

Contributions related to optimizing mobility indices in gymnasts by means of aerobic gymnastics

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Abstract

The aim. The purpose of this research is the formation of gymnasts with good general and special physical training, apt to meet the competitive requirements at national level, currently and in perspective. We consider that the introduction of operational means specific aerobic gymnastics designed for the increase in indices mobility will result in an increase in. **Methodology.** At the start of the experiment, we conducted a series of tests on girls who want to become gymnasts.. Due to the fact that the athletes subject to the experiment are aged between 7 and 9 years, most of them having 8 years, the appreciation of motor quality mobility is only through 2 samples, and for speed we chose the rehearsal speed. After these requirements, the two tests specific to articular mobility will be carried out: a) test 1 mobility in lumbar spine: top bridge; b) test 2 mobility in coxo-femoral joint: lateral string; c) test 3 repetitive speed: the rigle method. Through these samples, the degree of lumbar and coxo-femoral mobility was tested. **Results.** For lumbar mobility, the top bridge, relevant progress has been made. The coefficient of variability was in both tests between 0-10%, which means high homogeneity and low dispersion, ie C.V.i =5.46% and C.V.f= 6.8% with a decrease of 1.3% of homogeneity at the final test. For the mobility of coxco-femoral joint, lateral string, significant progress has been made. The coefficient of variability was between 4.09% and 4.60%, which shows us that the homogeneity of the group is large C.V.i. = 22.5% and C.V.f. = 42.5%. For the repetition speed, the homogeneity of the group is high both in the initial test and the final test, the group losing homogeneity in the final test. At this test C.V.i. = 2.83%, and

C.V.f. = 3.92% dispersion being very small. **Conclusions.** Following the analysis and interpretation of the statistics indicators presented in the tables and studying the initial and final data presented, the main statistical indicators were discussed: average deviation, standard deviation and variability coefficient.

Keywords: aerobics, motor skills, training, motor features, somatic features

Introduction

“Aerobics” comes from the Greek word “Aerovichi” meaning oxygen gymnastics “or, more precisely, oxygenation of the body to maximum effort. Adordance “aerobics means a living organism that lives only when it consumes oxygen representing, in this way, all processes that take place through the participation of oxygen.

“Aerobic gymnastics is a sporting physical activity, with multiple positive valences with the main reference element, the motor and mental capacity of the individual, with beneficial effects on physical condition and health”(Kulcsar, 2000).

“Compared to the modern evolution of the sports natrenamet, an improvement is imperative, leading to the improvement of the methodology applied judically through the perspective of each component of the training”(Stoenescu, 2000). Aerobic gymnastics is a maintenance gymnastics that is an integral part of the aerobic exercise system and performing with musical accompaniment. In this system, it is particularly incorporating the sports disciplines with cyclic movements (repeat movements) such as: walking, running, cycling, swimming, etc.

“Aerobic training has the systematic, rhythmic oxygenation of the athlete for solving energy metabolism in intensity training: small, medium or large”(Kulcsar, 2000).

Mobility is defined differently in the literature. Thus, the Explanatory Dictionary of the Romanian Language (www.dexonline.ro), considers that the term has the following valences: “the acquisition of being mobile, to change its place”; The property to be moved, moved change, transformation, variability “Human’s

ability to change its expression”, the second valence expresses the particularity of the notion in domain terminology”(Alexe, 1993), defines mobility as “man’s ability to maximize the anatomical locomotor potential in a particular joint or in the body joints, materialized by carrying out great amplitude movements”. This definition highlights the link between the anatomical structure (joint) and the amplitude of the movement. Mobility / suppleness and coordinating skills with two forms of manifestation: static and dynamic, each of which is generally in appearance, active and passive”(Rață, 2006).

The suppleness is defined by several authors, starting in 1978, J.M.of Chevalier quoted by Rață, of the musculo-articular mechanisms which, within the limits of heritability and under the influences of the activity, offer the movement of the locomotor segment”.

In the process of developing mobility it is recommended to use all types of exercises presented because each of them acts in certain directions. For the development of mobility, it is recommended to comply with the following methods and methodical indications:

- “exercises for mobility development will be selected according to the requirements of each sports branch or basic and applicative driving skills and the level of preparation of the executors”(Piscoi, 2009).
- search for special exercises for mobility, but also of the highest amplitude technique.
- parallel to mobility exercises, it is recommended to use force exercises.
- before conducting mobility exercises, a good heating of the locomotor (until the occurrence of perspiration) is required and, in particular, the joints on which it will act in that lesson.
- mobility exercises are performed in the first part of the lesson, at heating
- (stretching) or between resistance or strength exercises, and as the lesson, after heating or after the themes or objectives of the lesson.
- it is advisable to avoid working for the development of mobility when the body is tired after strengths and strength,

because exercises no longer have the desired efficiency” (Piscoi, 2009).

Somatic and functional features

During the “growth and development, the various tangible elements show differentiations from one age to another, so it is necessary to specify that there are some discrepancies between chronological and biological age. For these reasons, a series of investigations are made for the establishment of the biological age, the only one to allow the efficient individualization of sports training” (Alexe, 1993).

“Muscle strength is relatively low, and maintaining balance requires additional effort” (Dragnea, 1999). At 7 years there are several processes involved in growth and development. After 7 years, ossification in the basin in the girls is intense, as well as the calcification processes in the handhand. “The joints are also strengthened. Increases the volume of muscles. The fine muscles of the hand develop” (Șchiopu, 1981).

“Influenced by the integration into the school environment with wide psychic resonances, personality, emotional, student is subject to increased demands, felt differently according to its biological development” (Dragnea, 1991).

Curiosity of children is very vivid, their attention being maintained more time in interesting activities. “Among the mental peculiarities of the small school age, attention is particularly attracted to intellectuals that condition the educational process and at the same time determined. Children are attracted by the dynamics and the external attributes of objects. Game or Construction activities keep more time focused, but they also produce fatigue” (Epuran, 2005).

Regarding the particular speed education peculiarities at this age, various games and exercises are used, such as: races on numbers, rapid changes in signal positions, signal turns, etc. “Given that in this sporting branch, the execution speed is expressed by the rhythm of execution imposed by the specificity of the discipline, namely the rhythm of the chosen musical movements, is the one with a great share in the execution of the movements, the

speed exercises will Axis mainly on educating this form of manifestation, which is made without difficulty or even in relieved conditions”(Stroescu, 1968). **Increasing the level of difficulty**, requirements for choreography of competition exercises, requires a rigorous approach to increasing the value of mobility, coordination and balance of athletes. “All training programs should include the fundamental factors of sports training, namely: physical, technical, tactical, artistic, biological and theoretical. These are an essential part of any training program, regardless of the age of the athlete, the individual potential, level or preparation phase”(Bompa, 2001).

Methodology

At the start of the experiment, we conducted a series of tests on girls who want to become gymnasts. The children’s testing took place at the Gymteam Sports Club in Arad, under the club has a gym with a good equipment. The experiment was carried out during the year 2021-2022, between November 1, 2021 and April 15, 2022. For experimental research, we chose a sample consisting of 16 athletes between 7 and 9 years old.

The purpose of this research is the formation of gymnasts with good general and special physical training, apt to meet the competitive requirements at national level, currently and in perspective. We consider that the introduction of operational means specific aerobic gymnastics designed for the increase in indices mobility will result in an increase in. These tests consisted of initial measurements to follow the stage from which we started, and at the end of the experiment, to achieve the final measurements. Due to the fact that the athletes subject to the experiment are aged between 7 and 9, most of them having 8 years, the appreciation of motor quality mobility is only through 3 samples, and for speed we chose the speed of repetitive. After completing these requirements, the three tests specific to articular mobility will be carried out: a) test 1 mobility in the lumbar spine articulation: the top bridge; b) test 2 mobility in coxo-femoral articulation: lateral string;c) test 4 repeat speed rgle

method. Through these samples, the degree of lumbar and coxo-femoral mobility was tested.

Means and methods used in the experiment, which was used to improve joint mobility:

Nr. crt.	Name of the exercise	Number of reps	Number of series
1.	Right -leg swinging, stretched out of dorsal bed with outstretched arms	20x	1
2.	Left -foot swings, stretched out of dorsal bed with outstretched arms	20x	1
3.	Swing with legs stretched and open in side string, from the dorsal lying with outstretched arms and crossed fingers	20x	1
4.	The bottom bridge	10x	1
5.	The top bridge	10x	1
6.	String forward with the right leg to the bench	1x	2
7.	String forward with the left foot at the bench	1x	2
8.	Side string with the right leg on the bench	1x	2
9.	Side string with left foot on the bench	1x	2
10.	Package in close to the heels on the bench and benches on the bench next to the legs	1x	2
11.	Package in the distance with heels on the bench and bracelets on the bench between the legs	1x	2
12.	State on the tip turned down with palms on the ground	1x	2
13.	State on the knees with a partner	1x	1
14.	Balancing to the spine with the right foot forward	8x	2

15.	Balancing to the spine with the left foot forward	8x	2
16.	Balancing to the spine with the right foot	8x	2
17.	Balancing to the spine with the left foot	8x	2
18.	Swinging back with the right leg stretched	8x	2
19.	Swinging back with the right leg bent to the head	8x	2
20.	Swinging back with the left leg stretched	8x	2
21.	Swing back with left foot to the head	8x	2
22.	Swings on the line: forward, side and back with left and right foot	2x	2
23.	Walking in the bridge	1 soil length	2
24.	Walk on the tip turned out of the feet	1 soil length	2

Results Obtained

For lumbar mobility, the top bridge, relevant progress has been made. The coefficient of variability was in both tests between 0-10%, which means high homogeneity and low dispersion, ie C.V.i=5.46% and C.V.f= 6.8% with a decrease of 1.3% of homogeneity at the final test. For the mobility of coxco-femoral joint, lateral string, significant progress has been made. The coefficient of variability was between 4.09% and 4.60%, which shows us that the homogeneity of the group is large C.V.i. = 22.5% and C.V.f. = 42.5%. For the repetition speed, the homogeneity of the group is high both in the initial test and the final test, the group losing homogeneity in the final test. At this test C.V.i. = 2.83%, and C.V.f. = 3.92% dispersion being very small.

In order to interpret data properly and following the application of the experiment, we have done a simple and as much as possible tabular centralization.

By comparing the results obtained from the initial tests with the final ones, there is an improvement in the indices that reveal it.

Table no.1. Test values made in experimental research – T.I and T.F

Nr crt.	Name and surname	The top bridge		The lateral string		Repeat Speed	
		Ti	Tf	Ti	Tf	Ti	Tf
1.	M.P.	29	26	37	34	23	22
2.	A.D.	30	26	36	33	24	22
3.	A.A.	26	24	35	32	24	23
4.	A.F.	26	24	35	32	23	22
5.	M.B.	27	23	34	31	25	24
6.	M.M.	30	27	38	35	25	25
7.	A.S.	27	22	37	34	24	23
8.	A.D.	27	23	39	36	24	24
9.	M.G.	30	27	37	34	24	24
10.	A.R.	28	25	39	36	23	23
11.	G.S.	31	28	38	35	23	24
12.	C.L.	27	23	36	33	24	24
13.	C.T.	27	23	36	33	24	24
14.	N.E.	29	25	35	32	24	24
15.	M.M.	26	24	35	32	23	22
16.	N.P.	26	23	37	34	23	23
	X	27.875	24.5625	36.5	33.5	23.75	23.3125
	S	1.7078251	1.7876894	1.505545	1.505545	0.68	0.94648
	C.V.(%)	6.1267269	7.2781247	4.124782	4.494165	2.87634	4.05999

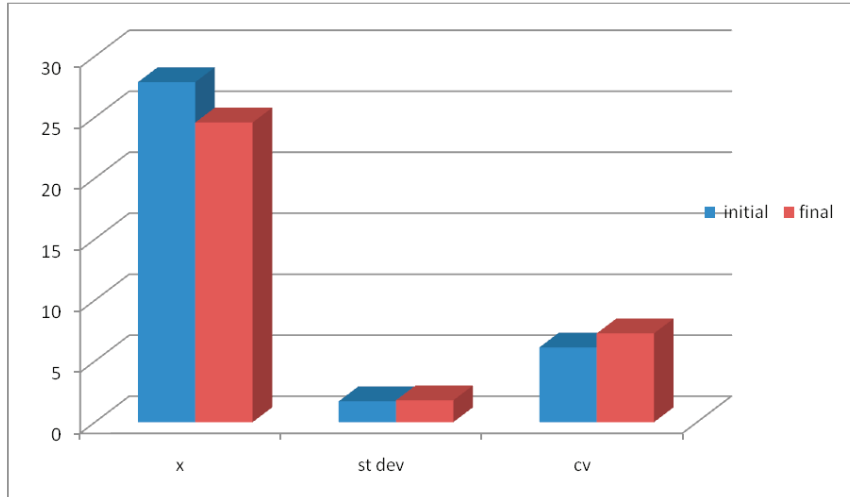


Chart no 1. Graphic interpretation of statistical indicators for lumbar mobility - top bridge

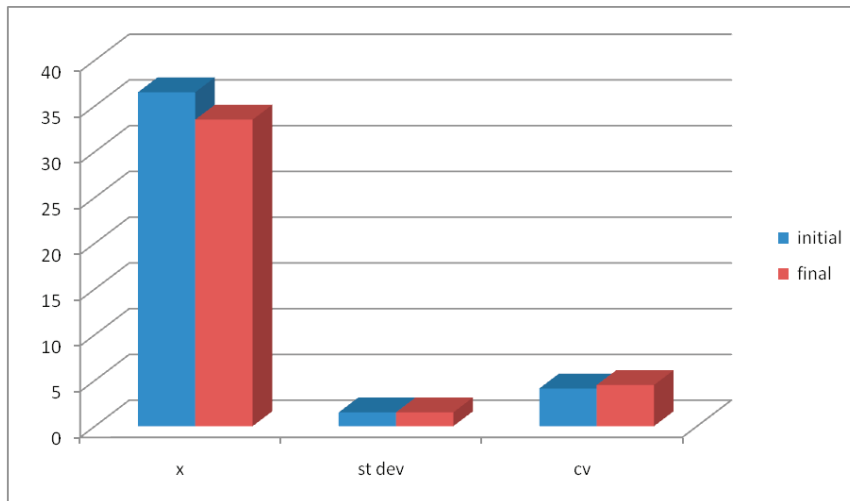


Chart no 2. Graphic interpretation of statistical indicators for coxo-femoral articulation (string lateral)

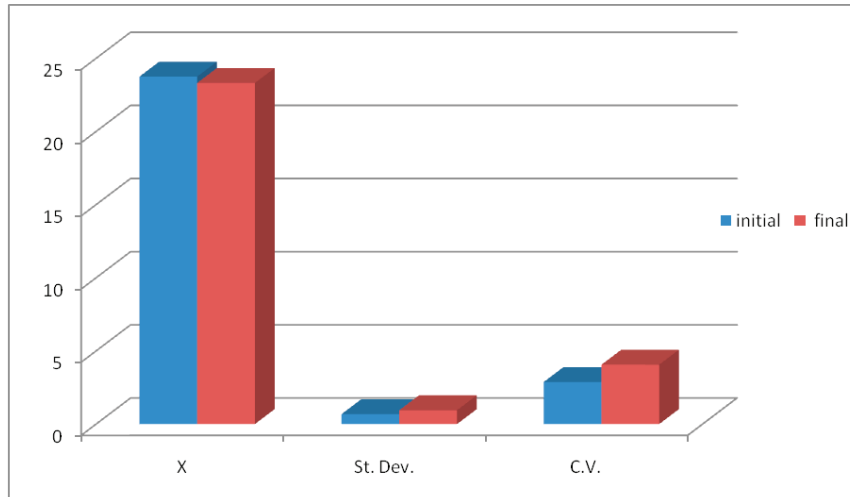


Chart No. 3. The graphical interpretation of the values of the statistics indicators for the speed of repetition

Conclusions

Following the analysis and interpretation of the statistics indicators presented in the tables and studying the initial and final data presented, the main statistical indicators were discussed: average deviation, standard deviation and variability coefficient.

According to these three indicators, the calculations have highlighted significant integral and final tests.

Regarding the statistical indicator for lumbar mobility, respectively the top bridge, relevant progress has been made. Taking into account the average deviation, has emerged in the final test a significant progress. The coefficient of variability was in both tests between 0-10%, which means a high homogeneity and a low dispersion, namely $C.V.i = 5.46\%$ and $C.V.f = 6.8\%$ with a decrease of 1.3% of homogeneity in the final test.

In the case of sample for coxco-femoral joint (s) significant progress has been made. The coefficient of variability was between

4.09% and 4.60%, which shows us that the homogeneity of the group is large $C.V.i. = 22.5\%$ and $c.v.f. = 42.5\%$.

Regarding the statistical indicator of the repetition, the progress is small. Only a few sports are highlighted that have achieved more relevant results. In the case of other progress, it is less obvious, as this quality is less perfection. The homogeneity of the group is high both in the initial test and the final test, the group losing homogeneity in the final test. At this test $C.V.i. = 2.83\%$, and $C.V.f. = 3.92\%$ dispersion being very small.

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