weight categories.

Figure 1. Dynamic analysis of the level of sportsmanship of the tested weightlifters in the snatch barbell exercise

From June 2017 to May 2018, there was an increase in the level of sportsmanship from 120 to 145 points (a 25-point increase, 17%) in the lightweight category and from 99 to 166 (a 67-point increase, 40%) in the heavyweight category. Thus, in the heavyweight category, the skill increase for the snatch exercise was more significant. The average degree of increase in performance over the four-month period varied. The greatest increase was observed from June to October 2017 – 26 points; then it decreased by 7 points; and in February – May 2018, it increases again, but not as much – by 13 points.

The dynamics of the increase in the competitive exercise “Jerk” in weightlifters from different weight categories during the research period are presented in Figure

2.

Legend: LWC - lightweight category; HWC - heavy weight category; ΣVK - sum of all weight categories.

Figure 2. Dynamic analysis of the level of sportsmanship of the tested weightlifters in the barbell push exercise

Similar to the results of the jerk exercise, in the push exercise, the growth of the level of sportsmanship was progressive. In the lightweight category, the increase for the annual training cycle was 26 points (14%); in the heavyweight category, the increase was 78 points (39%). Thus, the increase in the heavyweight category for the training stage was more significant. If in the jerk exercise the increase in the level of performance exhibited a wave-like character, then in the push exercise, there was a steady monthly decrease in the rate of increase in the level of skill – 33-7-3 points per month.

The dynamics of the increase in the double-event sum for weightlifters from different weight categories during the study period are presented in Figure 3.

Legend: LWC - lightweight category; HWC - heavy weight category; ΣVK - sum of all weight categories.

Figure3. Dynamic analysis of the level of sportsmanship of the tested weightlifters in the double-event sum.

The amount of double-event reflects an integrated increase in the level of sportsmanship (STM) in two competitive exercises – snatch and jerk. For the lightweight category, the amount was 51 points (15%); for the heavyweight category, it was 142 points (38%). In general, the average values in all weight categories increased by 99 points (28%). When assessing the degree of growth in terms of trimesters, due to the changes in the snatch exercise, the trend is variable. In June–October 2017, the largest increase was observed, by 59 units; then the growth rates decreased by 14 units; and in February–May 2018, it again increased by 26 points.

The comparative analysis of the results of the increase in competitive exercises for weightlifters during the study period was performed using Student's t-test, and it is presented in Table 1.

Table 1
Reliability of the differences of the compared values of the level of sportsmanship according to Student's
t-criterion *

Snatch												
lightweight category					heavyweight category				All weight categories			
-	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018
October	>	-	-	-	>	-	-	-	>	-	-	-
February	>	>	-	-	>	>	-	-	>	>	-	-
May	>	>	>	-	>	>	>	-	>	>	>	-
Clean and Jerk												
lightweight category					heavyweight category				All weight categories			
-	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018
October	>	-	-	-	>	-	-	-	>	-	-	-
February	>	>	-	-	>	>	-	-	>	>	-	-
May	>	>	>	-	>	>	>	-	>	>	>	-
Total												
lightweight category					heavyweight category				All weight categories			
-	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018	June 2017	October 2017	February 2018	May 2018
October	>	-	-	-	>	-	-	-	>	-	-	-
February	>	>	-	-	>	>	-	-	>	>	-	-
May	>	>	>	-	>	>	>	-	>	>	>	-

* - $p > / < 0.05$

In total, 108 values were compared. Despite a number of seemingly significant differences between some of the compared values of the level of sportsmanship, none of them were significant. Therefore, we can only speculate about the nature of the identified changes. Clearly, the training cycle in junior sportsmen is an insufficient interval of time to observe serious changes in the level of sportsmanship and to evaluate the effectiveness of the developed method. However, the steady increase in competitive results is a good indication. The inaccuracy of the compared values may be associated with a large variation in the number of points (a high coefficient of variation), which may be affected by the age variation in this sample. The objectives of our research did not include the study of the relationship between the dynamics of STM with the training methods because it would be a much larger study. In addition, city weightlifters may have not recorded their training load entries honestly.

Conclusions:

According to the results of the research on the level of sportsmanship of weightlifters at the training stage of preparation in the jerk, snatch, and double-event during the period from June 2017 to May 2018, we observed a biased growth of results by an average of 28%. The dynamics of change in the sportsmanship during the research period in the heavyweight category was more significant compared to the lightweight category. For the jerk exercise, the increase in results was more significant than that for the snatch exercise. These observations are related to the natural biological development of junior-age weightlifters, which has a considerable influence on the jogging results and, especially, on athletes with a greater body mass. On the basis of the comparative analysis of TSM values for the competitive exercises for all trimesters, no significant differences were observed

for all compared options. **In conclusion**, the level of sportsmanship can be increased using the developed byus method of special physical training for the snatch exercise. This method is especially useful for the lightweight category weightlifters.

Conflicts of interest - the authors declare that there are no conflicts of interest

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