

An improvement of competitive exercises performing on the rings by 10–12 year old gymnasts using special physical training

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Purpose: to reveal the influence of the level of special physical readiness of gymnasts of 10–12 years on the technique of performing exercises on rings.

Material & Methods: for the task of testing the level of special physical and technical preparedness were carried out gymnasts of 10–12 years, who are trained on the basis of Sports School of high sportsmanship Kharkov.

Result: based on the results of the study, the dynamics of qualitative and quantitative indicators of the level of special physical preparedness of gymnasts aged 10–12 years and its influence on the technique of performing a competition program on rings.

Conclusion: results of the experiment confirm the effectiveness and significance of the use of special physical training that positively influence the technique of performing a competitive combination on the gymnasts' rings during the preliminary basic training.

Keywords: gymnasts 10–12 years, the level of special physical preparedness, level of technical preparedness, competitive program, testing, rings.

Introduction

Gymnastics is a complex coordinated sport with the performance of competitive combinations on gymnastic apparatus. Qualitative performance of gymnastic all-round exercises is due to the corresponding level of special physical preparedness of athletes. According to experts in gymnastics, the technical training of athletes is carried out on the basis of advancing development of special physical qualities, that is, there should be an outstripping development of physical qualities in relation to the technical training of gymnasts [1; 5; 8]. In modern competitive programs, the leading gymnasts show the highest technical skill with the maximum manifestation of physical qualities that merge into a single whole, reflected in original ties and combinations [7]. The effectiveness of the training process is directly dependent on the means used in the classes with athletes in accordance with physiological characteristics [4].

Rings – this is the only gymnastic projectile with a mobile support, determines the specifics of exercises of this kind, which combine a pronounced flaring dynamics, high demands on the accuracy of actions, balance in the stops and special power training of gymnasts [2; 3; 8]. When performing exercises on the mobile support, the gymnast experiences an abrupt increase in the shock-type load on the motor apparatus, which requires a high level of special physical readiness. Analysis of literary sources and video materials showed that since the beginning of the 1980s another leap occurred in the development of this type of all-around – forgotten strength exercises began to revive and combine with the flight, demanding from the gymnasts the development of muscle strength, speed-strength abilities, flexibility, orientation in space, a sense of balance, etc. [1–3; 5; 8]. Thus, particular relevance optimization special physical training of young gymnasts to improve their technical readiness

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Material and Methods of the research

Experiment, which was attended by eight gymnasts of 10–12 years, was held in Kharkov on the basis of the Sports School of high sportsmanship (SSHS) in artistic gymnastics. In the course of the study, at the beginning of the experiment, an assessment was made of the level of special physical preparedness of gymnasts and an assessment of the level of their technical preparedness in performing a competitive combination on rings. Main purpose of the study was to identify the dynamics of qualitative and quantitative indicators of the level of special physical preparedness and its influence on the technique of compulsory program execution on rings.

After the initial testing, the young athletes were trained according to the Curriculum for the Youth Sports School [6]. Means of sports training were physical exercises that directly or indirectly influenced the improvement of the skill of gymnasts. Gymnastic exercises were deliberately selected by the coach for solving the main tasks of the training process – training, education of physical qualities and perfection in the chosen sport. Volume of gymnastics used during the preliminary basic training was conventionally divided into four main groups. First group included competitive exercises on gymnastics, which were the subject of specialization and were performed in accordance with the conditions of the competition. Second group included general development exercises for the comprehensive physical development of gymnasts. In the third group preparatory special exercises designed for training and development of physical qualities. To the fourth group exercise of other sports. According to the program for the Youth Sports School of gymnastics, the training process for children aged 10–12 years during the study was based on

general, special physical, special-motor and sports-technical training, the ratio of which was approximately 1:3 training time. Preservation of the specific weight of general, special physical and special-motor training was associated with the growing demands on the level of development of physical qualities and the special-motor preparedness of gymnasts of this age [6].

Methods of research: theoretical analysis and generalization of literary sources; pedagogical observations; testing; pedagogical experiment; methods of mathematical statistics.

Results of the research and their discussion

To summarize the results of the experiment, a comparative analysis of the level of special physical and technical preparedness of young gymnasts for the study period was made (Table 1).

When performing the “Run on 20 m” (s) test, which characterizes the level of development of speed, the young gymnasts showed a average group result of 4,1 s at the beginning of the study and 3,9 s at the end. According to the Student’s test, the difference between the average results shown by the athletes in this test is statistically unreliable because t_c less t_{gr} . (Table 1). To assess the level of development of speed-strength readiness of gymnasts of 10–12 years used the test «Standing long jump». Results of the study showed that in September 2016 they performed this exercise with a average group result of 155,4 cm, and in March 2017 – 158,9 cm. Difference between these indicators is not statistically significant, since $t_c=0,83 < t_{gr}=2,15$. When performing exercises “Rope climbing” (rate of force development) boys, who are engaged in gymnastics, showed an average result of 7,9 s at the beginning of the study and 7,0 s at the end. A comparison of these results by the Student’s test shows that the difference between the mean group values is statistically significant ($p < 0,05$). This indicates that the conduct of the training process for six months contributed to an improvement in the mean group result in the study group (Table 1). As can be seen from the materials presented, in the test for the development of the force “Lifting by force on rings”, the children of the study group showed an initial average result of 4,8 times and a repeat average of 6,1 times. Difference between these indicators is statistically significant, since $t_c=2,85 > t_{gr}=2,15$. This means that at the end of the study the results improved objectively. Results of the study indicate that during the “Horizontal suspension back on rings” exercises gymnasts aged 10–12 years showed results

of 9,4 s and 11,1 s for initial and repeated testing, respectively (Table 1). Difference between the mean group results from this test is statistically significant, since $p < 0,05$. Results of the children in this test allow us to confirm the effectiveness of training sessions. During the next test to determine the level of development of the athletes’ strength readiness “Stance by force on uneven bars”, the initial result was 5,8 times, and the repeated result – 7,0 times. According to the Student’s test, the difference between the average results in this test is statistically reliable, since t_c more t_{gr} . (Table 1). This indicates that training in the studied group of gymnasts contributed to an improvement in the group’s average result for this test. In the process of comparative analysis of indicators of development of flexibility in the “Twisting gymnastic sticks” test, revealed no significant improvement of results in the group of gymnasts ($p > 0,05$).

During the period of the study, in the group of gymnasts, the indicators of the development of their technical readiness have undergone significant changes, they have been studied according to the indicators of the combination on rings (obligatory program for I class): from the visibility on the rings by twisting in the shoulder joints, the transition to the viscous bending, unbending the forwards forward on the bent hands, swinging forward, hastening, backwards; swing forward, jump off in full swing backwards (quality of performance of a combination in points is evaluated. Penalties for errors) (Figure 1) [6].

These changes (Table 1) can be explained by the fact that work with gymnasts to improve the quality of performing a competitive combination on the rings for the I category was carried out simultaneously in two directions: improving the strength and speed-strength qualities of gymnasts, necessary to perform a competitive combination on the rings, and individual work on technical mistakes made by gymnasts when performing a combination on rings. According to the results of the individual performance of the competitive combination on the rings during the study (Figure 1), it should be noted that the improvement of the combination is observed in all gymnasts of the study group.

Gymnasts who occupied the leading positions on the basis of the initial performance of the competitive combination (gymnasts No. 4 and No. 8), and remained the leaders. Group’s outsiders on the basis of the primary testing (gymnastics No. 2, 3 and 5) also improved their results, but failed to catch up with the leaders of the group. Maximum increase in marks

Table 1
Level of development of special physical and technical readiness of gymnasts 10–12 years according to the results of the research (n=8)

No. i/o	Test	$\bar{X} \pm m$		t_c	t_{gr}	p
		Primary results	Repeated results			
1.	Run on 20 m (s)	4,1±0,08	3,9±0,08	1,36	2,15	>0,05
2.	Standing long jump (cm)	155,4±3,06	158,9±2,94	0,83	2,15	>0,05
3.	Rope climbing (s)	7,9±0,26	7,0±0,23	2,53	2,15	<0,05
4.	Lifting by force on rings (times)	4,8±0,40	6,1±0,28	2,85	2,15	<0,05
5.	Horizontal suspension back on rings (s)	9,4±0,46	11,1±0,35	3,00	2,15	<0,05
6.	Stance by force on uneven bars (times)	5,8±0,26	7,0±0,30	3,16	2,15	<0,05
7.	Twisting gymnastic sticks (cm)	14,1±0,70	13,0±0,66	1,17	2,15	>0,05
8.	Competitive combination (points)	7,7±0,10	8,1±0,07	3,03	2,15	<0,05

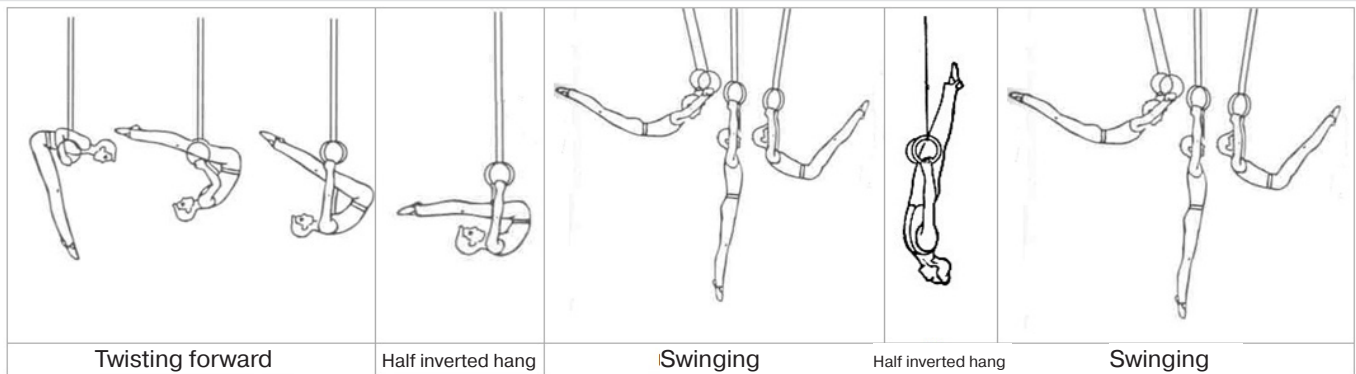


Fig. 1. Combination on rings (obligatory program for I class)

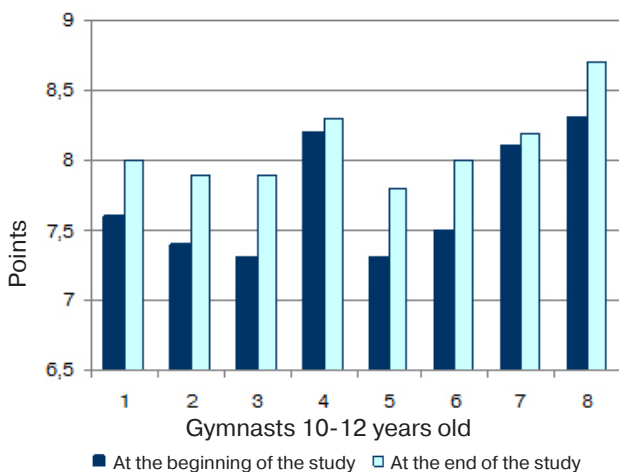


Fig. 2. Evaluation for the performance of a competitive combination on the rings at the beginning and at the end of the study

(0,6 points) for the combination is observed in gymnast No. 3; Minimum (0,1 points) – for gymnasts No. 4 and No. 7.

Thus, the results of the competitive combination of the I category indicate the effectiveness of the training process and the use of an individual approach to work with gymnasts, as well as the complex work carried out to improve the performance of exercises on the rings.

Conclusions

Analysis showed that during the study of the training process gymnasts at the stage of preliminary basic training, there were positive changes in the test tasks that characterize the level of special physical and technical preparedness. At the end of the study, for most test tasks, statistically significant differences were recorded based on the results of primary and repeated testing, except for tests – run on 20 m; standing long jump; twisting gymnastic sticks. So, following the results of the training process during the study, the group of gymnasts managed to achieve a statistically significant growth of only strength qualities. This fact suggests that the means and methods used by the coach during this period worked better for the development of the strength of the gymnasts than speed-strength and flexibility. The training process in the study group as a whole provided a comprehensive impact on improving the physical qualities of gymnasts and improving the quality of their training combination. Increase in the level of special physical preparedness positively influenced the technique of fulfilling the obligatory combination on the rings (in particular, the average score for the completion of the training combination increased from 7,7 to 8,1 points).

Prospects for further research. In the future, it is planned to assess the effect of the level of special physical training of young gymnasts on the technique of performing exercises in other gymnastic apparatus.

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