RUSSIAN JOURNAL OF
SPORTS SCIENCE
2022, Vol. 1 (3)

Publication date: 01.10.2022
DOI: 10.51871/2782-6570_2022_01_03_8
UDC 37.037.1

METHODOLOGICAL FEATURES OF THE FLEXIBILITY DEVELOPMENT IN 7-8 YEARS OLD RHYTHMIC GYMNASTS

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Annotation. Rhythmic gymnastics is one of the most spectacular and beautiful sports. Flexibility as one of the main physical qualities, which is very important to develop in young gymnasts. The development of flexibility has been studied by many authors, but the use of weights, strength exercises for the development of flexibility with children aged 7-8 years has not been given due attention. The purpose of the study is to experimentally substantiate the effectiveness of using the method of combined development of flexibility and strength, aimed at developing flexibility in children aged 7-8 years engaged in rhythmic gymnastics. The results obtained in the course of the pedagogical experiment on the use of specially designed sets of exercises for the development of flexibility allow us to conclude that the use of the method of combined development of flexibility and strength in the training process, in addition to generally accepted exercises, improves the development of mobility in the joints and flexibility of the spinal column in 7-8 years old rhythmic gymnasts.

Keywords: training process, rhythmic gymnastics, flexibility, strength, the method of combined development of flexibility and strength.

Introduction. Rhythmic gymnastics is a popular sport among girls in Russia and the world. The competitive program includes more complex elements that require good physical and mental training of athletes. Success in rhythmic gymnastics in case of relatively equal level of physical, technical and psychological training of gymnasts will depend mainly on the development of flexibility. Flexibility must be developed continuously, gradually, in accordance with age features, volume and intensity of loads must be appropriately distributed.

Researchers, experts in physical culture and sports – Matveev L.P. [1, P. 273], Platonov B.M., Stepina K.N., Voropaeva V.V., in rhythmic gymnastics – Nazarova O.M., Kryuchek E.S., Medvedeva E.E., Suprun A.A., Viner-Usmanova I.A., Terekhina R.N. [2] confirm significance of developing flexibility as a necessary condition to master the technique of motor movements in different sports. Verkhoshanskij Yu.V. [3] examines some regularities that determine the qualitative development of physical qualities, flexibility in particular, in accordance with age and gender differences.

This topic is deemed relevant, since today sport becomes "younger", there are more requirements to children, and coaches face a difficult task: they have to search for such methods and ways so that students can easily and with positive emotions master new, complex elements in gymnastics, and in order to study them and perform them in the future, it is necessary to develop flexibility. The development of flexibility is comprehensive in the training process of rhythmic gymnastics classes with children aged 7-8 years. Proper, technically correct ("clear") performance of gymnastic elements depends directly on a gymnast's flexibility. It is important to know and apply appropriate methods to develop this quality [4-9].

For this study, we need to examine some features of flexibility. According to the L.P. Matveev's definition [1, P. 273], "flexibility", in terms of physical qualities of a human, is a property of elastic stretchability of bodily structures (mainly muscle and connective), which determines the limits of the amplitude of the body links' movement [1].

There are two types of flexibility – active and passive. Active flexibility is a maximum possible mobility in the joint, which a gymnast can demonstrate independently, using only their strength. Passive flexibility is a highest movement amplitude, which is usually achieved with the external help: with the help of a partner, a projectile or a weight. Active flexibility is more appreciated in gymnastics, since it supports natural freedom of movements and allows mastering correct technique of elements [1]. However, in order to achieve good joint mobility, you have to develop both types of flexibility.

There are also general and specific flexibility. Maximum amplitude in major joints is typical for general flexibility, while specific flexibility is connected to a performance of a certain motor action [1-2].

According to the analysis of special literature and author methods, we can present following features of developing flexibility for rhythmic gymnasts.

Sequence of performing flexibility exercises: 1) exercises for higher limb joints and shoulder girdle, 2) trunk, 3) lower limb joints.

A training session starts with warm-up exercises [4], then, at the end, performance of stretching exercises is obligatory. The load increases gradually by increasing the number of the exercise's repetitions, intensity or number of sets.

There is a great number of hard exercises, which must be studied for a very long time and carefully, for example, turns, cartwheels, bending back from various positions, etc. These complicated exercises require an individual approach to a child. When learning hard elements and exercises, a coach has to show mistakes, ensure safety and help to prevent injuries [2, 4, 9].

Success of developing physical qualities of young gymnasts is defined in many cases by some methodological techniques that are used by a coach during sessions: exercises with unusual names, e.g. "froggy", "little birch", "little boat", "kitty" – the task is perceived by ear very easily and raises the mood [4]. Sessions in form of games: various relay races, outdoor games and tasks cause gymnasts to feel the ease when performing gymnastic elements, and some exercises (combinations) are learned better if they are used in a game [1-2]. The girls are required to show initiative, courage, assertiveness, ability to work in a team – those are the features of the playing activity. It has a very positive impact on the training process.

L.P. Matveev [1] identifies such methods of flexibility development as the method of combined flexibility and strength development, the method of multiple stretching, the method of static stretching (static-active stretching, static-passive stretching, isometric stretching).

The researcher also notes [1, P. 275] that "development of flexibility is tightly connected to the development of muscle strength".

Now, let's look at the method of combined flexibility and strength development. In case of applying this method, one should pay attention to stretching muscles and ligaments, when strength exercises are performed, and consider possible negative effect on flexibility. To avoid this effect, one should use following methodological techniques: consistently use strength and flexibility exercises [1]:

- direct sequence – "strength + flexibility";
- reverse sequence – "flexibility + strength".

The reverse sequence is more convenient if one needs to perform strength exercises with the maximum movement amplitude. In this case, however, one needs to understand that strength capabilities will decrease [1].

In terms of the direct sequence, due to the fact that strength exercises are also present, the joint mobility will decrease approximately by 18-25%. After a set of stretching exercises, flexibility will increase by 55-75%.

With the method of alternate application of strength and flexibility exercises for, i.e. flexibility + strength + flexibility + ... (during one training session), there is a step-shaped change in the mobility of the links of the body that are engaged. Flexibility begins to decrease each time after performing a strength exercise, but immediately after stretching, flexibility increases with a general tendency, and by the end of the training – to 30-35% of the initial level [1].

Therefore, an appropriate result of frequency development will be achieved if the work-up that includes static exercises for stretching is applied.

The purpose of this study was to experimentally substantiate the effectiveness of using the method of combined flexibility and strength development, aimed at developing flexibility in children aged 7-8 years engaged in rhythmic gymnastics.

As a hypothesis, we have suggested that using the method of combined flexibility and strength development during training for 7-8 years old gymnasts would have a positive effect on flexibility development.

Methods and organization. We have used following methods: analysis of scientific and methodological literature, pedagogical experiment, math-and-stats methods, pedagogical observation and control tests.

The study included three stages (from August 2021 to January 2022).

The first stage (August-September 2021) included analysis of specific literature, definition of purpose, tasks, object and subject of research, hypothesis, selection of diagnostic material. We have defined exercises in the rhythmic gymnastics program and constructed a set of exercises for developing flexibility, selected control exercises (tests) for identifying a level of flexibility in students: "Inlocation" (cm), "Mobility in knee joints" (cm), "Cross split" (cm), "Forward lean" (cm), "Bridge" (cm), "Arching" (cm) [2, P. 278]. In the "NEW STARTS" Sports Training Center, located in Petrozavodsk, we have selected two groups 10 people each for the control (CG) and experimental groups (EG) [7].

The second stage (September-December 2021) included first testing on both groups. The sessions were held three times a week for 90 minutes according to the experiment program. Girls from the experimental group performed a set of exercises according to the method of combined flexibility and strength development. Sessions for the control group were based on a traditional method. During the study, based on methodological learning guides by Karpenko L.A. and Lisitskaya T.V. [4-5], we have created sets of exercises for classes with the experimental group. This stage also included repeated (final) testing.

The third stage (January 2022) included data processing, analysis and comparison of the obtained results, conclusions were made based on the results of the study, the effectiveness of using the method of combined flexibility and strength development in rhythmic gymnastics classes for children aged 7-8 years was identified; the results of the study were formalized.

The data were processed using Excel tables. We have also calculated significance of differences between two groups of results with the Student test.

Results and discussion. The training for girls of both groups used exercises for developing joint mobility and spine flexibility. On the same sessions, the EG had special sets of physical exercises.

Table 1 presents sets of exercises according to the method of combined flexibility and strength development, which were used for the EG.

According to the experiment results, the indicators have improved in all exercises (tests). Table 2 presents the indicators of flexibility development in the control (CG) and experimental groups in the course of the experiment.

Table 1

Sets of exercises with weights (for the experimental group

Set of exercises №1 Dynamic exercises for developing flexibility with leg weights (to 100 g)	Set of exercises №2 Exercises on wall bars with special rubber bands on legs	Set of exercises №3 Exercises for developing flexibility in knee and hip joints with leg weights (to 100 g)
1. Demi-pointe walking, with inlocation	1. Face the wall and alternate "releve" and "releve with plie", repeat 4 times	1. Demi-pointe walking 2. Walking with forward swings

Table 1 (continued)

2. Uphill walk, with inlocation 3. Walking on the outside on the foot 4. Walking on the inside on the foot 5. Walking with forward swings and grasps 6. Walking with swings and grasps to the side 7. Walking with swings and the position of body arched touching the head with one leg 8. Bridge walks 9. The "Devil fish" ("Karakatitsa") run 10. Alternation of stomach rolls and front handsprings with elbows on knees 11. Alternation of cartwheels with hands, with elbows on knees, with chest on knees 12. Demi-pointe walking, with inlocation 13. Uphill walk, with inlocation 14. Splits: on the right, left leg, a cross split on gymnastic benches. Time for performance of the exercises – 3 minute for each split	2. Face the wall: 1 – "releve", 2 – bend knees, 3 – kneel down, heels are raised high, 4-5 – hold the position, press on the half-toes, 6-7 – get up from the floor, 8 – lower the heels down, repeat 4 times. 3. Like the second exercise, but uphill 4. Face the wall, legs apart, right hand on the rail, left raised. 1-3 – lean forward with touching the floor, 4 – rise up and change the hand, 5-8 – repeat with right hand. 5. Stand with one back to the wall, legs together, grab the rail near the hips, press the chest to the knees, repeat 8 times 6. Stand with your back to the wall, legs together, bent at the knees, hands hold the rail with a grip from above, 1-2 – stretch your arms, stand in the bridge, with your hands as if walking down, stretch your knees, 3-4 – hold the bridge, 5-8 – go back up, repeat 6 times 7. Face the wall, sit on the floor, legs apart, put your feet on 1 rail and hold 1 rail with hands, 1-4 – lean forward and touch the floor with your chest, 5-8 – return. Repeat 6 times 8. Stand with left side to the support, bend right leg at the knee and put it on the demi-pointe in front, and shift the center of gravity to the right leg, raise right hand up 1-4 – bend backwards, grasp the leg, 5-6 – keep this position, 7-8 – return to the	3. Walking with backward swings 4. Walking with lunges 5. Walking with bending forward and backwards 6. Bridge walks 7. Walking with toe touch bending 8. Handsprings sideways with elbows 9. Turning on the side in a split 10. Handsprints from the main position, then make a cross split, legs apart (spread straight legs in one line) and then return to the main position 11. Splits: on the right, left leg, a cross split on gymnastic benches. Time for performance of the exercises – 3 minute for each

Table 1 (continued)

	initial position. Repeat 4 times. Repeat with the left leg 9. Swings forward, to the side, backwards and into the position of body arched touching the head with one leg –10 times each with the rubber band 10. Face the wall, the left leg must be placed with the inside side close to the rail, the hands should be held on the wall. 1-4 – the right leg on the rail is stretched, fix in a split position, bend in the back and touch the head of the leg, 5-8 – return to the initial position. Repeat with the left leg. 11. Splits: on the right, left leg, a cross split on gymnastic benches. Time for performance of the exercises – 3 minute for each split	

Table 2

Flexibility indicators in the CG and EG at the beginning and the end of the experiment (M±σ)

Type of control exercises (test)	Control group (n=10)		Experimental group (n=10)	
	beginning of the experiment	end of the experiment	beginning of the experiment	end of the experiment
"Inlocation" (cm)	41.8±3.52	36.1±3.84	39.8±2.51	33.9±2.64
"Knee joint mobility" (cm)	4.6±2.63	5.5±2.54	4.3±2.66	6.4±1.95
"Forward lean" (cm)	8.1±3.41	10.8±2.89	8.0±5.39	12.5±4.08
"Bridge" (cm)	9.5±3.50	7.6±2.31	9.5±3.95	4.2±1.13
"Cross split" (cm)	10.2±6.21	7.8±6.79	10.2±6.62	4.6±4.52
"Arching" (cm)	7.8±5.11	5.3±2.35	8.7±4.94	4.4±0.96

Analysis of the results shows that before the experiments students of both groups had almost the same level of flexibility. The indicators are the same in the "Bridge" and "Cross split" exercises. There is an insignificant lag in the "Knee joint mobility" and "Forward lean" exercises, by 0.3 cm and 0.1 cm respectively. Girls from the EG had better initial indicators in the exercises "Inlocation" – by 1 cm, and "Arching" – by 1.1 cm.

At the end of the experiment, these is a positive dynamic in all indicators in both groups. At the age of 7-8, flexibility actively develops in children. Such exercises as the "Knee joint mobility", "Forward lean", "Cross split" have improved results. It must be kept in mind that at

the end of the experiment two girls from the control group sat in a split, the experimental group had much better results. This element is considered as one of the most complicated. The indicators have significantly increased in exercises that reflect the flexibility of the spine: "Forward lean", "Bridge", "Arching". However, not all students have improved their results in separate exercises. Five girls from the EG and six girls from the CG have demonstrated the same results as those in the initial test.

In total, the results obtained in both groups have significantly improved. In our opinion, the increase rate in the EG is connected to the purposeful impact of physical exercises with weights on flexibility. The suggested sets of exercises, performed according to the method of combined flexibility and strength development, had a positive effect on developing flexibility in 7-8 years old rhythmic gymnasts.

Conclusion. Therefore, considering the results of the conducted study, we would like to note that flexibility is a one of the leading physical qualities for rhythmic gymnasts. It is the foundation for learning the technique of separate and complicated gymnastic elements. The age of 7-8 years is a favorable period for developing flexibility, since it is advisable to include exercises with weights in addition to the generally accepted exercises for developing flexibility. It has been proven experimentally that inclusion of the exercises that are based on the method of combined strength and flexibility development contributes to an increase in the movement amplitude, joint mobility and comprehensive development of flexibility.

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For citation: Lomova O.A., Varina A.A. Methodological features of the flexibility development in 7-8 years old rhythmic gymnasts. *Russian Journal of Sports Science: Medicine, Physiology, Training*, 2022, vol. 1, no. 3. DOI: 10.51871/2782-6570_2022_01_03_8