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INFLUENCE OF VIDEO / BIOMECANICAL ANALYSIS ON VALENCES OF MORPH-FUNCTIONAL AND SENSO-MOTOR PARAMETERS OF THE VOLLEYBALL PLAYERS

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Abstract: *In this paper, we tried to emphasize the effects that video analysis and biomechanical analysis have on functional, sensory and motor parameters. In the purview pedagogical approach were tested initially and finally, a number of parameters. All tests, the values obtained were better experimental group, P <0,05,0.01.*

Key words: *video analysis, biomechanical analysis, functional parameters, sensory parameters, motor parameters, pedagogical research*

1. Introduction

The physical exercise causes functional, biochemical, morphological changes and simultaneously helps to educate the aspect of personality. Between dosing and adaptation of the physical effort are close relations, that must be taken into account in conducting methodical training process.

The processes of adaptation to exercise is triggered only when the stimulus reach an intensity proportional to the capacity of individual effort.

A large amount of excitation, without a minimum intensity required and intense excitations with a minimum volume can not promote the adaptation.

The adaptation process flows better, how close to the optimum dosage-dependent body's ability to effort and reward.

The more we move towards the optimal value (lower or higher dosages), the training effect is reduced.

At this age, from the physiological point, all systems and devices are booming, so there is a series of morpho-functional changes of which the most important are the sex.

In addition to the above, those skilled in the art [3, 4, 5, 6] considers that this period is characterized by bone growth in length, muscular system development, development of the larynx at boys. In addition to hereditary factors, an important role plays the environment (food, geo, urbanization).

According to specialists, including [1, p. 24-28] "in terms of cognitive

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development, this stage is defined by the acquisition of cognitive, social and emotional skills that can facilitate the transition to maturity". [7 p. 49] believes that currently appear "strengthening mental skills as complex and abstract content".

From a cognitive standpoint, [2 p. 28-29] highlights that at the 15-16 years old children "auditory perceptions recorded during adolescence have some performance characteristics.

Discrimination sound is full height. This specialist detects that teenagers can begin to act alone "The perceptions in adolescence are present, neurologically-functional and mental conditions for representations will be made very easily".

2. Hypothesis

We started from the premise that if we implementing in the game of volleyball methods that reside from video/biomechanical analysis, we will achieve positive results at the sensor-motor, functional and morphological parameters.

3. Work Tasks:

Following this work we want:

- Literature review on the valence of the tested parameters as new methods
- Assessment of the level of development of parameters: The Quelette nutrition index (IQ), Heart rate, The psychomotor coordination test, The Matorin test, The Romberg test, The Dorgo recovery index, The Ruffier test
- Rationale theoretical and experimental verification of the effectiveness of the proposed

4. Material and Method

The research was conducted in the period August 2013 - June 2014 on a sample group n=15 athletes in the experiment group, CSS Nicu Gane Fălticeni, n=15 athletes in the control group, LPS Piatra Neamţ.

The pedagogical approach was to implement in preparing the experimental group during the experiment, a number of means which have resulted from careful study of experimental group by video/biomechanical means.

The parameters tested in pedagogical approach are:

A. **Heart rate** is the number of myocardial contraction in a given time. The number of contractions recorded in 15 seconds then multiply by 4. The measurements are made using the probe method on the carotid artery or the radial upright.

B. **The test of** psychomotor coordination is very important because in volleyball performance, the coordination is defining in achieving success. The athlete is blindfolded with a scarf which prevents him from seeing. He sits at the end of a long line of 7 meters. The test consists of approaching this line in order to stop exactly at the end of it. At this moment, when he considers it reached the end of the line he stops. The assessor marks an X between the feet of the subject. The assessment test is to measure the distance between X and the end of the line (whether X is before or after the line).

C. **The Matorin test** evaluates the overall coordination and involves

performing a vertical jump, combined with the widest possible rotation around the longitudinal axis of the body. The measurement is made with a ruler and a protractor, and we record the values, in degrees, made in both directions after jumping. It seeks a flight as high possible, keeping balance during landing and feet must be glued when landing.

D. **The Romberg test** aimed at testing the balance. The athlete is standing, with support on one leg, the other leg touches with the heel the knee of the other leg, the arms are stretched forward, parallel to the ground, eyes closed. We measure the time in seconds in which the athlete is in balance on one leg.

E. **The Dorgo recovery index** provides information on heart rate. The calculation of this index is as follows:

P1 - pulse before training

P2 - 1 minute pulse after training

P3 - pulse after 3 minutes after training

P4 - pulse after 5 minutes after trening

The calculation is as follows:

ID = (P1 + P2 + P3 + P4) -200 / 10

F. **The Ruffier test** is based on the development of heart rate. Heart rate was recorded for 15 "and multiply by four. The subject is at rest 5 minutes after that we record the heart rate (FCt0), then running 30 squats in 45 seconds, then again we take the heart rate (FCt1), one minute break, after that, again we take the heart rate (FC t2). Ruffier index calculation (IR) index for assessing the resistance effort is the sum of the three values minus 200 divided by 10.

$$IR = \frac{t_0 + t_1 + t_2 - 200}{10}$$

The methods used in the experiment are: literature review, experimental method, the video/biomechanics analysis method, graphical and tabular method.

5. Research Results

In the early stage of pedagogical approach consisted of initial testing of athletes; results were recorded and compared with those provided by the final testing.

Statistically analyzing the differences between the final testing of the two groups in functional test, "The Quellete Index nutrition test (IQ)", we note that "t" calculated is 2.10, higher than the "t" spreadsheet, P <0, 05 which shows that the differences between the two groups are significant in terms of value, in favor of the experimental group

Statistically interpreting the differences between the final testing of the two groups in terms of functional index “Heart Rate" note that" t "calculated is 2.05, higher than the" t "spreadsheet, P <0.05, which proves that the differences between the two groups are significant, the experimental group obtaining better results, even though the control group achieved good results.

Processing the data from "The psychomotor coordination test", statistically analyzing the differences between the final testing of the two groups, we see that "t" calculated is 2.13, higher than the "t" spreadsheet, P <0, 05 which shows that the differences between the two groups are significant, the experimental group with superior results, despite the good results obtained from the control group at final testing.

Processing the test data provided by "The Matorin test", statistically analyzing

the differences between the final testing of the two groups, we see that "t" calculated is 2.11, higher than the "t" spreadsheet, P <0.05, which shows that the differences between the two groups are significant.

In the functional index testing, "The Romberg test", "statistically interpreting the differences between the final testing of the two groups, we see that" t "calculated is 2.08, higher than the" t "spreadsheet, P <0, 05 which shows that the differences between the two groups are significant experimental group obtaining better results.

Within the "The Dorgo recovery index", statistically interpreting the differences between the final testing of the two groups, we see that "t" calculated is 2.11, higher than the "t" spreadsheet, P <0.05, which shows that the differences between the two groups are significant experimental group obtaining better results.

Table 1

Summary of sensorimotor functional parameters obtained for both groups

№ d/o	The test	Groups and statistics	Statistical indicators			
			Initial $\bar{X} \pm m$	Final $\bar{X} \pm m$	t	P
1	The Quellete nutrition Index (IQ)	M	3,51±0,18	3,82±0,16	1,94	> 0,05
		E	3,68±0,19	4,24±0,12	3,50	< 0,01
		t	0,66	2,10	—	—
		P	> 0,05	< 0,05	—	—
2	Heart rate	M	77,66±1,52	75,13±1,49	1,78	< 0,05
		E	77,26±1,50	70,88±0,44	4,59	< 0,001
		t	0,19	2,05	—	—
		P	> 0,05	< 0,05	—	—
3	Psychomotor coordination test	M	9,88±0,16	9,66±0,15	1,47	< 0,05
		E	9,68±0,18	9,23±0,14	3,00	< 0,01
		t	0,83	2,13	—	—
		P	> 0,05	< 0,05	—	—
4	The Matorin test	M	351,53±2,41	355,00±2,40	0,67	> 0,05
		E	352,66±2,38	362,05±2,33	4,21	< 0,001
		t	0,33	2,11	—	—
		P	> 0,05	< 0,05	—	—
5	The Romberg test	M	15,54±0,30	16,00±0,27	1,70	> 0,05
		E	15,68±0,30	16,73±0,22	4,20	< 0,001
		t	0,33	2,08	—	—
		P	> 0,05	< 0,05	—	—
6	Dorgo recovery index	M	4,44±0,07	4,31±0,07	1,85	> 0,05
		E	4,29±0,08	4,12±0,06	2,43	< 0,05
		t	1,36	2,11	—	—
		P	> 0,05	< 0,05	—	—
7	The Ruffier test	M	9,16±0,22	9,00±0,21	0,80	> 0,05
		E	9,11±0,22	8,42±0,18	3,63	< 0,01
		t	0,16	2,07	—	—
		P	> 0,05	< 0,05	—	—

Caption: E – The experimental group , M – The control group

n= 15;	P -	0,05;	0,01;	0,001.	r = 0,553
f = 28;	t =	2,048	2,763	3,674	
f = 14;	t =	2,145	2,977	4,140	

Processing the data provided by the functional test, "The Ruffier test", we note that, in terms of final testing statistical the of final testing statistical differences between the two groups, we see that "t" calculated is 2.07, higher than the "t" spreadsheet, P <0.01, which shows that the differences between the two groups are significant.

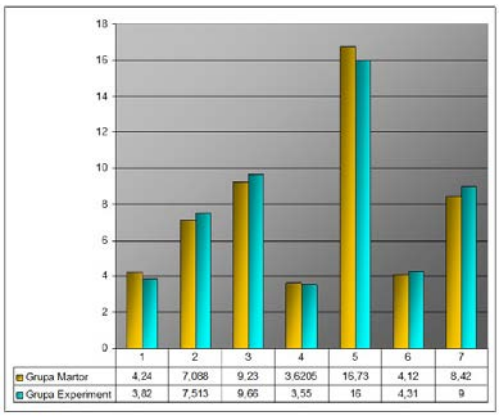

Fig. 1. *Dynamics of average values obtained from tests of sensorimotor and functional parameters*

6. Conclusions

As a result of research it can be concluded that:

• Dynamics of the average values obtained by the two groups varies between initial and final testing.

• At all 7 tests, the values recorded by experimental group are superior to the values obtained by the control group, P <0,05,0,01,0,001.

• Following the results of the experiment group, which are significantly higher than those expected, we find that the contribution of new means (video /biomechanical analysis) led to improved planning the training of the athletes who play volleyball.

• The premise from which we started in future to take account of this in differences between the two groups, we see that "t" calculated is 2.07, higher than the "t" spreadsheet, P <0.01, which shows that the differences between the two groups are significant.

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