Features of strength training of girls 18-25 years old involved in bodybuilding

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Abstract

Objective of the study was to develop and experimentally test the methodology of strength training for girls aged 18-25 who go in for bodybuilding.

Methods and structure of the study. The experiment was conducted on the basis of the Regional Bodybuilding Federation of the Perm Territory, 18 girls aged 18-25 took part in it, divided into the control (CG) and experimental (EG) groups. In the EG, a method of strength training was introduced, based on the inclusion in the split-programs of sets of exercises performed on simulators, with free weights, jerk-braking exercises and exercises with rubber expanders. The strength abilities of the girls were assessed using control tests, assessment of fat and muscle components.

Results and conclusions. Thanks to the developed methodology, it was possible to significantly improve the strength abilities of the subjects of the experimental group in the "bench press" by 92.6%, in the "sitting press" by 58%, in the "squat with a barbell" by 68.6%, in "lifting the body from the position lying in a sitting position" by 42.4%, in "flexion-extension of the arms, in lying position" by 66%, to increase the muscle component and reduce the fat component, which is an indicator of the optimal form for participating in bodybuilding competitions.

Keywords: *bodybuilding, strength abilities, training methods, hypertrophy.*

Introduction. In the bodybuilding training process, the focus is on hypertrophy and symmetry of the muscle fiber, while the development of strength abilities is only of additional importance, while it is important to take into account the morphological and functional characteristics of girls [1]. That is why the strength training of girls for bodybuilding competitions should be based on the individualization of the training process based on the physiological characteristics of the female body [2].

Thus, a contradiction is revealed between the high potential of bodybuilding in terms of physique correction, increasing the level of physical condition, and the insufficient number of developed methods of strength training for girls aged 18-25. The above contradictions allow us to formulate the problem: what means and methods should be used in the strength training of girls 18-25 years old involved in bodybuilding?

Objective of the study was to develop and experimentally test the methodology of strength training for girls aged 18-25 who go in for bodybuilding.

Methods and structure of the study. The experiment was conducted in 2021 on the basis of the Regional Bodybuilding Federation of the Perm Territory (Perm), which was attended by 18 girls aged 18-25, nine people each in the control (CG) and experimental group (EG). In the training process of the girls of the experimental group, a strength training methodology was introduced, including sets of exercises performed on simulators and with free weights. The duration of the experiment was one year - 192 training sessions. Of these, 112 workouts were aimed at hypertrophy "mass gain", and 80 workouts were aimed at "drying" (40 sessions for the initial and final periods). At training sessions with girls, an individual approach was implemented in the preparation of training programs, mobile applications for

nutrition control (FatSecret, Yazio, LifeSum) were recommended, and individual recommendations were made on nutrition during the period of "mass gain" and "drying". The component body composition of girls was also monitored using the InBody720 hardware complex, the operation of which is based on bioimpedance analysis [4, 5].

Results of the study and their discussion. Based on the analysis of previous studies on the characteristics of the strength training of girls involved in bodybuilding, a method was theoretically developed and experimentally tested. The "method of strength training for girls" is understood as a set of means, methods and conditions aimed at achieving the goal (Figure 1). Methods used in the training process of the experimental group: circular, repeated efforts, maximum efforts, isometric efforts. The main means of developing strength abilities were the sets of exercises included in the split-programs performed on simulators, with free weights, jerk-braking exercises and exercises with rubber expanders.

A theoretical component was included in each training session with the girls of the experimental group, during which the features of nutrition during various periods of training, questions related to strength exercises, their impact on individual muscle groups were revealed, and an accompanying explanation was also given on the direction of different exercises.

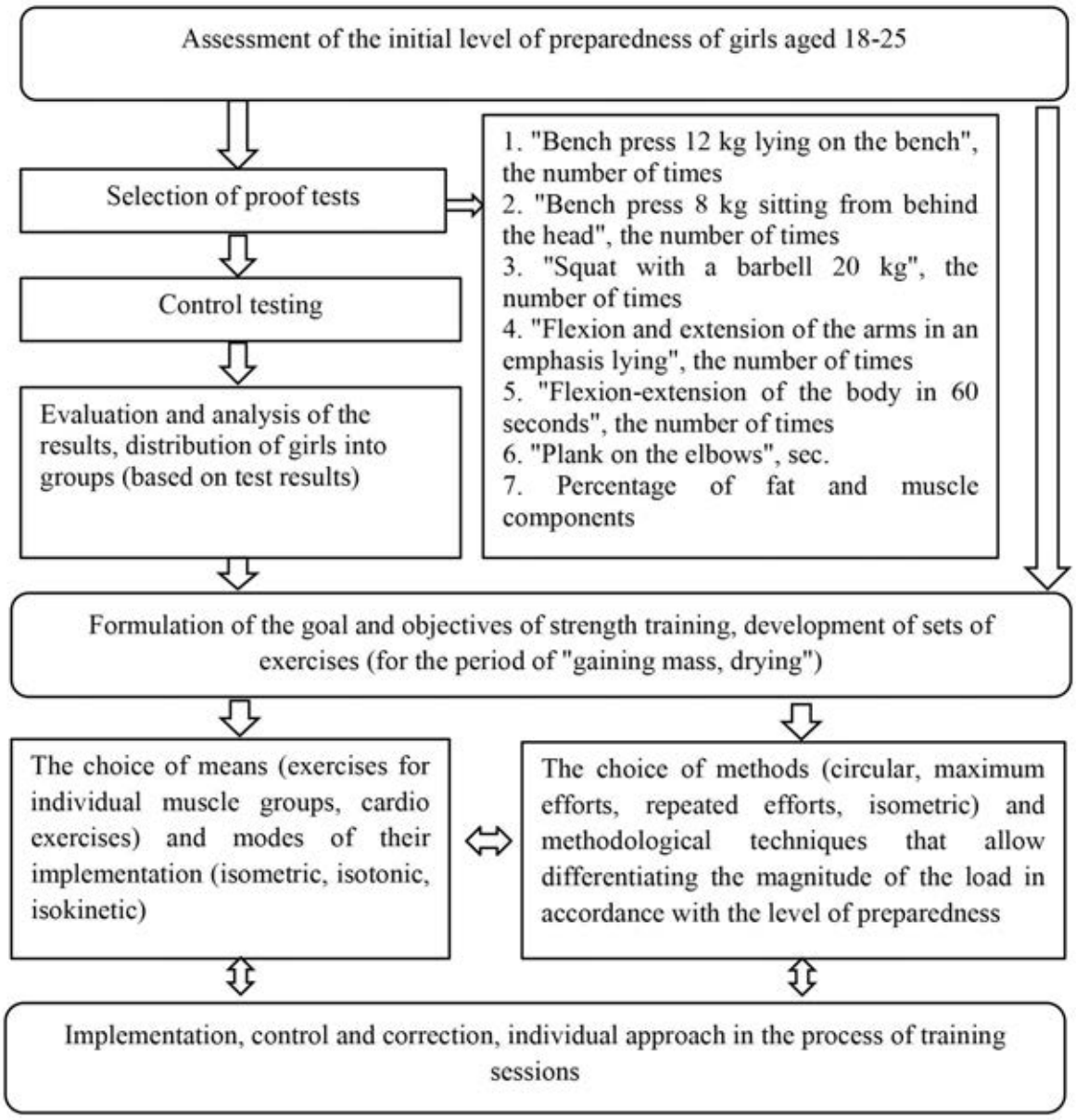

Figure 1. *Strength training methodology for girls aged 18-25*

For each training session, special complexes for the development of strength abilities were developed, containing various methods and means, depending on the period of preparation for "drying" or "mass gain". According to the developed methodology, 14 weeks (112 training sessions) were allotted for "mass gain", during the preparation period, the maximum effort method was preferred, the exercises were performed three to four approaches, the number of repetitions was 10-12 times. Mandatory control of nutrition and well-being of girls was carried out.

In turn, "drying" implies the implementation of a certain set of exercises, the most optimal method is circuit training, while the maximum load should not exceed 75-80% of the weight of those intended to increase muscle mass. During the "drying" period at each training session for 40-50 minutes (50% of the main part of the session), the advantage was given to cardio exercises, the intensity and duration of the complexes increased, the number of repetitions increased to 30. The results of the assessment of strength abilities are presented in the table.

The effectiveness of the developed methodology was confirmed by the following results of the subjects during the control tests: in the "Bench press lying on a horizontal bench" - the result in the EG increased by 92.6%, in the CG - by 52%, in the "Bench press sitting" - the result of the girls from the EG increased by 58%, CG - by 36.4%, in the "squat with a barbell" - in the EG - increased by 68.6%, in the CG - by 39.2%, the exercise "Flexion-extension of the body in 1 minute" - the result in the EG it increased by 42.4%, in the CG – by 11.2%, in "flexion and extension of the arms, in the lying position" – the result of the girls in the EG increased by 66%, in the CG – by 40%. A fixed difference in the results of the subjects of the experimental groups was found in all control trials at the end of the experiment, with higher values in the experimental group.

Next, we will consider how the indicators of body composition in girls have changed under the influence of the developed methodology during the period of "mass gain" and "drying" (Figure 2).

The data presented in Figure 2 indicate that the developed strength training technique turned out to be more effective than the generally accepted one in terms of its effect on the fat and muscle components, especially during the "drying" period. So, for example, in the EG at the end of the period, the percentage of muscle mass is 52.7%, and fat - 11%, which is an indicator of the optimal form for participation in bodybuilding competitions. Significant changes in the composition of the body, both during the period of "weight gain" and during the period of "drying", were influenced by the developed methodology, which also includes recommendations on nutrition, food intake and regimen.

Comparing the data obtained with the results of studies by D.V. Nikolaeva, S.G. Rudnev, we can conclude that in girls from the EG, with the content of the muscle component over 50%, and the fat component in the range of 11-13%, an increase in strength indica-

The results of the assessment of strength abilities in girls at the beginning and end of the experiment

Control test	Stages of the experiment	$\bar{x}\pm\sigma$		
		CG	EG	p
«Bench press (12 kg)», the number of times	start	16,2±0,9	17,8±0,9	>0,05
	end	23,1±0,9	34,35±0,88	<0,05
	p	<0,05	<0,05	
«Bench press sitting (8 kg)», the number of times	start	12,9±0,7	13,1±0,7	>0,05
	end	17,6±0,8	20,7±0,84	>0,05
	p	<0,05	<0,05	
«Barbell squat (20 kg) », number of times	start	32,4±2,0	34,3±3,0	>0,05
	end	45,1±2,3	58±4,3	<0,05
	p	<0,05	<0,05	
«Flexion and extension of the arms in an emphasis lying», the number of times	start	20,2±0,70	21±1,2	>0,05
	end	28 ±0,72	35±1,2	<0,05
	p	<0,05	<0,05	
«Bending-extension of the body in 60 s», the number of times	start	36±2,3	32,8±3,1	>0,05
	end	40±4,1	47±2,23	<0,05
	p	<0,05	<0,05	
«Elbow plank», s	start	61,8±7,3	58,7±5,3	>0,05
	end	89,2±9,3	120,4±8	<0,05
	p	<0,05	<0,05	

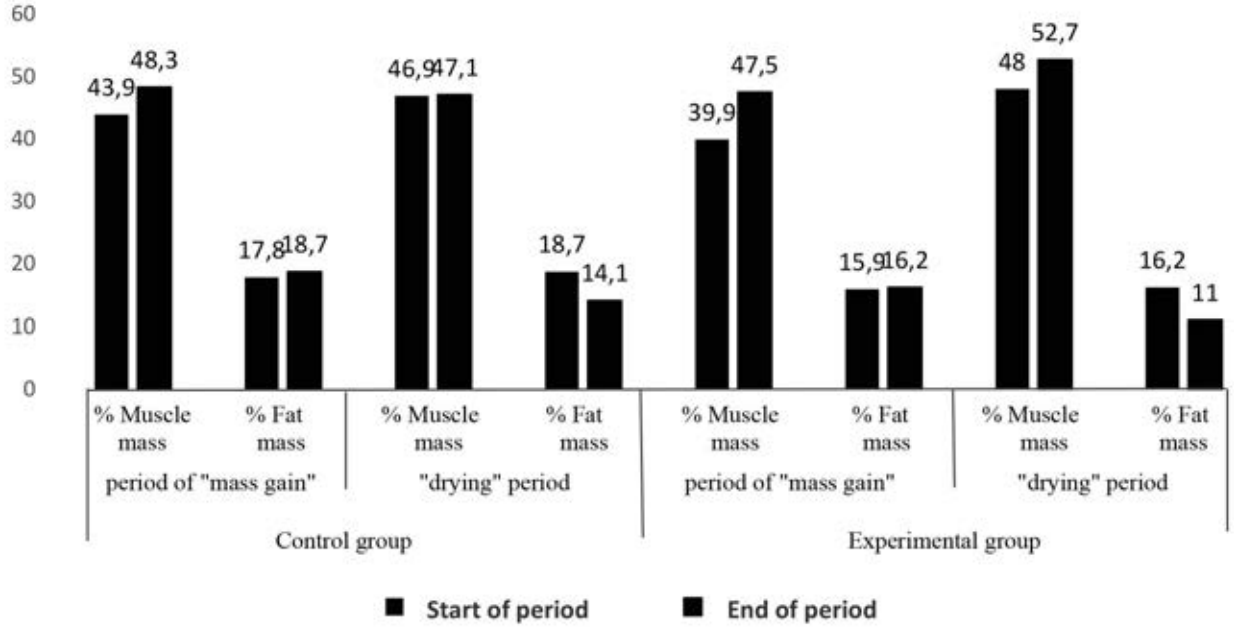

Figure 2. *Change in fat and muscle components in girls at the beginning and end of the experiment (results of bioimpedance analysis), %*

tors was also recorded [3]. Therefore, it is important to provide an individual approach to each athlete, strictly dose the load, exercise control over the quality of nutrition, and regularly undergo a medical examination.

C**onclusions.** he proposed methodology focuses on the features of the strength training of girls in different periods (mass gain and "drying"). So, in the period of weight gain, the girls used sets of exercises using training devices, the advantage was given to the maximum effort method. During the "drying" period, the proportion of cardio exercises increased, the complexes were implemented in a circular manner, with the emphasis on certain muscle groups. The training process was of an individual nature, which made it possible to achieve the optimal competitive form, without harming the health of the athletes. The proven method of strength training of girls aged 18-25 involved in bodybuilding has proven its effectiveness, as evidenced by the improvement in the results of control tests that evaluate strength abilities, and the results of bioimpedance research.

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