IMPROVEMENT OF THE INITIAL TECHNICAL TRAINING CONTENTS IN WOMEN'S ARTISTIC GYMNASTICS

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Abstract

Premises. The main goal of the training in the artistic gymnastics is the improvement of all possibilities of the body in order to achieve the performance, the high performance at the events held on dates fixed beforehand. To this effect, we have considered that an optimum relation of the general physical training and the technical training, reached through the selection of the most efficient specific means, will contribute to the improvement of the technical knowledge of the girls beginner gymnasts.

Methods of research. We decided to organize a study within the Sports Club during a period of 8 months, from October 2008 to May 2009. The subjects of the study were a group of 7 girls beginner gymnasts selected out of the whole training group. In order to find out the level of the gymnasts' training, evaluation tests of anthropometrical measurements and control trials were applied, in order to assess the muscular strength and joints mobility physical training and the technical training at apparatus: acrobatics, uneven parallel bars, balance beam and supported vaults. During the study, the method of observation was used: the gymnasts' evolution all along the training period was closely watched and the results obtained were processed and interpreted by means of the statistical-mathematical and graphical representation methods. For a more efficient contents of the beginner gymnasts' initial technical training, a training program was elaborated, which points out the contents of the means used within the artistic, technical and physical training.

Results. The results of the study emphasize the following practical-methodical aspects that are the basis of the technical training contents improvement at beginner gymnasts' level:

- the results of the somatic development prove a significant evolution of the anthropometrical measurements data with a poorer homogeneity as for the weight;

- the results of the physical training show significant differences of the control trials average scores and a good homogeneity at both tests;

- the results of the initial technical training point out significant differences at all apparatus, with a good homogeneity at both tests and a close connection to the physical training level of these ones.

Conclusions. Following up the conducted research we can confirm the following aspects:

- an optimum physical training of the girls beginner gymnasts influences on the efficiency of the technical elements needed to the initiation at each apparatus;

- the utilization of the physical training programs for each stage of the training improves the contents of the technical training;

- the assurance of an optimum relation between the general physical training and the technical training leads to the improvement of the technical resources of the girls beginner gymnasts.

Key words: gymnastics, artistic training, physical training, technical training.

Preamble

At the present moment, the artistic gymnastics reached a really high level so that the Code of Points modifications can no more be done, as it usually have happened after each one of the Olympic Games.

The artistic gymnastics is considered a limit- sport for the physical and psychical possibilities of its practicing athletes. By watching the large contests (World and European championships, Olympic Games), it can be noticed the very high level of gymnasts' training, this one entailing the more difficult selection of the best female gymnast (Grigore, V., 2001).As the specialists have stated and the experience has showed, a systematic training in gymnastics can be started from 5 to 6 years old. Thus it is emphasized the orientation towards a better basic training (a general one and a training for each apparatus separately), taking into account the technical contents extremely rich and various, the multitude of qualities needed to the assimilation of these movements, the multitude of the problems related to the development of the future competitive female gymnasts, strong individual personalities (Vieru, N., 1997).

The main target of the training in artistic gymnastics is the improvement of all possibilities of the organism in order to achieve performances and high performances during the events held on dates determined beforehand (Potop V., 2008). The goal of the work is to demonstrate that by providing an optimum relation of the physical, choreographic and technical training, the beginner female gymnasts' initial training contents will be improved.

Hypotheses of the Work

- An optimum level of the beginner gymnasts' physical training will influence upon the efficient learning of the technical elements needed to the initiation at each apparatus.

- The use of the physical training programs for each preparatory stage will lead to the improvement of the technical training contents.

An optimum relation of the general physical training and the technical training, ensured by the selection of the most efficient means, will improve the technical knowledge of the beginner female gymnasts.

Place, subjects, duration

The Gymnastics Department of the School Sports Club no.2 of Bucharest.

The study was carried out along a 8 months period, from October 2008 to May 2009.

The subjects of the study were a group of 7 beginner female gymnasts selected out of the whole group.

Stages of the study carrying out:

- Initial stage, 1- 12.IX.2008, initial testing of the trials and assessment of the technical elements learning at apparatus.
- Fundamental stage, October 2008 – April 2009, application of the technical and physical training programs.
- Final stage, 1-12.V.2009, final testing of the trials, assessment of the technical elements learning at apparatus.

Research methods

- Bibliographic study method,
- Experimental method;
- Observation method;
- Statistical method and graphical representation method.

Applied trials and measurements

I. Somatic development: Height (cm); Weight (kg); thoracic perimeter: inspiration, expiration and thoracic amplitude (cm).

II. Physical training assessed by trials, related to the muscular strength and joints mobility:

- Abdominal strength: stretched legs raise at 90° on the rib stall;
- Back strength: stretched legs raise from prone position on the gymnastics box
- Arms strength: arms bending and stretching (push-ups); hang with elbows bent, chin over bar at uneven parallel bars / high bar
- Legs strength: genuflection with jump, simultaneously with forward arms raising up.
- Strength of scapulo-humeral joint, back and abdomen: prone support, holding the position.
- Mobility of the vertebral column*:* pushing into a bridge.
- Coxo-femoral mobility: forward split(right leg and left leg) and side split.
- Sense of balance– tiptoe walk on the beam, arms stretched laterally, dismount by deep stretched jump on a mat.

III. Technical training

1. Acrobatic training*:*
- *Forward-backward crouched roll on.*
- *Forward-backward roll on with legs astride.*
2. Training on beam*:*
- Forward walk on beam with leg balance; arms stretched laterally.
3. Training at uneven parallel bars

- Lateral motion on the lower bar from left to right and vice versa.

4. Training for vaults
- *For landing:* deep jump from the vaults table.
- *For jumping on the springboard* - 2-3 running steps, jump onto the springboard and vertical fly.

Contents of the training means

I. Artistic training
- walk; arched, acute and high running;
- gallop step;
- polka step;
- high step;
- forward, backward changed step;
- stretched somersault with 360° turning round;
- closed – open somersault;
- scissors jump;
- cat jump;
- sissonne jump;
- exercises at the wall horizontal bar, positions.

II. Floor (acrobatic training)
- acrobatic games and relay races;
- forward-backward and side roll-overs;
- forward-backward roll over (in crouching position, stretched legs astride and closed);
- pushing into a bridge;
- forward, right and left split;
- side split;
- handstand, falling into bridge position and stand up;
- slow forward – backward roll over;
- side roll over (cartwheel);
- returned cartwheel.

III. Supported vaults
Landing school :
- deep vaults;
- variants of vaults with jump onto springboard, landing.
School for the springboard jump:
- straight jumps onto springboard;
- with 2-3 running steps, jump onto springboard;
- vaults with landing backwards on the mats.

IV. Beam
- balance tiptoe walk with and without turning at the beam extremity and at beam halfway;
- high step;
- walk with balance of one leg;
- assemble straight jump;
- assemble sissonne;
- forward tucked overturning;
- two legs mounting in crouching position;
- dismount by simple somersault,

V. Uneven parallel bars
- games for adaptation to the apparatus;
- different hangs and supported positions;
- assisted: from hang position, handstand forward turning over on the low bar;
- assisted: support on the low bar, backward swing, backward circle in supported position.

Results of the study

Table no.1. **Results of anthropometric measurements**

Statistical Indices	Height (cm)		Weight (kg)		Thoracic perimeter (cm)					
					Expiration		Inspiration		Thoracic amplitude	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
x	117	119.1	19.23	20.29	62.57	65.0	67.55	70.64	5.0	5.58
Am	4.0	3.84	2.29	2.10	2.49	2.36	2.86	2.33	0.47	0.55
s	4.66	4.42	2.45	2.30	2.87	2.66	3.17	2.64	0.69	0.59
Cv%	3.98	3.71	12.7	11.32	4.59	4.10	4.70	3.73	13.72	10.59
r	0.70		0.95		0.75		0.81		1.00	
t	2.19		6.76		2.54		3.12		23.59	

Table no.2. **Results of physical training**

Statist. Indices	Abdom. strength		Back strength		Arms str-pushups		Arms strgth-hold		Legs strength		Scap joint strngth	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
x	11.57	14.78	15.33	19.45	6.38	9.96	14.14	20.0	15.44	22.43	37.14	45.22
Am	1.92	2.02	1.93	1.69	0.75	1.26	1.88	2.18	2.27	2.78	4.45	4.86
s	2.26	2.25	2.16	1.83	1.00	1.61	2.23	2.30	2.59	3.33	5.41	6.0
Cv%	19.56	15.22	14.09	9.39	15.71	17.29	15.78	11.48	16.75	14.86	14.56	13.26
r	0.97		0.91		0.98		0.82		0.96		0.91	
t	9.47		4.93		11.67		3.22		7.23		7.23	

Table no.3. **Results of physical training** - continued

Statistical Indices	Spine mobility		Balance sense		Mobility-right split		Mobility-left split		Mobility-lat split	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
x	7.71	8.42	7.29	8.53	6.64	8.14	6.86	8.14	6.0	7.64
Am	0.44	0.55	0.61	0.58	0.46	0.33	0.33	0.33	0.07	0.46
S	0.55	0.59	0.70	0.70	0.48	0.47	0.47	0.47	0.27	0.48
Cv%	7.09	7.02	9.61	8.39	7.23	5.73	6.80	5.73	4.54	6.88
r	0.95		0.92		0.96		0.87		0.98	
t	6.55		5.24		7.23		3.87		11.67	

Table no.4. **Results of technical training - acrobatics**

Statistical Indices	Beam training (scoring)		Uneven parallel bars (scoring)		Vaults training (scoring)			
	Walk with forwards leg balance		Side travel on low bar		Vault from table - landing		Jump onto springboard	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
x	7.80	8.64	7.67	8.33	7.57	8.64	7.0	8.14
Am	0.32	0.46	0.44	0.58	0.49	0,46	0.57	0.24
s	0.40	0.48	0.47	0.70	0.49	0.48	0.76	0.34
Cv%	5.13	5.56	6.15	8.39	6.54	5.56	10.8	4.24
r	0.96		0.91		0.95		0.90	
t	7.23		4.93		6.55		4.75	
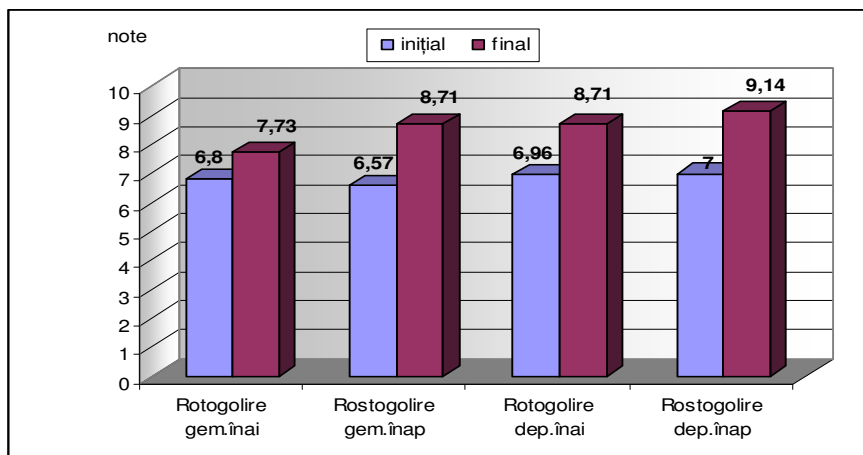
Graph no.1. **Acrobatics technical training**

Table no.5. **Results of technical training - apparatus**

Statistical Indices	Acrobatic training (scoring)							
	Forward crouch roll		Backward crouch roll		Forward roll astride		Backward roll astride	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
x	6.80	7.73	6.57	8.71	6.96	8.71	7.0	9.14
Am	0.64	0.40	0.49	0.61	0.17	0.44	0.0	0.33
s	0.75	0.45	0.49	0.70	0.36	0.55	0.0	0.47
Cv%	11.0	5.76	7.53	8.03	5.15	6.28	0.0	5.10
r	0.97		0.91		0.98		0.82	
t	9.47		4.93		11.67		3.22	
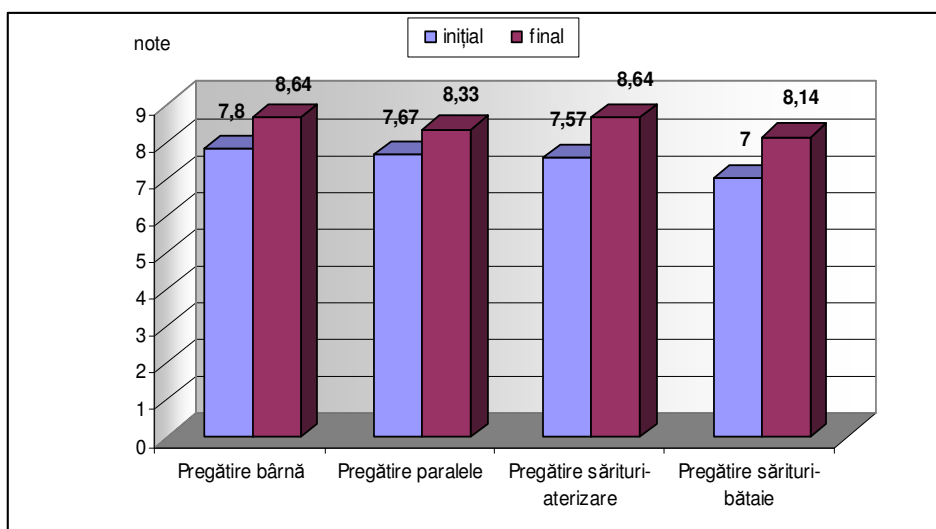
Graph no.2. Technical training at apparatus

Interpretation of study results

1. Interpretation of somatic development results (table no.1):

- Height – the value at the initial testing is 117 cm and an increase by 2.1 cm at the final testing and insignificant differences at p 0.05.
- Weight – the value at the initial testing is 19.23 kg with an increase by 1.06 kg at the final testing and significant differences at p-0.01.
- Thoracic perimeter - Expiration – the value at the initial testing is 62.57 cm and an increase by 2.43 cm at the final testing and insignificant differences at p-0.05.
- Thoracic perimeter - inspiration – the value at the initial testing is 67.55 cm and an increase by 3.09 cm at the final testing and significant differences p-0,05.
- Thoracic amplitude – it has values of 5.0 cm at the initial testing and an increase by 0.58 cm at the final testing with significant differences at p-0.01.

2. Interpretation of physical training results (tables no.2 and 3):

- Abdominal strength- at the initial testing it shows values of 11.57 reps and an increase by 3.21 reps at the final testing, with significant differences at p-0,01.
- Back strength – it shows values of 15.33 reps at the initial testing and an increase by 4.12 reps at the final test with significant differences at p-0.05.
- Arms strength – it has values of 6.38 reps at the initial testing and an increase by 3.58 reps at the final testing with significant differences at p-0.05.
- Arms strength – it has values of 14.14 seconds at the initial testing and an increase by 5.86 seconds at the final testing, with significant differences at p-0.05.
- Legs strength - it has values of 15.44 reps at the initial testing and an increase by 6.99 reps at the final testing, with significant differences at p-0.01.
- Strength of scapulo-humeral joint – it shows values of 37.14 seconds at the initial testing and an increase by 8.08 seconds at the final testing, with significant differences at p-0.01.
- Mobility of vertebral column – it shows values of 7.71 points at the initial testing and an increase by 0.71 points at the final testing, with significant differences at p-0.01.
- Sense of balance – the initial testing shows values of 7.29 points and an increase by 1.24 points at the final testing, with significant differences at p-0.01.
- Coxo-femoral mobility - it has values of 6.64 points at the initial testing and an increase by 1.5 points at the final testing, with significant differences at p-0.01.
- Coxo-femoral mobility - it has values of 6.64 points at the initial testing and an increase by 1.28 points at the final testing, with significant differences at p-0.01.
- Coxo-femoral mobility - it has values of 6.0 points at the initial testing and an increase by 1.64 points at the final testing, with significant differences at p-0.01.

3. Interpretation of technical training results

1. Acrobatics training (table no.4 and graph no.1):

- Forward crouch roll– it has values of 6.80 points at the initial testing and an increase by 0.93 points at the final testing, with significant differences at p-0,01.
- Backward crouch roll – it has values of 6,57 points at the initial testing and an increase by 2.14 points at the final testing, with significant differences at p-0.01.
- Forward roll legs astride – it has values of 6.96 points at the initial testing and an increase by 1.75 points at the final testing, with significant differences at p-0.01.
- Backward roll legs astride –the arithmetical mean has values of 7.00 points at the initial testing and an increase by 2.14 points at the final testing, with significant differences at p-0.05.

2. Beam training

- Forward walk with leg balance - the arithmetical mean has values of 7.80 points at the initial testing and an increase by 0.84 points at the final testing, with significant differences at p-0.01.

3. Training at uneven parallel bars

- Lateral travel on the low bar from left to right and vice versa - the arithmetical mean has values of 7.67 points at the initial testing and an increase of the arithmetical mean by 0.66 points at the final testing, with significant differences at p-0.01.

4. Vaults training

- Landing - the arithmetical mean has values of 7.57 points at the initial testing and an increase of the arithmetical mean by 1.07 points at the final testing, with significant differences at p-0.05.
- Jump onto springboard - the arithmetical mean has values of 7.0 points at the initial testing and an increase of the arithmetical mean by 1.14 points at the final testing, with significant differences at p-0.01.

Conclusions

The beginner female gymnasts' training is achieved by the influence of the general physical training means, the initial technical training with the stress laid on the acrobatic and choreographic training, on the exercises from hang and support position and on direct or turned vaults.

Following up the conducted study it was found out that by providing an optimum relation of the physical, choreographic and technical training, the beginner gymnasts' initial training contents is improved.

The results of the study point out the following methodic – practical aspects that lie at the bedrock of the technical training contents improvement at beginner female gymnasts' level:

- The results of the somatic development show a significant progress of the anthropometric measurements data with a poorer homogeneity at the weight.
- The results of the physical training point out significant differences between the average values of the control tests and a good homogeneity for both tests.
- The results of the initial technical training show significant differences at all apparatus, with a good homogeneity at both tests and a close relation with the physical training level of these ones.

The results of the study *validate* the proposed hypotheses, namely:

- An optimum physical training provided at the beginner female gymnasts' level influences upon the efficient

learning of the technical elements needed to the initiation at each apparatus.

- The use of the physical training programs for each training stage improves the technical training contents.
- An optimum relation ensured between the general physical training and the technical training leads to the improvement of the beginner female gymnasts' technical knowledge.

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