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Original article

REFERENCES ON THE FORMATION OF COGNITIVE COMPETENCIES OF ELITE FEMALE GYMNASTS

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Abstract*

Aim. The main purpose of this paper is to test the theoretical cognitive competences of elite female gymnasts in order to know and apply them in practice.

Methods. This scientific approach led to the organization of an experimental study on the "Control and Planning of the Training Process of Elite Female Gymnasts in an Olympic Cycle". The following methods were used: bibliographic study of the theoretical-conceptual, methodological and practical essences presented in the scientific-methodical specialized literature and study of documentary materials; pedagogical observation; method of specific tests; pedagogical experiment, statistical-mathematical and data graphical representation methods. The experimental study was conducted from 2013-2016, with two research groups (experimental, n=10 and control, n=10). The testing of cognitive competences aimed at the knowledge about the sport event –artistic gymnastics –Olympic event, the basic components of competitive polyathlon and the specific character of work on apparatus etc. The knowledge and application in practice by athletes of this specific information and other useful information were evaluated by the respective experts (theorists and practitioners) according to the scoring system from 1 to 10 points.

Results. The experimental research results show that in the first tests both examined groups have almost the same level of theoretical training (in the second year of Olympic macro-cycle): 5.00 points were obtained by 48.75% of the experimental group subjects and by 43.75% of the control group subjects. Scores of 6.00 points were obtained by 35.0% and 37.5% respectively. The subjects know at a sufficient level the application of the exercises for special physical development, application of execution technique of the elements of competitive program and the similar disciplines (choreographic exercises, rhythmic gymnastics, technology of using the exercises on elastic trampoline and acrobatic gymnastics).

Conclusions. It appears that the mechanism of control and planning of cognitive competences formation influenced positively the training process of gymnasts which contributed constructively to the development and improvement of intellectual aspects, to the enhancement of the attitude for obtaining more pronounced values and training levels that influenced the achievement of sports performance.

Keywords: gymnastics, knowledge, competences, specific testing, theoretical training.

Introduction

The strategic elements of contemporary sport aim at the ascending trends of improvement of athletes' training systems in all Olympic events (Arkaev, Suchilin, 2004).

Women's artistic gymnastics is listed among the sports that have undergone changes in the competitive regulations of the Code of Points in terms of structural and contents particularities, including the control and planning forms of the training activity, which raises a particular motivation in the sense of in-depth study of these issues (Buftea, 2016).

Obviously, this goal has recently led to the intensification of the training process and competitive activity taken as a whole (Platonov, 2015, Dragnea,

Mate-Teodorescu, 2002, Nicu, 1993, Simion, 2011).

Determined by the complex character of achievement of the exercises related to the rigors of a high level of control and planning of the technical, physical, functional, psychological and tactical training, the artistic gymnastics requires athletes to maximally mobilize the body reserves and the entire functional potential, psycho-motor balance and other capacities under the actual intensification of the training process. All these elements are influenced by an integral system of the control and planning forms of the training activity, especially during the advanced stage of sports mastery (Buftea, Filipenco, 2016; Grigore, 2001; Grimalschi, 2015; Niculescu, 2010; Potop, V. 2014; Solomon, 1996; Rusu, Pașcan, Grosu, Cucu, 1999).



In this respect, the specialists of this subject area have carried out and are still carrying out researches that document the complexity of this event with various morpho-functional, anatomo-physiological, kinetic, biomechanical, psychological-pedagogical information, problems related to physical and technical training indices, to selection, prognosis, study of gymnastics exercises starting from a very early age and other issues.

Thus, the theoretical-methodological and practical-technical arsenal of artistic gymnastics contains a large amount of theoretical, methodical and, obviously, experimental-practical information that determines in general the specificity of this event, where the control and planning elements have a significant character (Vieru, 1997; Gaverdovskij, 2014).

The main *purpose of this paper* is to test the theoretical cognitive competencies of elite female gymnasts in order to know and apply them in practice.

Hypothesis of the paper. We believe that the testing of the cognitive competencies necessary for elite gymnasts' theoretical training will contribute to the improvement of knowledge and its application in practice more effectively.

Methods

This scientific approach entailed the organization of an experimental study on the research topic "*Control and Planning of the Training Process of Elite Female Gymnasts in an Olympic Cycle*".

The following methods were used in this research: bibliographic study of the theoretical-conceptual, methodological and practical essences presented in the scientific-methodical specialized literature and study of documentary materials; pedagogical observation; method of specific tests; pedagogical experiment, statistical-mathematical and data graphical representation methods.

The experimental study was conducted throughout the period 2013-2016, with two research groups (experimental group, n=10 and control group, n=10).

Thus, the study of core themes in the *experimental program* included:

1. Knowledge of the sport event-artistic gymnastics –Olympic event (short history of the event).
2. Knowledge of the basic components of competitive polyathlon and specific work on apparatus.

3. Knowledge of the notions of traumas prevention during training sessions and in different phases, apparatus, elements, exercises.

4. Knowledge and application of self-securing in different executions and, in special cases, help and secure procedures.

5. Knowledge and application of working specific terminology (terms consistent with the nomenclature, correct from terminological point of view).

6. Knowledge of exercises for general physical training (GPT).

7. Knowledge of exercises for special physical training (SPT).

8. Knowledge of execution technique of various elements and movements included in the program of study at the training stage (program for Master of Sports and for International Class Master of Sports) on all apparatus (handspring vaults, balance beam, uneven bars, routines on the floor); also knowledge of execution technique of the special exercises performed on different aiding equipment and devices.

9. Knowledge of regulations, principles, basic laws for achieving high sports mastery in the multi-annual instructional approach.

10. Knowledge and application of exercises and technique to perform similar disciplines (choreography, movements of rhythmic gymnastics, trampoline gymnastics, equilibristics, circus art, acrobatic gymnastics, jumping on trampoline etc.) meant to complete the arsenal of skills in terms of analogical and identical exercises by form, structure and content.

11. Knowledge of working program: long-term, medium-term and short-term plans, projects of lessons per training sessions etc., in order to form perspective plans of training.

12. Knowledge of competitive regulation, Code of Points, competition schedule, judging system, marking system, scoring system, penalties for incorrect executions and unsportsmanlike conduct.

13. Knowledge and application of musical accompaniment for routines on the floor, presentation of symbols written on the worksheets and event sheets, combinations of elements and combinations in competition.

14. Knowledge and application of the elements included in the competitive combinations on all apparatus and of other information related to the anatomical – physiological, medical - biological issues, diet, recovery conditions, biomechanical particularities, chemical compositions, special nutrition varieties etc.



The knowledge and application by athletes of this information and of other useful information as well were evaluated by experts (theorists and practitioners) according to the scoring system from 1 to 10.

Results

The results of cognitive-intellectual competencies demonstrated by gymnasts are shown in table 1 and figures 1, 2 and 3.

Table 1. Summarizing table of the statistical indicators of cognitive competencies of the gymnasts of the experimental and control group in the training Olympic cycle.

Macro-cycles of Olympic cycle	Examined groups	Grades / %						No. grades, %
		5	6	7	8	9	10	
II (2013 – 2014)	Experimental (n=10)	39	28	9	4			80
		48.75	35.0	11.25	5.0			100%
	Control (n=10)	35	30	12	3			80
		43.75	37.5	15.0	3.75			100%
III (2014 – 2015)	Experimental (n=10)			4	36	34	6	80
				5.0	45.0	42.5	7.5	100%
	Control (n=10)		4	25	39	12		80
			5.0	31.25	48.75	15.0		100%
IV (2015 – 2016)	Experimental (n=10)				3	50	27	80
					3.75	62.5	33.75	100%
	Control (n=10)			11	46	20	3	80
				13.75	57.5	25.0	3.75	100%

In essence, the formation of cognitive competencies in this study directs the percentage correlation of the training level in favor of the female gymnasts belonging to the experimental group, which is also shown in figure 1.

This study has also taken into consideration the knowledge by gymnasts of some effective training strategies that led to new discoveries and understanding of certain concepts, phenomena, laws, hypotheses, theories etc.

The cognitive competencies acquired by the gymnasts contributed to the achievement of training process objectives and influenced the increase of sports mastery level.

Control and planning were the core factors that guided the activity of study of gymnasts with the

respective degree of exigency; therefore the knowledge did not aimed especially at the personal development but the specific professional development of the intellectual and motor skills in order to validate the training efficiency. It is worth mentioning that the training process of the female gymnasts within the specialized sports school is not an academic one which includes classes scheduled according to a set timetable.

The controls and verifications made during the preventive research have led to the idea of promoting this form of training which is considered mandatory and which supports the multi-faceted training of the female gymnasts - subjects of the study.

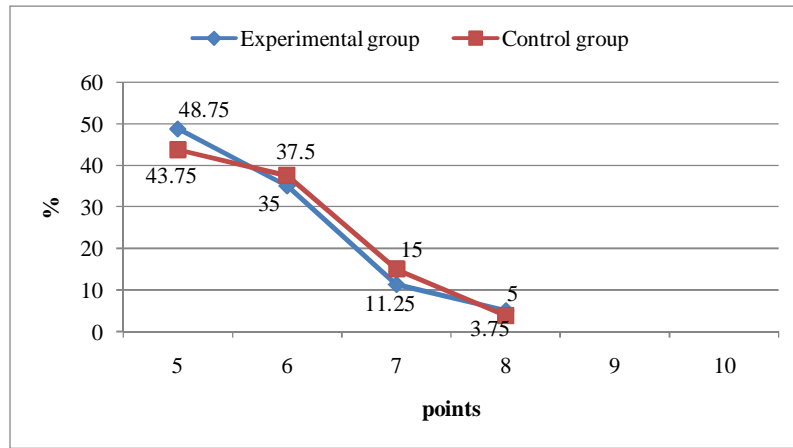


Fig. 1. Results of cognitive competencies formation of gymnasts in the 2nd macro-cycle of the Olympic cycle

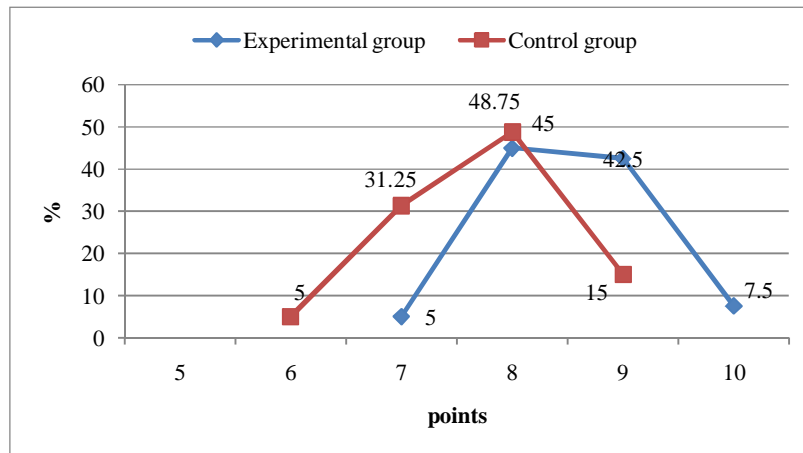


Fig. 2. Results of cognitive competencies formation of gymnasts in the 3rd macro-cycle of the Olympic cycle

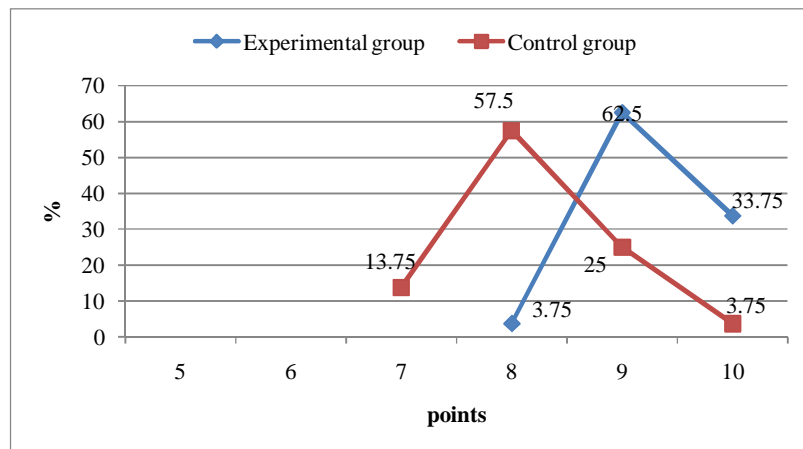


Fig. 3. Results of cognitive competencies formation of gymnasts in the 4th macro-cycle of the Olympic cycle



Discussion

The results of the experimental research highlight that during the first tests both groups have almost the same level of theoretical training (Grigore, 2001; Potop, 2014) (in the 2nd year of the Olympic macro-cycle), getting scores of 5.00 points (48.75% of the experimental group subjects and 43.75% of the control group) and 6.00 points (35.0% and 37.5% respectively) (figure 1).

The subjects know well enough how to apply the exercises for special physical development, the execution technique of the competitive program elements and the similar disciplines (choreographic exercises, rhythmic gymnastics, technology of using the exercises on elastic trampoline and acrobatic gymnastics).

The tasks involving a high level of knowledge of sports training factors required the gymnasts to have the capacity to synthesize, evaluate and characterize more effectively by completing the previous knowledge and solving complex issues of combination, projection, interpretation and evaluation. 80% of the subjects obtained scores of 9.00 points especially for the factors of application of general physical development, while 70% of the subjects obtained scores of 8.00 points for the knowledge of the specific terminology. Weekly verifications were carried out throughout the annual macro-cycles in conformity with the objectives determined by the study of the theoretical information in direct contact during training sessions and individually as well (Potop, 2015).

In the 3rd macro-cycle of the Olympic cycle, the formation of cognitive competencies includes another diapason of knowledge depending on the practical training objectives of the exercises, namely: knowledge of elements technique of execution and elements difficulty degree; knowledge of the sequence and connections of elements and the accuracy of connection phases; knowledge of the number of changes that can take place in the body during different exercises; increase of the intellectual manifestation in the construction of different compositions on the apparatus of the competitive polyathlon etc.

In this sense, the conditions of compulsory knowledge of all issues specific to sports training from a theoretical point of view influenced the gymnasts towards a high concentration of the thinking capacity in order to subsequently achieve certain syntheses in the evolution of the integral training.

Based on the previously acquired knowledge, the female gymnasts also tended to be aware of different problematic situations that may arise during the training process so as to timely intervene with new and correct decisions known in advance in order to prolong effectively the training actions. The gymnasts got also acquainted with certain documents for training activity development, with certain performance descriptors, evaluation mechanisms, requirements for passing to next training level.

The analysis of the data presented in the summarizing table reveals that regarding the knowledge of the applicability of general physical development exercises, for example, 80% of the experimental group subjects obtained grades of „9” (according to 1 of 10 rating system); 70% demonstrate knowledge of the terminological aspects specific to this training macro-cycle deserving the grade „8” etc.

Turning back to the statistical indicators shown in the summarizing table, it is found out that the gymnasts of the experimental group obtained better results in the theoretical training compared to the control group during the 3rd macro-cycle of the Olympic cycle, namely: 47.5% got scores of 9.00 points and 7.5% got scores of 10.00 points. As for the control group, 48.75% of the gymnasts obtained scores of 8.00 points and 15.0% - scores of 9.00 points (Figure 2).

We mention that the psycho-pedagogical experiment performed with the gymnasts of the experimental group was carried out during the training process and throughout the 4th macro-cycle of the Olympic cycle. The target of the gymnasts in the experimental group was to apply the cognitive competencies formed during the in-depth training for execution technique of competitive elements and compositions and also other preparation issues at each training session.

One of the main conditions of cognitive competencies formation was the guiding of gymnasts' individual work for studying the characteristic informational materials on the topics included in the experimental program. According to the circumstances created, the gymnasts presented their views on certain subjects in front of the Commission for Evaluation.

As mentioned before, the formation of cognitive competencies continued in the 4th year of the Olympic cycle too. Analyzing the results shown in the Summarizing table and Figure 3 it is noted that the number of high grades obtained by the gymnasts of the experimental group increases, namely: grades



of „9” are obtained by 62.5%, and 33.75% demonstrate knowledge deserving the grade „10”. The control group have lower results: the grades of „9” are obtained by 25.0%, and the grades of „10” by 3.75%.

Conclusions

In conclusion it is found out that the mechanism of control and planning of cognitive competencies formation influenced positively gymnasts' training process, which contributed positively to the development and improvement of the intellectual aspects, to the increase of the attitude for obtaining more pronounced values and training levels that had an influence on the achievement of sports performance.

Hence the formation of cognitive competencies during this research offered a double distinction: the intellectual development and its effective contribution to the training methodology applied in the integral training process of the gymnasts.

Acknowledgments

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