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Control and Planning in the Development of Female Gymnasts' Complex of Motor Skills within a Training Macro-cycle

Victor BUFTEA[1]*

Abstract

This paper aims at monitoring the integral training through an efficient control and planning in the development of the female gymnasts' motor skills complex within a training macro-cycle. For this purpose, an experimental ascertaining study was carried out throughout a training macro-cycle of the Olympic cycle 2013-2016, with a group of 20 athletes (n=10 - experimental group and n=10 – control group) belonging to women's artistic gymnastics national team of the Republic of Moldova. The following methods were used: bibliographic study; pedagogical observation; method of specific tests; pedagogic experiment, statistical-mathematical method and method of graphical representation of data. In order to determine gymnasts' motor training, 14 parameters were tested, highlighting the level of complex motricity needed to reach elite sports performances in women's artistic gymnastics. Insignificant differences were revealed in the experimental group based on the results obtained and compared with each other during the 1st training macro-cycle. Following these results, some models and strategies meant to improve the control and planning system were proposed to the experimental group subjects. The implementation of the control and planning system of the activities for motor skills development provided useful information for the efficient monitoring of the full training of the female gymnasts under research.

Keywords: *Gymnastics; test; monitoring; motor training; performance.*

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1. Introduction

Artistic gymnastics has now achieved remarkable progresses that prove that it is developing in line with the trends of high performnce sport but it also has its specific features like: increasing sports mastery, improvement of training components for elite gymnasts etc. [1], [13], [16].

The ultimate goal of training in gymnastics is to obtain the highest sports results which are the main "motor" of gymnastics development. The creation of a training program for a certain period is an important stage that entails the modelling of the training content quantitative and qualitative indicators depending on gymnasts' level and the length of the proposed training cycle. Modelling must optimally focus on all parameters that contribute to the achievement of the intended goals. It is very important to increase the characteristics of the real models and indicators of elite gymnasts' specific training from one Olympic cycle to another [6], [9], [17].

The effectiveness of the training in artistic gymnastics consists in the ability of the coach to organize the appropriate tools of planning with the ultimate goal of obtaining good results in the essential competitions. Thus, the training is based on the following planning documents [17]: perspective plan, annual plan (macro-cycle), stage plan (mezzo-cycle), weekly cycle (micro-cycle) and training lesson.

The annual training plan – the macro-cycle - is the tool that guide the athletic training over a year and is based on training and the principles of sports training. For example, on the case of the acknowledged athletes who have two separate competitions, the plan is bicyclic [17].

In order to check the validity of the training program, a mandatory requirement for each coach is the control and assessment of the training. The control and analysis which are the basis of the training assessment ensure the dynamization of the training process and the progress as well [7], [17].

The establishment of precise or even personalized test events and norms to be achieved physically and technically too within a certain period is a pedagogical requirement with enhancing effect on the training and settlement of the intermediate objectives that lead to the completion of the annual training plan. The physical training in artistic gymnastics has the following sequence [2], [12], [17]: general physical training (preparatory period, basic stage), specific physical training (pre-competitive stage) and development of the specific motor skills which must be maintained at high level (competitive period).

The control and planning of the activities meant to build and develop the gymnasts' motor skills complex implied reports on certain training levels that an elite gymnast must have, taking into consideration the

stages, periods, different case situations, as well as the internal and external conditions of the training process during all micro-, mezzo- and macro-cycles of the four-year cycle [3].

2. Problem Statement

Athletic training is a long-lasting adaptation process that takes place during several years; therefore it can be effectively conducted only by establishing scientifically the objectives, decisions and means. Training structure includes the multi-annual structure (one or two Olympic cycles), macro-structure (annual or multi-annual), mezzo-structure (average duration), micro-structure (system of sessions) and the training session [8], [11].

For that purpose, the planning process should be carried out within longer or shorter strategies, concretized in different programs as for the number of factors taken into account. We consider the Olympic cycle or the four-year plan as a segment of long-term planning. There are two methodological approaches for the (mono-cyclic and bi-cyclic) Olympic cycle organization and planning. An Olympic cyclic plan may follow the similar features of an annual plan as a retrospective where the coach analyzes the dynamics of athlete's physical development, the results in competitions, the tests and standards for each factor of the training [2], [10].

Physical training is a defining component of the entire process of training and determines athletes' performances both in training sessions and competitions. It provides an increased functional capacity of the body through the high development of the specific motor skills, abilities and capacities, the optimal values of morpho-functional indicators, the accuracy of exercises execution and the health status [5], [11].

The motor skills can be characterized by the set of fundamental components met by sports performance; they are also the materials needed to develop the motor performances of each athlete [15].

Out of the bio-motor skills, the strength and power are the most critical ones for many sports. In the case of elite athletes, the relationship of increasing strength, velocity and endurance – bio-motor qualities that play a determining role and are more difficult to develop - depends on the particularities of the sport and its needs [4].

3. Research Questions/Aims of the research

The aim of the research is to monitor the full training through the effective use of the control and planning in the development of gymnasts' motor skills complex over a training macro-cycle.

Hypothesis of the research. We believe that by applying the system of control and planning of the activities for motor skills development during the training we shall get useful information for the efficient monitoring of the full preparation of the gymnasts-subjects of the research.

4. Research Methods

With this purpose in view we conducted an ascertaining experimental study throughout the first training macro-cycle of the Olympic cycle 2013-2016 within the national team of women's of the Republic of Moldova, with a group of 20 athletes (n=10 - experimental group and n=10 – control group).

The following methods were used in this research: the bibliographic study of the specialized literature by analyzing the planning and control documents of the Olympic sport in general and artistic gymnastics in particular; the pedagogical observation meant to monitor gymnasts' progresses in training sessions and competitions throughout a training macro-cycle; the method of specific tests involving the test events applied to evaluate the level of physical training [14]; the pedagogical – formative experiment; the statistical-mathematical method for calculating the most usual statistical indicators and the comparative analysis of the differences of mean between groups; the graphical representation of data.

In order to determine the gymnasts' motor training, 14 parameters were tested: 1) speed running 20 m (sec), 2) standing high jump (cm), 3) standing long jump (cm), 4) deep jump with floor repulsion (cm), 5) arms bending and unbending from handstand on low parallel bars (no of reps), 6) from hanging position, legs raising up to the grip point (no of reps), 7) power handstand from straddled bent standing on the floor (no of reps), 8) rope climbing on 3m without legs support (s), 9) supported high piked position maintained (s), 10) backward horizontal hanging maintained (s), 11) mounting on low bar by stretched handstand (no of reps), 12) Romberg's test for coordination (s), 13, 14) jump with turn to the right and to the left - Matorin test (degrees).

5. Findings

Table 1 presents the results of the comparative analysis of the ascertaining testing of the gymnasts' motor skills complex during the first macro-cycle of training.

Table 1. Comparative analysis of the ascertaining test results of gymnasts' motor skills complex during macro-cycle I

No.	Tested parameters	Groups		t	p
		Eperimen.	Control		
		x±m			
1	Speed running on 20 m (s)	3.91±0.09	3.98±0.09	0.55	>0.05
2	Standing high jump (cm)	45.50±1.44	46.0±1.44	0.25	>0.05
3	Standing long jump (cm)	196.60±2.67	200.50±1.85	1.20	>0.05
4	Deep jump with floor repulsion (cm)	44.50±1.44	45.30±1.23	0.42	>0.05
5	Arms bending and unbending from handstand on low parallel bars (no of reps)	2.80±0.41	2.60±0.41	0.34	>0.05
6	From hanging position, legs raising up to the grip point (no of reps)	6.50±0.92	6.70±0.62	0.18	>0.05
7	Power handstand from straddled bent standing on the floor (no of reps)	5.10±0.82	4.80±0.72	0.27	>0.05
8	Rope climbing on 3m without legs support (s)	6.77±0.10	6.98±0.15	1.17	>0.05
9	Supported high piked position maintained (s)	3.23±0.72	2.64±0.72	1.37	>0.05
10	Backward horizontal hanging maintained (s)	4.6±0.72	4.5±0.82	2.07	>0.05
11	Piked hanging from the low bar, mounting by stretched handstand (no of reps)	4.10±0.21	4.0±0.31	0.28	>0.05
12	Romberg's test of coordination (s)	42.70±0.82	42.10±0.72	0.55	>0.05

13	Jump with turn to the right – Matorin test (degrees)	279.8±0.92	279.60±0.92 0.15	>0.05
14	Jump with turn to the left - Matorin test(degrees)	328.60±1.13	326.70±1.23 1.14	>0.05

The results of the comparative analysis reveal the level of complex motricity of the female gymnasts-subjects of the research in terms of speed running over 20m, muscular strength of lower and upper limbs, combined muscular strength (shoulders, back and abdomen), muscular strength in isometric contraction, specific strength for execution of handstand stretching on the low bar and coordination.

Figure no. 1 shows the ascertaining results of the gymnasts under research regarding the strength of the lower limbs tested in three test events: standing high jump, standing long jump and deep jump with floor repulsion.

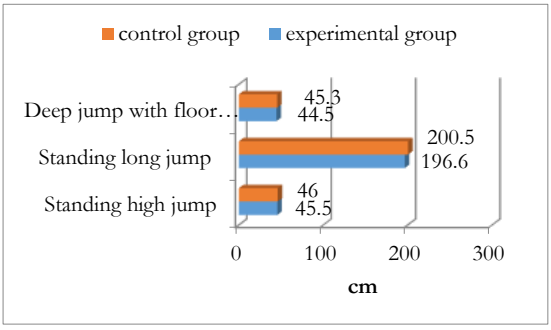

Fig. 1. Strength of lower limbs of the gymnasts aged 12 to15 years

In fig. 2 are presented the ascertaining results of the isometric muscular strength of the female gymnasts under research in terms of backward horizontal hanging maintained and supported high piked position maintained.

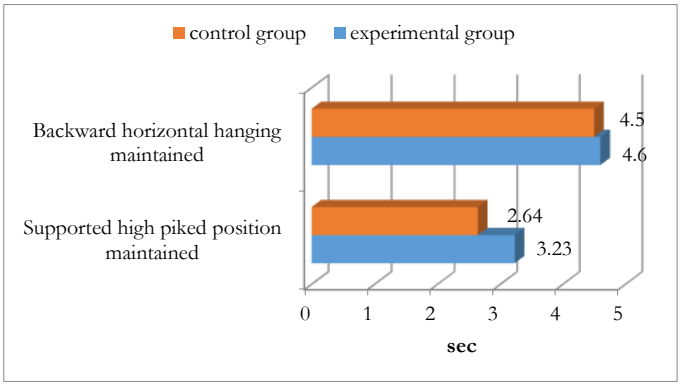

Fig. 2. Isometric muscular strength of the gymnasts aged 12 to15 years

Figure 3 shows the results of the general coordination of 12 to 15 years old gymnasts evaluated by means of Matorin test, by jump with turn to the right and to the left.

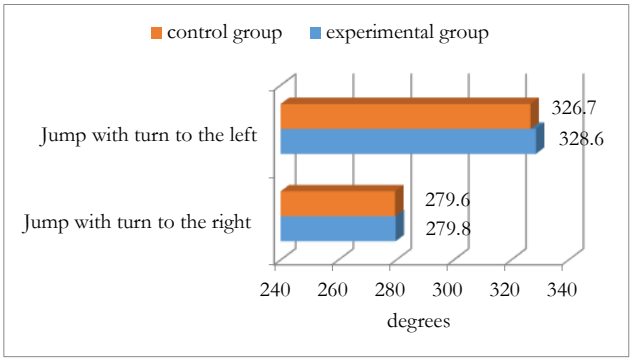

Fig. 3. Matorin test of general coordination in case of 12 to 15 years old gymnasts

6. Discussions

In order to efficiently highlight the control and planning of motor skills development in the gymnasts aged 12 to 15 years concerning the full training monitoring over a training macro-cycle there were tested 14 parameters.

For example, we present some of the most important parameters, namely (table no. 1):

-the strength of lower limbs (fig. 1), evaluated by standing long jump, standing high jump and deep jump with floor repulsion, reveals better values in the control group and insignificant differences between groups at $P>0.05$;

-the strength of isometric abdominal and back muscles (fig. 2), evaluated by supported high piked position maintained and backward horizontal hanging maintained, highlights better values in the experimental group and insignificant differences between groups at P>0.05;

-the general coordination (fig. 3), evaluated by Matorin test, has close values between groups at the turn to the right and better values at the turn to the left in the experimental group and insignificant differences between groups at P>0.05.

The comparative analysis of the ascertaining tests results concerning gymnasts' motor skills in the macro-cycle I shown in table no. 1 highlights insignificant differences between groups; the results are compared to each other during the macro-cycle I of training.

Also, following the results obtained, the subjects of the experimental group were proposed to develop models and strategies for improving the control and planning system.

7. Conclusions

The results of the comparative analysis highlight the level of complex motricity needed to achieve high sport performances in women's artistic gymnastics.

The analysis of the share of performances obtained by the two groups in their motor training pointed out insignificant differences at P>0.05 in the calculation of the statistical indicators tested during the first macro-cycle of the Olympic cycle.

The implementation of the system of control and planning of the activities for motor skills development provided useful information for monitoring effectively the full training of the gymnasts-subjects of the research, which confirms the hypothesis of the research.

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