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INCREASING THE DEVELOPMENT LEVEL OF STRENGTH ABILITIES OF ATHLETES AGED 10-11 IN ACROBATIC ROCK AND ROLL

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Purpose: to substantiate the effectiveness of the author's program for the development of strength abilities of athletes aged 10-11 engaged in acrobatic rock and roll.

Material and methods: the study was conducted in the period from September 2019 to October 2020 on the base of the acrobatic rock and roll club "SUMMIT" in Kharkiv. The study involved 20 young athletes from 10 to 11 years old (10 boys and 10 girls). All studied athletes were engaged in the group of preliminary basic training of the 1st year of training. The following methods were used in the work: analysis and generalization of scientific and methodological literature; pedagogical experiment; methods of mathematical statistics.

Results: considering the level of physical fitness of athletes, a training program was developed for the integrated development of strength abilities of young athletes aged 10-11 years, who are engaged in acrobatic rock and roll. The program provided for an increase in the level of development of the strength abilities of the muscles: arms, shoulder girdle, neck, torso, and legs. The introduction of the training program helped to increase the level of development of muscle strength: the upper shoulder

girdle by 17,5% in boys and 22% in girls; torso muscles by 12,6% in boys and 10,2% in girls; explosive force of leg muscles by 0,9% in boys and 0,6% of girls.

Conclusions: because of the ascertaining experiment with the use of a specially developed training program in young men there was a significant increase of the development strength abilities level of the muscles of the upper shoulder girdle and torso ($p < 0,05$-$0,001$). As for girls, because of the implementation of the developed training program, the development strength abilities level of the muscles of the upper shoulder girdle significantly increased ($p < 0,05$-$0,001$).

Keywords: acrobatic rock and roll; strength abilities; training program, strength training, stage of preliminary basic preparation.

Introduction

Acrobatic rock and roll is a relatively new sport not only in Ukraine but all over the world. The rapid development and growth of its popularity determines the need of the development and scientific-methodological substantiation of specific methods of various sections of training athletes, especially beginners, as initial skills have a decisive influence on further success.

V. Adashevskiy [6] believes that sports training in acrobatic rock and roll is complicated by the technique of performance and the need to learn a large number of complex motor actions performed in pairs with music. B. Blasing, B. Calvo-Merino [8] found that dance elements and figures are characterized by a special style of performance - it requires considerable coordination and the ability to coordinate movements with almost all parts of the body.

According to P.M. Kizim [3], the most important components of the training process are the physical and technical fitness of athletes, which requires a rational method of training.

Sufficient physical fitness of athletes ensures the integrity, consistency, and safety of the training process, and is a criterion for the compatibility of partners for sports dancing [2, 9].

Since the development of all components of strength training is very important in the training system of young athletes engaged in acrobatic rock and roll, and plays an important role in ensuring effective mastery of acrobatic rock and roll techniques, the problem of optimizing the construction of physical training, and strength training, is relevant.

Connection of work with scientific programs, plans, themes. The study was performed in accordance with the research topic of the Department of Gymnastics, Dance and Choreography: "Theoretical and methodological principles of development of system-forming components of physical culture (sports, physical recreation, fitness) (2020-2025)". State registration number 0120U101215.

Purpose of the study. To substantiate the effectiveness of the author's program of complex development of strength abilities of athletes aged 10-11 who are engaged in acrobatic rock and roll.

Material and Methods of the research

The study was conducted in the period from September 2019 to October 2020 based on the acrobatic rock and roll club "SUMMIT" in Kharkiv. The study involved 20 young athletes aged 10 - 11 years (10 boys and 10 girls), who were engaged in the group of preliminary basic training of the 1st year of study. The following methods were used in the work: analysis and generalization of scientific and methodical literature; pedagogical experiment; methods of mathematical statistics.

Results of the research

At the beginning of the study, to develop a training program, it was determined the correspondence of the physical fitness level of the studied athletes and their age characteristics (table 1).

Based on the obtained data, it was found that the degree of muscle strength development of the upper extremities and torso and leg strength corresponds to the average level (score 4 points).

On the basis of the received data, there was developed the training program of complex development of power abilities of young sportsmen aged 10-11 years who are engaged in acrobatic rock and roll and are at a stage of preliminary basic

preparation. The developed program was introduced into the educational and training process and included physical exercises, which were aimed at the complex development of speed-power and relative-power abilities. During the ascertaining and shaping experiment, a group of young athletes performed daily specially composed sets of physical exercises aimed at developing the strength of the upper extremities' muscles, muscles of the neck and torso and leg muscles.

Table 1

Assessment of the physical fitness level of athletes aged 10-11 years at the beginning of the experiment (n = 20) (by Senitsa A.I., 2010 [5])

Control tests	Normative indicators of the preparedness level for the curriculum for CYSS (points)			Average group indicators of strength training of the studied athletes	
	«5»	«4»	«3»	Number of times	mark
	boys (n=10)				
Pull-ups on the crossbar, number of times	6	5	4	5	4
Flexion and extension of the arms at lying down, number of times	12	10	8	9	4
Raising straight legs to an angle of 90° in the height of the back to the gymnastic wall, the number of times	10	8	6	8	4
Running 30 m from a high start, s	5,5	5,8	6,0	5,7	4
Long jumps from a place, cm	175	170	165	169	4
girls (n=10)					
Pull-ups on the crossbar, number of times	4	3	2	3	4
Flexion and extension of the arms at lying down, number of times	10	8	6	8	4
Raising straight legs to an angle of 90 ° in the height of the back to the gymnastic wall, the number of times	8	6	4	6	4
Running 30 m from a high start, s	6,5	6,7	7,0	6,7	4
Long jumps from a place, cm	160	155	150	156	4

In the main part of the training session, after solving the tasks of technical training, physical exercises were performed, specially aimed at the complex development of strength abilities. The first three days of the week (Monday, Tuesday, and Wednesday) there were used exercises aimed at developing speed and strength

abilities. At the end of the week (Thursday, Friday, and Saturday) exercises were used to develop relative strength abilities.

After the introduction of the experimental program of strength training of the studied contingent of athletes, significant changes in the indicators of the manifestation of strength abilities were determined (Tables 2, 3).

Table 2

Indicators of the development level of strength abilities of the studied boys during the study period (n = 10)

Control tests	Indicators		t	P
	at the beginning of the experiment n = 10	at the end of the experiment n = 10		
	$X_1 \pm õ$	$X_2 \pm õ$		
Pull-ups on the crossbar (number of times)	5,2 ± 0,8	6,3 ± 1,2	4,71	<0,01
Flexion and extension arms in emphasis lying (number of times).	9,4 ± 1,4	10,7 ± 1,7	4,99	< 0,001
Raising straight legs to an angle of 90 ° in the height of the back to the gymnastic wall (number of times).	8,3 ± 1,3	9,5 ± 1,7	4,81	< 0,001
Running 30 m from a height start (s).	5,71 ± 0,2	5,66 ± 0,2	1,46	> 0,05
Long jumps from the place (cm)	169,1 ± 2,8	170,6 ± 3,9	2,24	< 0,05

Note: t_{kr}. 2,23

The analysis of the obtained data revealed significant changes after the implementation of the experimental program (p <0,05-0,001) in the indicators of the manifestation of strength of the upper extremities' muscles, which were determined by flexion and extension of the arms in the supine position and pull-ups on the crossbar for both boys and girls.

As for boys, the applied experimental program had a positive effect on increasing the strength level of the torso muscles, as evidenced by significant improvements in the test results by raising the straight legs to an angle of 90 ° at the height of the back to the gymnastic wall (p <0,001).

When performing other test exercises, it was found that the results in both boys and girls tended to increase, but these differences were not significant (p> 0,05).

Table 3

Indicators of the development level of strength abilities of the studied girls during the study period (n = 10)

Control tests	Indicators		t	P
	at the beginning of the experiment n=10	at the end of the experiment n=10		
	$X_1 \pm õ$	$X_2 \pm õ$		
Pull-ups on the crossbar (number of times)	3,2 ± 0,8	4,1 ± 1,0	3,86	< 0,01
Flexion and extension arms in emphasis lying (number of times).	7,8 ± 1,6	8,9 ± 1,9	4,71	< 0,01
Raising straight legs to an angle of 90 ° in the height of the back to the gymnastic wall (number of times).	6,2 ± 1,5	6,9 ± 1,7	2,08	> 0,05
Running 30 m from a height start (s).	6,71 ± 0,2	6,68 ± 0,2	1,15	> 0,05
Long jumps from the place (cm)	156,2 ± 3,1	157,1 ± 3,1	2,08	> 0,05

To determine the impact of the developed training program, the increments level of speed-power development and relative-power abilities of the studied athletes were calculated (Figs. 1, 2).

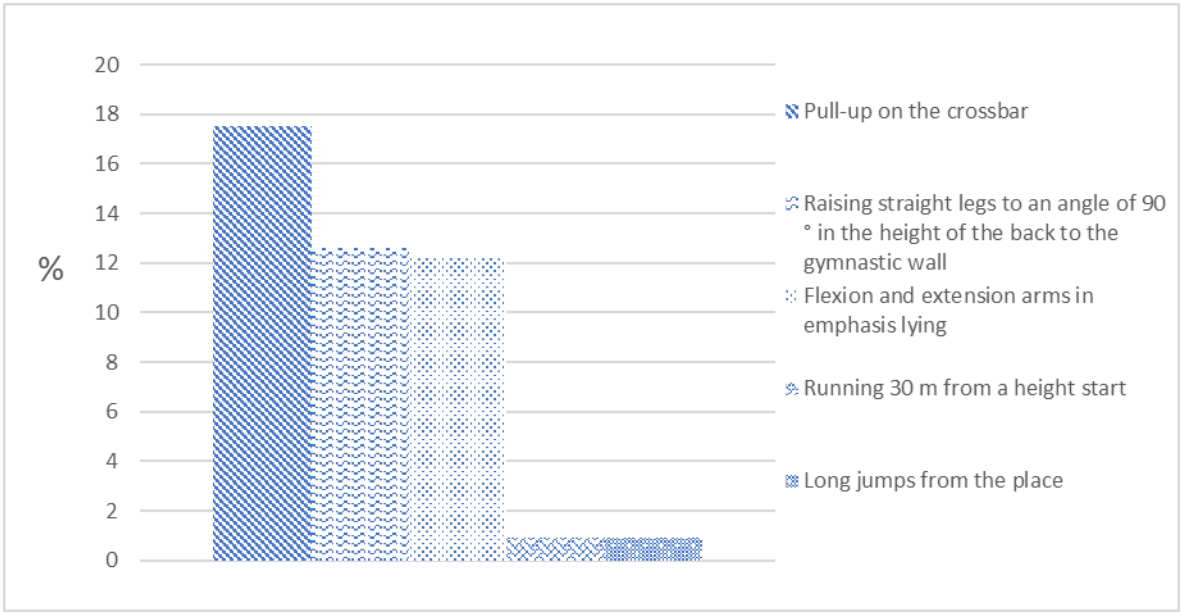

Figure 1. The increase in the level of speed-power development and relative-power abilities of the studied guys during the experiment

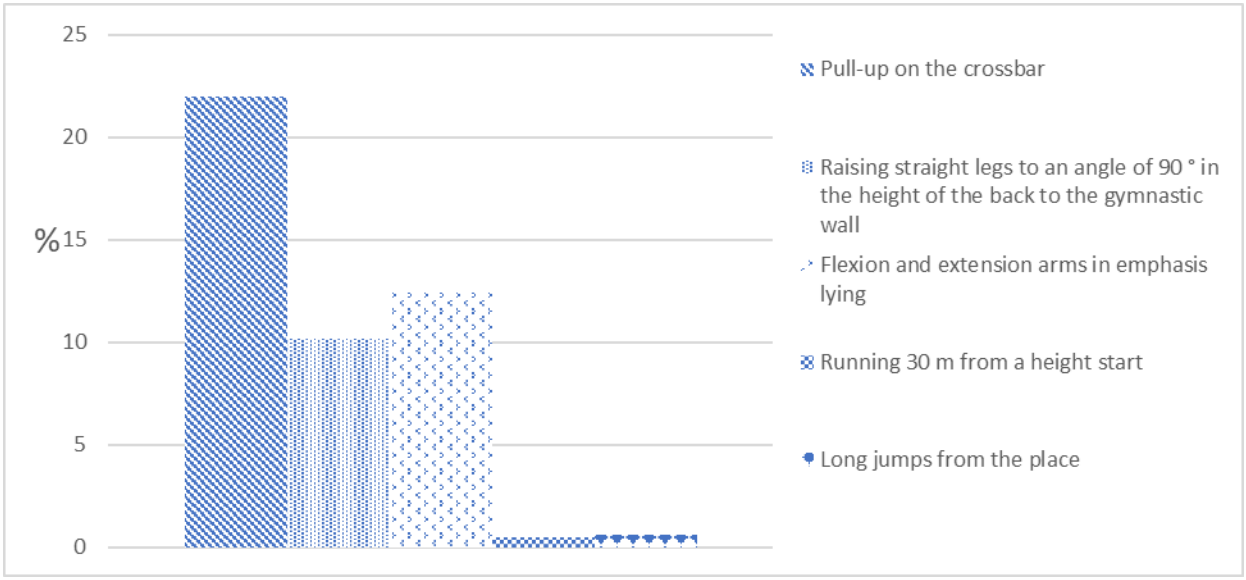

Figure 2. The increase in the level of speed-power development and relative-power abilities of the studied girls during the experiment

The analysis of the growth of the boys' results revealed the greatest influence of the developed program of strength training on the development level of strength abilities of the upper extremities' muscles by 17,5% and the torso by 12,6%. The developed training program had the least impact on the development level of boys' speed strength by 0.9%.

Analysis of the results of the increase in strength training of girls revealed the most effective influence of the developed program on the development level of strength abilities of the upper extremities' muscles by 22%. The smallest influence of the developed program as well as at guys was observed on the development level of speed force by 0,6%.

Conclusions / Discussion

The study confirmed the information of Lutsenko L.S., Bateeva N.P. [1, 4] of the importance of strength in training in acrobatic rock and roll. In the works of Anca I., Kim N. [7, 10] special attention is paid to the training of flexor muscles, as the development level of strength of these muscle groups largely depends on the success in mastering the technique of exercise, but the proposed strength programs training does not involve the integrated development of the strength of certain muscle

groups. The results of the study complement the information of Bateeva N.P., Kravchuk T. [1, 11] regarding physical training in acrobatic rock and roll.

Conducting a formative experiment using a specially designed training program for integrated development of strength abilities revealed that under the influence of systematic training and the applied experimental program in boys there is a significant improvement in muscle strength of the upper extremities, torso, and legs ($p < 0,05$-$0,001$), in addition to speed indicators ($p > 0,05$), and as a consequence of increasing its level from medium (4 points) to high (5 points).

In girls, because of the implementation of the developed training program, significantly improved muscle strength of the upper extremities ($p < 0,05$-$0,001$), and as a consequence of increasing its level from medium (4 points) to high (5 points). However, the level of development of torso and leg muscle strength ($p > 0,05$) remained at the starting position - average (4 points).

In boys, the developed training program had the greatest impact on the level of development of strength abilities of the upper extremities' muscles and torso, which are 17,5% and 12,6%, respectively. In girls, because of the application of the developed training program, the largest increases were observed in the level of development of strength abilities of the muscles of the upper extremities, which is a percentage of 22%.

Prospects for further research. It is planned to establish the relationship between the development level of speed-power and relative-power abilities and indicators of the technical training level in acrobatic rock and roll.

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