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Original article

OPTIMIZING MOTOR CAPACITY IN VOLLEYBALL, AT THE LEVEL OF JUNIORS, THROUGH SPECIFIC TRAINING

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Abstract

Problem. In the specific training of the player and the team, the strategy represents the specificity of the process approach, the set of objectives, the main ways of achieving them, the human and material resources involved in order to obtain superior performances.

Objective. Determining the viability of our approach starting from the coordinates that characterize the initial level of specific motor capacity, including the level of training of the subjects included in the research and the verification of the means, methods and efficiency of the applied work programs.

Methods. In the experiment we followed the evolution of two samples consisting of 12 volleyball players - members of the junior team of the Technical College Mihai I in Bucharest, respectively 12 volleyball players operating at the same competitive level - within the CS Dinamo Bucharest team and we used , bibliographic documentation; interpretation of statistical and mathematical method; graphical representation method.

Results. It is observed that the specific motor skills register value increases, with a more significant progress in the experiment group - reflected by the significant differences registered between the averages of the two groups at the final test.

Conclusions. The hypothesis is confirmed according to which the optimization of the training model, by applying specific technical-tactical structures on the game phases, can lead to the increase of the athletes' motor baggage and implicitly to the extension of the efficient expression capacity during the game, thus contributing to the performance objectives. of teams.

Key Words: volleyball, motors skils, specific training, juniors, players.

Introduction

Changes in world volleyball, both in terms of maximizing content and structure parameters, and the level of demand of players in physical, mental, biomotor and technical-tactical, once again confirm the need to find the most effective ways to optimize and support capacity of performance.

Viewed beyond its own complexity, generated by the quality of its subject - the athlete, performance capacity, is represented by a sum of abilities (Dragnea, A., Mate-Teodorescu, S., 2002, p. 319), including motor ability and effort and can be optimized by improving its components and the relationships between them.

According to Bauersfeld and Schroter (1979), quoted by Epuran, M. (2001, p.43) performance depends on three categories of factors: specific to the external environment (material conditions, competition), specific to the athlete (development, qualities) and training (technical, tactical and physical).

In the specific training of the player and the team, the strategy represents the specificity of the process approach, the set of objectives, the main ways of achieving them, the human and material resources involved in order to obtain superior performances (González-Silva J., Moreno A., Fernández-Echeverría C., Claver F., Moreno M. P., 2016).

In the process of special technical training, the athlete acquires the technique of the branch - knows the biomechanical laws of movements and actions related to the object of sports specialization and practically acquires the appropriate motor skills and abilities, bringing them to the highest possible perfection (Matveev, 1980). Similarly, in volleyball, following the specialization on positions, the players perfect their individual technique required by the profile of the position until reaching the highest degree of mastery (Drikos S, Kountouris P, Laios A, Laios Y. Correlates, 2009).

Technical mastery is the result of training (collective and individual) and self-training, to which

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must be added the "vocational predispositions" for the game. (Colibaba-Evuleț, D., Bota , I. 1998).

The experimental approach, developed and presented, has as main goal the optimization of the performance capacity of the juniors, by elaborating and applying in training specific action systems, thus aiming to lay the foundations for obtaining superior sports performances, within the level of age (Sheppard, J.M., & Young, W.B. 2006).

Hypotheses research

The optimization of the training model, by applying specific technical-tactical structures on the game phases, can lead to the increase of the athletes' motor baggage and implicitly to the extension of the efficient expression capacity during the game, thus contributing to the team's performance objectives.

Methods

During the experiment we followed the evolution of two samples consisting of 12 volleyball players - members of the junior team of the Mihai I Technical College in Bucharest, respectively 12 volleyball players working at the same competitive level - within the CS Dinamo Bucharest team.

The subjects are aged between 16 - 18 years and have met the conditions for participation in the National Volleyball Championship - 2018 - 2019 edition, Men's Junior Division.

The teams benefited from similar working and testing conditions, the material base allowing the experiment to be carried out in good conditions.

In order to optimally carry out the research and achieve a scientific framework, we considered it important to solve the following tasks.:

- Permanent scientific documentation on performance capacity, technical, tactical and physical training in sports games and especially in volleyball, respectively inventory of methods, means and materials used to improve specific indices.
- The organization and development of the experiment involved the following aspects:
  - ✓ choosing the subjects for the experimental and control samples;
  - ✓ organizing and conducting the initial testing;
  - ✓ following the coordinator of the application of the training programs (at the experiment group);
  - ✓ organizing and conducting the final testing.
- Data collection, analysis, processing and interpretation.
- Elaboration of conclusions and proposals.

The means used in carrying out the training:

For motor skills and technical procedures of attack and defense*:*

- dynamic games;
- mixed circuits;
- technical circuits;
- structures of exercise for: passes, takeover, service, attack, blocking.

For individual and collective tactical actions of attack and defense*:*

- technical attack-defense complexes;
- attack exercise structures;
- structures of exercises for defense;
- complex structures for: passes and attack, individual attack and block, attack and defense in the second line, service and reception from service.

For attack and defense game systems*:*

- exercise structures for attack systems: against the system with the center 2 withdrawn or on the corridor, against the individual blockade, against the collective blockade;
- exercise structures for defense systems: against the 5T + 1R system, against attacking combinations.

To check the level of training and apply the themes of attack and defense are used: school game, training game, check game, official game.

Results

To observe the evolution of the groups in the experiment, we calculated the progress in absolute value and in percentages (D_{21} = T_2 – T_1; $D_{21}(\%) = \frac{T_2 - T_1}{T_1} * 100$, where: T_1 - initial testing; T_2 - final testing), but also the differences between the group averages ($\overline{X}$ Ge - $\overline{X}$ Gc) at the two tests. To check if the differences between the calculated averages are significant or not, we applied the Student Test.

Table 1 Statistical parameters for Waist

	Experiment group (Ge)				Control group (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(cm)	(%)			(cm)	(%)	(cm)	(%)	(cm)	(%)
$\overline{X}$	183,21	184,36	1,15	0,63	178,67	180,29	1,62	0,91	4,54	2,54	4,07	2,26
S	8,35	8,35	-	-	6,74	6,59	-	-				
Cv	4,56	4,53	-	-	3,77	3,66	-	-				
t	t_c=6,449>3,012(t_t) p<0,01				t_c=13,00>3,106(t_t) p<0,01				t_c=1,51<2,064(t_t) p>0,05		t_c=1,36<2,064(t_t) p>0,05	

Table 2 Statistical parameters for Weight

	Experiment group (Ge)				Control group (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(kg)	(%)			(kg)	(%)	(kg)	(%)	(kg)	(%)
$\overline{X}$	72,86	73,64	0,78	1,07	70,25	71,17	0,92	1,31	2,61	3,71	2,47	3,47
S	10,73	10,59			7,31	7,78						
Cv	14,73	14,38			10,41	10,93						
t	t_c=4,579>3,012(t_t) p<0,01				t_c=4,329>3,106(t_t) p<0,01				t_c=0,71<2,064(t_t) p>0,05		t_c=0,67<2,064(t_t) p>0,05	

Table 3 Statistical parameters and differences calculated for the Quetelet index

	Experiment group (Ge)				Control group (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(g/cm)	(%)			(g/cm)	(%)	(g/cm)	(%)	(g/cm)	(%)
$\overline{X}$	396,69	398,48	1,79	0,45	392,46	393,96	1,50	0,38	4,23	1,08	4,52	1,15
S	47,22	45,96			28,62	31,12						
Cv	11,90	11,53			7,29	7,90						
t	t_c=1,591<2,160(t_t) p>0,05				t_c=1,294<2,201(t_t) p>0,05				t_c=0,27<2,064(t_t) p>0,05		t_c=0,29<2,064(t_t) p>0,05	

For specific motor skills tests - evaluation of service and game phases - data processing and analysis of results, we used the statistical recording program.

Table 4 Statistical parameters and differences calculated for the service

	Grupa de experiment (Ge)				Grupa de control (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(pct)	(%)			(pct)	(%)	(pct)	(%)	(pct)	(%)
$\overline{X}$	7,50	9,00	1,50	20,00	7,09	7,91	0,82	11,57	0,41	5,78	1,09	13,78
S	0,52	0,60	-	-	0,70	0,83	-	-				
Cv	6,93	6,67	-	-	9,87	10,49	-	-				
t	t_c=6,514>3,106(t_t) p<0,01				t_c=4,50>3,169(t_t) p<0,01				t_c=1,60<2,080(t_t) p>0,05		t_c=3,63>2,831(t_t) p<0,01	

The evolution of the experiment group*:*

Between the initial test and the final test, there was an increase in performance by 20.00% (1.50 points). The group is homogeneous in both tests (Cv1 <10%; Cv2 <10%). The Student's test shows that the difference between the averages obtained in the two tests is significant ($t_{calculated}$=6,514 > 3,106=t_{table}, p<0,01).

Evolution of the control group*:*

The increase registered between the two tests is 11.57% (0.82 points). The group is homogeneous on initial testing (Cv1 <10%) and relatively homogeneous on final testing (Cv2 <20%). Applying the Student Test it is observed that the difference between the averages of the two tests is significant ($t_{calculated}$=4,50 > 3,169=t_{table}, p<0,01).

Differences between group averages:

In the initial test, the average of the experiment group is 0.41 points (5.78%) higher than the average of the control group. At the final test this difference increases to 1.09 points (13.78%). Initially, the difference between the means of the two groups is not significant ($t_{calculated}$=1,60 < 2,080=t_{taeel}, p>0,05), but at the final test there is a significant difference between the means of the two groups ($t_{calculated}$=3,63 > 2,831=t_{taeel}, p<0,01).

Table 5 Statistical parameters and differences calculated for the side out phase

	Experiment group (Ge)				Control group (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(pct)	(%)			(pct)	(%)	(pct)	(%)	(pct)	(%)
$\overline{X}$	7,14	8,86	1,72	24,09	7,00	8,00	1,00	14,29	0,14	2,00	0,86	10,75
S	0,66	0,66	-	-	0,74	0,85	-	-				
Cv	9,24	7,45	-	-	10,57	10,63	-	-				
t	t_c=13,682>3,012(t_t) p<0,01				t_c=4,690>3,106(t_t) p<0,01				t_c=0,52<2,064(t_t) p>0,05		t_c=2,88>2,064(t_t) p<0,05	

The evolution of the experiment group:

Between the initial test and the final test, there was an increase in performance by 24.09% (1.72 points). The group is homogeneous in both tests (Cv1 <10%; Cv2 <10%). The Student's test shows that the difference between the averages obtained in the two tests is significant ($t_{calculated}$=13,682 > 3,012=t_{table}, p<0,01).

The evolution of the control group:

The increase between the two tests is 14.29% (1 point). The group is relatively homogeneous in both tests (Cv1 <20%; Cv2 <20%). Applying the Student Test it is observed that the difference between the averages of the two tests is significant ($t_{calculated}$=4,690 > 3,106=t_{table}, p<0,01).

Differences between group averages:

In the initial test, the average of the experiment group is 0.14 points (2.00%) higher than the average of the control group. At the final test this difference increases to 0.86 points (10.75%). Initially, the difference between the means of the two groups is not significant ($t_{calculated}$ = 0.52 <2.064 = table, p> 0.05), but at the final test there is a significant difference between the means of the two groups ($t_{calculated}$=2,88 > 2,064=t_{table}, p<0,01).

Table 6 Statistical parameters and calculated differences for the break point phase

	Grupa de experiment (Ge)				Grupa de control (Gc)				$\overline{X}$ Ge - $\overline{X}$ Gc			
	T_1	T_2	D_{21}		T_1	T_2	D_{21}		T_1		T_2	
			(pct)	(%)			(pct)	(%)	(pct)	(%)	(pct)	(%)
$\overline{X}$	6,79	8,57	1,78	26,22	6,67	7,83	1,16	17,39	0,12	1,80	0,74	9,45
S	0,70	0,85	-	-	0,65	0,72	-	-				
Cv	10,31	9,92	-	-	9,75	9,20	-	-				
t	t_c=11,541>3,012(t_t) p<0,01				t_c=10,383>3,106(t_t) p<0,01				t_c=0,45<2,064(t_t) p>0,05		t_c=2,37>2,064(t_t) p<0,05	

The evolution of the experiment group:

Between the initial test and the final test, there was an increase in performance by 26.22% (1.78 points). The group is relatively homogeneous on initial testing (Cv1 <20%) and homogeneous on final testing (Cv2 <10%). The Student's test shows that the difference between the averages obtained in the two tests is significant ($t_{calculated}$=11,541 > 3,012=t_{table}, p<0,01).

The evolution of the control group:

The increase registered between the two tests is 17.39% (1.16 points). The group is homogeneous in both tests (Cv1 <10%; Cv2 <10%). Applying the Student Test it is observed that the difference between the averages of the two tests is significant ($t_{calculated}$=10,383 > 3,106=t_{table}, p<0,01).

Differences between group averages:

In the initial test, the average of the experiment group is 0.12 points (1.80%) higher than the average of the control group. At the final test this difference increases to 0.74 points (9.45%). Initially, the difference between the means of the two groups is not significant ($t_{calculated}$ = 0.45 <2.064 = table, p> 0.05), but at the final test there is a significant difference between the means of the two groups ($t_{calculated}$=2,37 > 2,064=t_{tleel}, p<0,01).

Discussion

The analysis of the data recorded in the case of somatic measurements and indices and their comparison with those specified in the model envisaged by the specialized federation for this age category reflects the following:

In the case of the waist, even if at the two tests the arithmetic averages registered by the two groups are lower than the value specified in the waist model (193 / 190cm), aspect favored by the average age of

the subjects (each team having players from the category "Cadets"), between the two tests there are statistically significant increases (by 1.15 cm in the experiment group and by 1.62 cm in the control group), both groups following a development of the organism that falls within the limits normal for the age of their components.

In the case of weight, it can be deduced from the values mentioned for the waist and the G / T ratio (Quetelet Index) as being in the range 73.34 - 81kg. At the initial test, the averages recorded by the two groups are below the lower limit of the range (by 0.40 kg - experiment group and by 3.09 kg - control group). In the final test, the experiment group reaches the lower limit of the range, and the control group reduces the difference to 2.17 kg. The appearance is due to the age of the subjects. Although the averages of the experiment group are closer to the values of the model, the differences between the averages of the two groups are not significant, both showing a favorable evolution from one test to another (0.78 kg - experiment group; 0.92 kg - control group).

The calculated nutrition index, reflected by the ratio of weight to height, falls within the recommended range (380-420), in both tests, both in the experimental group and in the control group..

Regarding the execution capacity of the specific content elements (of the game and service phases), the following aspects are found.:

At the initial testing, the hierarchy of the game phases according to the absolute value of the average of the marks obtained, in both groups, is: phase I (7.14 points - experiment group and 7.00 points - control group) and phase II- a (6.79 points - experiment group and 6.67 points - control group). At the final test, the hierarchy is kept: side-out (8.86 points - experiment group and 8.00 points - control group) and break points (8.57 - experiment group and 7.83 - control group).

In terms of progress, it is higher at break points in both groups (1.78 points - experiment group; 1.16 points - control group) than in phase I (1.72 points - experiment group). 1 point - control group).

Regarding the evolution of the two groups at work, there is a more significant progress in the case of the experiment group (1.50 points) than in the case of the control group (0.82 points)..

In essence, it is observed that the specific motor skills register value increases, with a more significant progress in the experiment group - reflected by the significant differences registered between the averages of the two groups at the final test.

The evolution of the game must thus be followed by an analysis that will offer viable specialists viable solutions to address the various components of performance (Palao JM, Santos JA, Ureña A, 2004). including those of training specific to each level, an approach materialized in the end by selecting the most effective means of training (which is faithful to the structure and demand of the game) designed to ensure success in competition.

The efficiency of the training models is conditioned by the meeting of the optimal framework revealed by: the quality of the training process, respectively by the approach of its factors, the quality of the human material (reflected by the somatic type, the motor and psychic capacity of the players). of the efficiency of the means used (Costa G., Caetano C., Ferreira N., Junqueira G., Afonso J., Costa RP, et al., 2011).

Also, the observation and analysis of high-level competitions allow the diagnosis of new trends in the evolution of the game itself, which determines the search for new ways to optimize performance in modern volleyball, because it has reached an increasingly evolving higher in all its training plans (Silva CD, Tumelero S., 2007).

Conclusions

From a motor point of view, there are value increases of general and specific motor skills in the case of both groups included in the research, but the progress is higher in the experimental group.

In the case of specific motor tests for assessment on the play and service phases, the differences recorded in the final test are significant at $p < 0.01$ at work (13.78%), and at $p < 0.05$ in the case of phase I (10.75%) and phase II (9.45%).

In conclusion, the hypothesis is confirmed that the optimization of the training model, by applying specific technical-tactical structures on the game phases, can lead to increasing the motor baggage of athletes and thus to expanding the ability to express expression during play, thus contributing to team performance goals.

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