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DEVELOPMENT METHODOLOGY OF ARTICULAR MOBILITY FOR 5-6 YEARS OLD GYMNASTS

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Keyword: *sport training, efficiency of methodology, special exercises and stretching, capacitate mobility, rhythmic gymnastics.*
Abstract. *The scientific problem solved in this article is the experimental argumentation of the sport training methodology on the mobility development of small gymnasts aged 5-6 years. In this regard, it was found that the rational use of gymnastics means to develop the gymnasts' mobility at their initial stage in rhythmic gymnastics.*

Actuality of the research theme. Contemporary sport is characterized by a rigorous dosing of the volume and intensity of physical effort and by an early specialization. Rhythmic gymnastics belongs to the category of sports in which these modern trends are highlighted [8]. For this reason, the practicing of rhythmic gymnastics begins at the age of four (pre-training group) [6, 10], the athletes are selected and engaged in an intensive training process, which contributes to the formation and improvement of motric skills, because at 5-6 years old they already participate in various national and international competitions.

The theoreticians, in a vast majority [1, 2] have determined that motric skills represent indispensable qualities for practicing sport. The specifics of rhythmic gymnastics movements also requires a good articular mobility [3, 4, 5]. In most cases, however, these qualities are manifested in rhythmic gymnastics in a combined form.

In recent years, due to the intensification of the fight on the international arena, the preparation for competitions of the sport-artistic composition has gained significant value. Due to the flexibility, plasticity, motric coordination and the ability to manipulate with virtuosity the portable objects in sports compositions, rhythmic gymnastics have a spectacular character, of great variety and beauty [6, 8, 9].

The development of mobility through the valorisation of the efficiency of the methodology used in rhythmic gymnastics represents a basic requirement in obtaining the sporting result. The fact that articular mobility is accomplished by some special exercises of stretch also leads to the formation of a long, elastic musculature, realising a good representation of neuromuscular control [5].

Most exercises in rhythmic gymnastics can not be performed correctly, ample and aesthetically without a good articular mobility and muscular elasticity. Valorisation of the efficiency of the articular mobility development methodology at this fragile age develops through special stretching and relaxation exercises (it has an increase in mobility by 12-15%), which also leads to obtaining of muscular elasticity. At the early stage of training, mobility exercises should be performed within a day (in combined forms), resting the muscular system, and then they shall be made every day, fact that involves the need for quality aspects of rhythmic gymnastics [6].

Hypothesis of the research. In research it was assumed that the application of an efficient methodology for the development of articular mobility, based on the specific elements, will ensure the improvement of the training level of the small gymnasts at the initial stage.

The purpose of the research constitutes perfecting and valorization on the efficiency of mobility development methodology at the early stage of rhythmic gymnastics training.

Objectives of the research:

1. Studying the theory and practice of sport training at the initial stage of training in rhythmic gymnastics.
2. Appreciation of the level of development of articular mobility of small gymnasts.
3. Experimental argumentation of the efficiency of the application of the mobility development methodology at the sport training of gymnasts of 5-6 years old at rhythmic gymnastics.

The reason of choosing the research problem consists in the fact that the small gymnasts practicing this sport test, in which the beauty of the plastic movements combines with the perfecting of the muscular elasticity, can not realize correct,

rigorously and aesthetically most of the exercises in the rhythmic gymnastics provided by the Code of score.

In order to realize the purpose and objectives of the paper, a pedagogical research was organized with the small 5-6 years old gymnasts from the Specialized Sports School of the Olympic Reserves, Chisinau city.

Table 1. Comparative analysis of the level of development of articular mobility of 5-6 years old gymnasts from the control and experimental groups (n = 16)

Nr.	Tested parameters	Group	Statistical data		T	P
			Initial testing	*Final testing*		
			$\overline{X} \pm m$	$\overline{X}$ m		
1	By sitting on the gymnastic bench, forward bending (cm)	M	9,37 ± 0,71	10,37 ± 0,62	2,403	<0,05
		E	9,50 ± 0,73	12,19 ± 0,55	6,245	<0,001
		T	0,12	2,18	-	-
		P	>0,05	<0,05	-	-
2	Twisting the arms back with gymnastic baton (cm)	M	33,25 ± 0,88	32,50 ± 0,87	1,396	>0,05
		E	33,37 ± 0,86	30,12 ± 0,44	5,711	<0,001
		t	0,10	2,44	-	-
		P	>0,05	<0,05	-	-
3	By dorsal lying, the bridge (cm)	M	25,25 ± 0,79	24,14 ± 0,64	2,388	<0,05
		E	25,37 ± 0,78	22,37 ± 0,46	6,176	<0,001
		t	0,11	2,23	-	-
		P	>0,05	<0,05	-	-
4	Forward string with the right (cm)	M	24,12 ± 0,89	22,87 ± 0,79	2,370	<0,05
		E	24,19 ± 0,90	20,81 ± 0,52	5,935	<0,001
		t	0,05	2,19	-	-
		P	>0,05	<0,05	-	-
5	Forward string with the left (cm)	M	26,50 ± 0,94	25,96 ± 0,91	0,942	>0,05
		E	26,75 ± 0,96	23,75 ± 0,88	5,258	<0,01
		t	0,19	1,75	-	-
		P	>0,05	>0,05	-	-
6	Lateral string with the right (cm)	M	27,87 ± 0,77	26,75 ± 0,73	2,444	<0,05
		E	28,00 ± 0,76	24,96 ± 0,39	6,153	<0,001
		t	0,12	2,16	-	-
		P	>0,05	<0,05	-	-
7	Lateral string with the left (cm)	M	28,62 ± 0,80	27,87 ± 0,77	1,554	>0,05
		E	28,75 ± 0,79	25,91 ± 0,50	5,824	<0,001
		t	0,11	2,15	-	-
		P	>0,05	<0,05	-	-
8	Dorsal lying, right foot forward (cm)	M	65,62 ± 0,75	64,56 ± 0,58	2,400	<0,05
		E	65,75 ± 0,75	62,94 ± 0,45	6,019	<0,001
		t	0,12	2,22	-	-
		P	>0,05	<0,05	-	-
9	Dorsal lying, left foot forward (cm)	M	67,00 ± 0,80	66,75 ± 0,75	0,521	>0,05
		E	67,12 ± 0,78	64,52 ± 0,68	5,610	<0,001
		t	0,11	2,20	-	-
		P	>0,05	<0,05	-	-

Note: (f=14) Conjugate samples (f=7) Conjugate samples
M = 8; r = 0,811 P – 0,05; 0,01; 0,001 P – 0,05; 0,01; 0,001
E = 8; 2r = 1,622 2,145; 2,977; 4,140 2,365; 3,499; 5,408

Methods used in the pedagogical research. The following research methods were used to realize the objectives: the theoretical analysis and the generalization of the literature data; studying and generalizing documents on planning, evidence and control in sport training; pedagogical observation; method of tests; graphical and tabular method; pedagogical experiment; the statistical and mathematical method of processing and interpreting recorded data.

Findings and the obtained results.

The initial and final results of the mobility indicators in the control and experimental groups are presented in Table 1 (n = 16).

Regarding the sample by stting on the gymnastic bench, forward bending, the final average of the obtained results by gymnasts from the experimental group constitutes - 12.19 cm, the indicator is higher than the average obtained by the gymnasts from the control group (10.37 cm). Media of the final results obtained by the gymnasts from the experimental and control groups showed a significant difference to the 5% threshold (t = 2,176; P <0,05).

In order to highlight the means used in the development of the muscular elasticity of the lower limbs, exercises were used exercises from the sitting position, forward bending with grasping of the ankles, from the sitting position forward bending with the spikes stretched towards itself with the twist of the leg in the first choreographic position, support bent on the vertices with the simultaneous bending of one leg back. These means, used during the training process, contribute to the fortifying of the organism and the perfecting of a correct, harmonious children's posture.

At the sample of twist of the arms with the gym baton, the athletes of the experimental group present a final average value of 30.12 cm, less than the initial average of 33.37 cm, resulting in a difference of 3.25 cm. The "t" variable for the final tests of the two groups in this sample, demonstrates that values above the significance threshold (t = 2.44, P <0.05) were recorded.

The substitution of some exercises with various helpful means has beneficial influenced on the development of scapulo-humeral mobility of 5-6 years old gymnasts from the experimental group. Thus: closing and opening the fists for finger mobility; repeated movements of extension of the arms with increased amplitude, on different directions; movements of balance, in the arc, circle and in the eight, from the fist, elbow and shoulder articulation; lowering the arms back - forward with the gymnastyc rope.

A good mobility of the arms articulations is reflected upon the formation of a correct and beautiful posture at the initiation stage, as well as of the correct execution of all exercises related to articular mobility.

With regard to sample from dorsal lying (Table 1), the experimental group recorded an average arithmetic value of 25.38 cm and the control group – of 25.25 cm at initial testing. The variable "t" indicates an increase of results at the muscle-tendon elasticity, between the initial and final tests (6,176) in the experimental group, the difference being significant (P <0.001). The control group, also, indicates a significant increase between the initial and the final tests, where t = 2,388 (P <0,05), the variable "t" for the final tests of the two groups demonstrates that have been registered values over the significance threshold t = 2.23, P & lt; 0.05).

The spine has a metameric structure and consists of separate bone segments - vertebrae, which consistently overlap one over other. When performing the bridge, the vertebrae are moving away until the stretch line of intervertebral cartilage and longitudinal ligaments that pass the anterior and posterior to the median line. When performing the bridge are changing not only the positions of the vertebrae, but also of the entire bone system in all the articulations.

The development of mobility depends on the length and elasticity of articulations and muscles ties; the functional state of brain centers, regulators and muscle tone.

The level of application of stretching exercises, at this age, reached significant progress in the experimental group, due to the algorithmic method of training, which included specific exercises of rhythmic gymnastics, such as: extensions and forward and lateral bendings from different standing, sitting or lying positions; turns, inclinations of the trunk from different positions; trunk waves - wavy movements, realized at the level of the spine by standing, standing distanced, standing on the knees etc.

The value calculated to the parameters for

string forward and lateral with the right/left, dorsal lying with the right/left forward is significant towards the initial testing, in the experimental group, with the probability of 99-99.9%.

Any motric movement, especially the string, leads to a displacement of the skeletal system, ligaments and articulations, any form of muscular activity results in the excitement of the proprioceptors in the muscles, tendons, ligaments and articular surfaces. Therefore, the following means of development of mobility have been used: relaxation exercises and muscle tightness; slow movements with amplitude according to the possibility; repetition of elastic movements, passive movements. The development methods were the following: of repeat, with the help of the partner and of game.

To achieve the desired exigencies to the samples of maintaining of the right / left in all directions, simple or compound rocking with balance were used increasing amplitude gradually (grand battement); ample balances from a lying down position; inclinations from a sitting position more distant, bendings in different directions, from a facial lying position the legs more distant in string or with folded legs as a "frog"; lunges in all directions etc.

In order to realise the proposed goal, it is necessary to optimal heating of the musculature, on which a gradual action of the intensity, stretches, in order not to contravene the anatomic potential.

Conclusions and recommendations:

As a result of the analysis and synthesis of fundamental theoretical-methodological research regarding the valorisation of efficiency of development of the mobility, at the initial stage of sports training in rhythmic gymnastics, it can be found that the methodology of organizing and conducting of this process is at the beginning of way and it is not sufficiently studied. At the same time, we have to mention that the calculated value of the 9 tested parameters, in the experimental group, is significant compared to the final testing with a probability of 99-99,9%.

The obtained data confirm the efficiency of the methodology used during the training process of the small gymnasts, at the initial stage of training in rhythmic gymnastics.

The content of the sports training should be complemented by special exercises for development of mobility. Efficiency, in this regard, is great if the process starts at an early age, because through the repeated muscle contractions, without compensatory stretching exercises, the muscle gains strength but loses its elasticity.

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