

## Development of the Vestibular Apparatus of 6-7-Year-Old Gymnasts

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### ABSTRACT

To study the functional status of some parameters of the cardio-respiratory system of gymnasts engaged in rhythmic gymnastics on the basis of anthropometric methods, the level of physical development of gymnasts aged 12-14 years to study cardio-respiratory and physiological changes during training.

### Material and Methods

We have set ourselves the goal of making our children, starting from childhood - mainly school age, consider sports as a constant companion in their lives, making them lifelong friends with sports, and creating all the conditions and opportunities for this.

Nowadays, physical education and sports have become one of the main and important directions of state activity. In order to raise a healthy generation, it is necessary to develop physical education and sports among children and teenagers. In the last decade, there have been significant changes in rhythmic gymnastics, which are related to the complexity and danger of the exercises performed on the one hand, and the sharp rejuvenation of the participants on the other hand. The problem of early selection of a specialty imposes its own requirements, and experts have a difficult problem to solve - the problem of determining children's ability to engage in rhythmic gymnastics at the selection stage and the first stage of preliminary training. It should be taken into account that performing complex circular movements in space without support requires sufficiently improved functions of various analyzers, therefore the problem of learning the position of the vestibular apparatus of young gymnasts and improving it in the subsequent training processes is very important and is considered one of the important tasks for sports gymnastics coaches.

**The purpose of the study:** to achieve an increase in the level of development of the vestibular apparatus in gymnasts at the initial stage of training. Тадқиқот вазифалари:

- 1) to determine the level of development of balance skills in young gymnasts;
- 2) choosing exercises that are most effective for developing balance skills.

Vegetative reflexes in healthy children vestibular apparatus normal reflex work, sports, etc. it is formed when it vibrates (shakes) when it is affected much more strongly than the effects that call for its actions. Under the influence of vestibular apparatus training, these autonomic reflexes are reduced and even disappear completely. For example, by 13-14 years of age in boys who regularly play sports, and by 10 years of age in girls, the functions of the vestibular apparatus reach the level of adults who do not play sports, and in teenagers who regularly play sports, it reaches 2-3 years earlier than in those who do not play sports. As schoolchildren get older, proprioceptors are more stimulated. Proprioceptors are the least stimulated in junior high school students, and the most in high school students. The most arousal of proprioceptors was observed during the days and hours of work classes, physical education lessons, extracurricular activities in sports sections, games and outings outside of school, and the least arousal was observed in hours with relatively little movement (in general education classes at school, during preparation for lessons). The excitability of proprioceptors increases in the first half of the day and decreases in the evening. In high school students, mental activity (reading fiction for 30 minutes) in most cases increases the excitability of proprioceptors.

Stimulation of proprioceptors in schoolchildren during play or work and physical exercises leads to an increase in mental performance. When practicing proprioception, its development is accelerated. For example, the ability to distinguish the tone of the muscle groups of the right and left hand and the movements of the joints of the hands and feet of children who regularly play sports is much higher than that of children of the same age who do not play sports. The development of proprioception in children who play sports is uneven and accelerates at the age of 7-8 and 13-14 years.

Kinesthesia develops with age and improves with training. The ability to distinguish the length and thickness of small objects and the weight of small loads at the eye level gradually increases in children and adolescents from 8 to 18 years old. When people who can see close their eyes, and in congenitally blind people, the greatest growth of this ability is observed at the age of 13-14 years. However, due to the constant training in the blind, this ability is superior to that of the sighted. Increasingly, the accuracy of differentiation of muscle tension changes when lifting medium-weight loads with eyes closed. Muscle sensation when lifting these loads improves until puberty, when they become markedly worse. After puberty, muscle sensation becomes well-differentiated again and reaches its greatest precision by 16-17 years of age. Muscle sensation is most clearly distinguished when lifting heavy loads 50-70% of the maximum size. The younger the children, the more often their muscle tone is less than specified. When the flexor muscles of the fingers are shortened, the accuracy of differentiation is greater than when the flexor muscles of the wrist are shortened. The greatest increase in separation accuracy occurs at the age of 8-13 years, from 14 to 17 years it increases slightly in boys and slightly decreases in girls. Training increases it. The maximum accuracy of the difference in the amplitude of movements in the shoulder and wrist joints is less than that of the knee both on the right and left sides, and even less in the joints connecting the foot, the core of the foot with the finger bone, and the tibia bone with the heel bone. From 8 to 11 years of age, the accuracy of distinguishing movements decreases as their amplitude decreases, and at 16-17 years, on the contrary, it decreases as the amplitude of movements increases.

Separation of the speed of movements is 2 times more in girls at the age of 13-16 than at the age of 7-8. 7-8-year-old girls speed up the pace much more towards the end of the exercise than 9-12-year-old girls and 13-16-year-old teenage girls. Therefore, the younger the children, the less they distinguish the frequency of movements. This distinction narrows with age, but there is no significant difference between 13-14- and 15-16-year-old girls. At the age of 13-14, the lability of the nervous system is optimized, and proprioception (muscle sensation) is almost maximally improved.

Speed-power movements develop muscle sensitivity in adolescents not only in the type of movements that are trained, but also in other untrained movements.

Under the influence of production practices, the sharpness of kinesthesia increases in students of craft schools. Special games improve kinesthesia, clarify movements. Daily practice games develop coordination of movements much more than 2 times a week games. Kinesthetic sensations are clearly defined when healthy children perform movements with their eyes temporarily closed, so they determine the number of hits on the target when performing further training with their eyes open. Thus, temporary training with closed eyes increases and improves the independent functioning of kinesthesia, which is combined with vision when the eyes are open. Even in a 3-year-old child, the unconditioned proprioceptive reflex of the heart plays a significant role in involuntary movements, while the conditioned reflex acceleration of the heart upon receiving a signal about the need to perform physical work is not always present in 3-6-year-old children and is observed in everyone only from the age of 7.

In young children, when performing physical work and physical exercises, conditioned reflexes of heart work are formed faster, but they differ in that they are less constant than in older children. As they grow older, the reflexes of internal organs increase, and they improve even more during the formation of labor and sports movement skills.

A pedagogical experiment was organized to check the effectiveness of the complex exercises designed to develop the ability to maintain balance. 2 groups of 6-7-year-old gymnast girls took part in the experiment. Each of these two groups consists of 8 people. The first group - the control group trained according to the standard methodology under the guidance of the trainer, and the second - the experimental group engaged in complex exercises specially designed by the trainer and the researcher.

## **Results**

During the pedagogical monitoring of the training processes of young gymnasts, it was determined that the exercises for the development and improvement of physical fitness are as follows:

Head position - legs straight, heels together, hands down.

Bending the head down - exhalation, raising the head - inhalation.

Turning the head - to the left, to the right 10-15 times.

Bend the head to the left shoulder, head position, bend the head to the right shoulder - 10-15 times. Head rotation – left to right and right to left.

Lowering the head - exhalation, raising the head - inhalation.

After 8-10 days, additional exercises should be introduced:

Head position - hands down, feet wider than shoulder width.

Breathing. On exhalation, bend to the left leg, reach for it with hands, return to the head position, the same for the right leg.

Hands on the waist - inhale, turn the body to the right - exhale, so to the left.

Grab the chair seat with your hands, throw the body back - inhale, return to the head position - exhale.

Repeat each exercise 8-10 times. Exercises are performed at the same speed, without tension. Breathing is done through the nose in a calm state. After 10 days, this set of exercises is performed in a standing position, feet shoulder width apart, holding the shoulder of a chair. After

10 days, if there are no negative conditions, it can be done without a chair or application. Head position - legs wider than shoulder width, hands down.

The following exercises can be added at this stage.

Raising the hands up - inhale, bend forward, touch the hands to the floor, - exhale. Breathing evenly, through the nose. Exercises are performed first with eyes open, then with eyes closed.

**Indicators of physical development of the 6-7-year-old control group**

	Surname, name.	Experimental conditions	Time to maintain body balance, min.			
			1	2	3	4
1.	Mirvalieva Mubina	1. With eyes open	25	19	6	6
		2. While closing the eyes	18	16	5	4
2.	Mimurova Lyudmila	1. With eyes open	20	10	5	7
		2. While closing the eyes	11	14	2	5
3.	Rakhimjanova Bibisora	1. With eyes open	42	41	41	49
		2. While closing the eyes	48	52	55	56
4.	Abdumannopova Markhabo	1. With eyes open	48	45	50	56
		2. While closing the eyes	50	48	53	59
5.	Ibrokhimova Khilola	1. With eyes open	41	18	25	48
		2. While closing the eyes	45	16	37	51
6.	Hashimova Adolat	1. While closing the eyes	50	20	40	50
		2. While closing the eyes	53	21	38	53
7.	Ergasheva Raykhana	1. With eyes open	52	40	50	56
		2. While closing the eyes	55	46	56	54

Another important indicator is heart rate. The frequency of contraction of the heart is of great importance to determine the functional state of the human body, especially when studying the effects of physical exercise.

**Pulse frequency readings of the control group at rest and after stimulation of the vestibular system for one minute (Decrease in heart rate per minute.)**

№	Surname, name.	Кўрсаткичлар	
		In a calm state	When excited
1	Mirvalieva Mubina	112	120
2	Mimurova Lyudmila	104	116
3	Rakhimjanova Bibisora	80	96

4	Abdumannopova Markhabo	84	100
5	Ibrokhimova Khilola	112	136
6	Hashimova Adolat	80	104
7	Ergasheva Raykhana	112	132

## Discussion

The results of the study indicate that the indicators of the ability to static balance in children improve with age. At the same time, according to the magnitude and reliability of the results, it can be confirmed that the 6-7-year-old period of girls is sensitive and comfortable in the development of this ability (although in only three out of 11 control exercises in girls: In the Romberg test (according to the modification of V.G. Strelets) when standing with the head in a straight (natural) position and bending it forward, as well as in the "Swallow" type, with the condition of looking at the front horizontal balance on the right leg - there is reliable growth; in the remaining 8 control tests, no statistical significance was observed in the increase of the results, apparently, the reason for this may be the considerable stimulation of the organs and systems that maintain the balance of the body as a result of taking these indicated conditions.

## Conclusion

1. As can be seen from the obtained results, the results can be said to be good considering the age of the children. It should be taken into account that they are engaged in rhythmic gymnastics and that the vestibular apparatus is well developed for this age.
2. According to the results of the research, it can be said that the vestibular apparatus is worse developed in children who do not do rhythmic gymnastics.
3. As a result of comparing the results obtained in both groups, it can be said that the results in the group of children who practice rhythmic gymnastics are much better than the group of children who do not practice rhythmic gymnastics.
4. According to the results of the conducted pedagogical experiments, it can be concluded that the proposed complex exercises for the development of the ability of 6-7-year-old girls in space were effective, because the level of development of the ability of space in gymnastic girls engaged in the proposed system of exercises increased.

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