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THE MOTOR TRAINING OF SENIOR VOLLEYBALL PLAYERS BY APPLYING THE DATA-VOLLEY PROGRAMME

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Abstract. The problem of training senior volleyball players is a very current one, both in Romania, as well as in the majority of the European states. Nowadays, a series of scientific researches were carried out in which the specialists suggest different experimental methodologies so as to increase the efficiency of the sports training among senior volleyball players. However, there are plenty of reserves in order to increase the quality of the sports training of senior volleyball players. One of the determining factors in the volleyball game is the motor training of the players, decisive factor in winning or losing a game. In this sense, our plan is to put into the practice of training for senior volleyball players the experimental programme called Data-Volley, which comes to prove its efficiency in the motor plan. It was tested both during the sports training, as well as during the official volleyball games within the National Volleyball Championship of Romania, and the results are shown below.

Keywords. volleyball, senior, motor training, Data-Volley experimental programme.

In this research, our aim is to implement Data-Volley into the training process of senior volleyball players, as well as during the official competitions within the National Volleyball Championship in Romania. The content of this programme is described in one of the previously published articles within a scientific conference [1].

It is worth mentioning that during the pedagogic experiment with a duration of one competitional year, several indicators were examined, so as to emphasize the efficiency of applying this programme. Basically, all the factors of the sports training were investigated, and in this article only the motor factor will be analysed, namely the evolution of the parameters of the physical training of senior volleyball players during official games within the National Volleyball Championship in Romania.

All these results, allowed us to draw out the conclusion of the efficiency of applying the suggested experimental programme among senior players and the perspectives of its application in other stages of volleyball-player

training, as well as the extrapolation of the results in other sports games, such as football, basketball, rugby, handball etc.

According to the plan of the foreseen researches for the pedagogical experiment, we were about to point out the efficiency of implementing the Data-Volley experimental programme in the training of senior volleyball players within the National Volleyball Championship through the perspective of the factors of sports training. One of these factors was the motor one, and we were interested in how this compartment evolved depending on the implementation of the Data-Volley experimental programme throughout one year of training and evaluation in the competitions of the National Championship of Male Volleyball in Romania.

At the level of performance, the purpose of coaches is not necessarily that of increasing considerably the level of physical training, the main objective being to maintain the best physical preparation throughout the entire time of a competitional season, particularly during the competitional period [3, 5]. Thus, the level

of motor training will influence to a great extent the quality of execution of the elements and technical game procedures, but also the capacity to observe tactical indications, in a certain game situation or throughout its time. [2, 4, 6, 7].

Implementing the above-mentioned experimental programme, we were especially interested in the evolution of the basic motor parameters throughout the pedagogical experiment. In this sense, at the beginning and the end of the experiment, six basic indicators were assessed, which actually represent all the necessary motor qualities for volleyball players in the unfolding of volleyball games, these being: running 2 x 10m, test which represents the speed specific for volleyball players; moving with a change of direction between five cones, a test to asses the skills when speeding; raising the torso from a laid-down position in thirty seconds, a test to assess the strength of the abdominal muscles; the vertical jump, test to assess the detent of the players; bending forward from a sitting position, test to assess the level of suppleness development; and the test to assess the functional condition of the entire body (the Burpee Test). All these tests were performed both at the beginning, as well as the end of the pedagogical experiment, for both teams, we are talking about C.S. Arcada Galați, representing the experimental group, where the experimental programme was used and the team of Steaua București. The results were recorded, statistically processed and are shown in Table 1 and in Figures 1-6.

Table 1. Indicators of the motor training of senior volleyball players within the formative experiment

No.	MOTOR TESTS		T.I. $X1 \pm m_1$	T.F. $X2 \pm m_2$	t	P
1	Running 2x10m, s	CG	4.41$\pm$ 0.07	4.39$\pm$ 0.07	0.28	P>0.05
		EG	4.43$\pm$ 0.09	4.14$\pm$ 0.08	2.42	P<0.05
			t=0.18; P>0.05	t=2.27; P<0.05		
2	Moving with change of direction between 5 cones, s	CG	10.63$\pm$ 0.15	10.51$\pm$ 0.16	0.80	P>0.05
		EG	10.59$\pm$ 0.17	10.03$\pm$ 0.15	3.73	P<0.01
			t=0.17; P>0.05	t=2.18; P>0.05		
3	Raising the torso from laid-down position in 30s, rep. no.	CG	42.13$\pm$1.07	43.37$\pm$ 1.06	1.21	P>0.05
		EG	42.69$\pm$ 1.08	46.44$\pm$ 1.05	3.68	P<0.01
			t=0.37; P>0.05	t=2.05; P<0.05		
4	Vertical jump, cm	CG	35.22$\pm$ 0.84	36.33$\pm$ 0.80	1.42	P>0.05
		EG	35.88$\pm$ 0.86	38.73$\pm$ 0.78	3.61	P<0.01
			t=0.14; P>0.05	t=2.14; P<0.01		
5	Bending forward from sitting position, cm	CG	11.87$\pm$ 0.61	12.40$\pm$ 0.60	0.91	P>0.05
		EG	11.98$\pm$ 0.62	14.17$\pm$ 0.58	3.84	P<0.01
			t=0.13; P>0.05	t=2.13; P<0.05		
6	Force when speeding (Burpee Test), rep. no.	CG	12.72$\pm$ 0.63	13.28$\pm$ 0.60	0.95	P>0.05
		EG	12.90$\pm$ 0.65	15.16$\pm$ 0.59	3.83	P<0.01
			t=0.20; P>0.05	t=2.24; P<0.05		

Note: n=18   P - 0.05   0.01   0.001
        f= 17   t = 2.110   2.898   3.965   r – 0.544
   f= 34   t = 2.032   2.728   3.601

The first indicator that was subjected to pedagogical analysis was the test proving the evolution of the motor quality speed, a quite important quality in the volleyball game,

including at the level of seniors. In the given case, there was used the test "Speed running 2x10 metres", this being a speed test, specific for volleyball players, being also recommended by the Romanian Volleyball Federation (Table 1, Figure 1).

Analysing the test which represents the capacity of developing the speed that is specific for senior volleyball players (Figure 1)

shuttle run 2x10 metres, we notice that the initial indicators in both groups are approximately equal, ranging between 4.41 and 4.43 seconds. This thing proves the homogeneity of the groups included in the pedagogical experiment, both groups scoring almost equal values. Which is proved by the statistical calculus at the initial testing between the two groups (P>0.05).
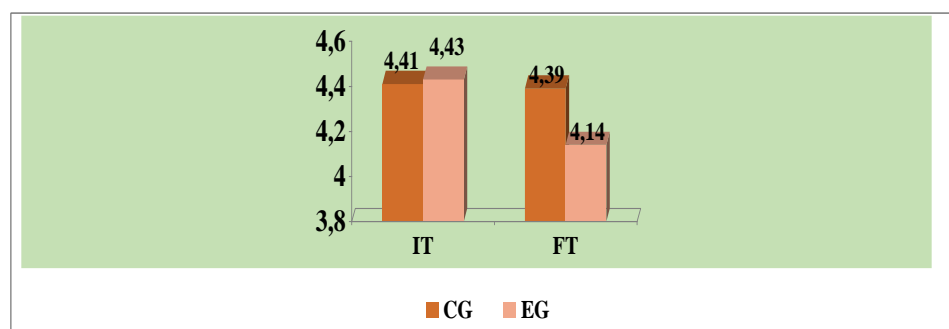

Fig.1. Results of the speed test (2x10 m)

After one year of training using mainly the Data Volley experimental programme, the results to this test have evolved differently. We should mention that both groups recorded significant increases to the final testing (P<0.05), however, the experimental group had a much more defined increase, the difference between the initial and the final testing being of approximately 0.27 seconds. Consequently, at the beginning of the experiment, the experimental group recorded a result equal to 4.43 seconds, and in the end, it recorded 4.14 seconds. It might seem that the difference is not that large, but for the speed test, such an increase can be considered quite large, as proved also by the statistical calculus (P<0.05).

Also here, we can notice that the speed test is considered as fairly conservative, being difficult enough to significantly develop it, even by applying different experimental methodologies suggested by the specialists in the field. That is why an increase of only 0.2 seconds for a distance of 20 metres is considered a significant increase at this level of performance.

Another motor test which was subjected to our research was the test of "Moving with change of direction between five cones" (Figure 2), this representing the level of specific skill when speeding for volleyball players.

Just like in the previous case, at the initial testing, both groups qualified under the limits of the results of 10.63 seconds the control group and 10.51 seconds the experimental group, meaning the groups were homogenous also at this indicator (P>0.05). Analysing the results recorded at the end of the pedagogical experiment, we notice an absolutely non-homogenous dynamic in both groups participating in this experiment. Thus, the control group improved its performance at this indicator with only 0.12 seconds, reaching from 10.63 seconds to 10.51 seconds, recording an insignificant increase from a statistical point of view (P>0.05). Analysing the results recorded by the experimental group, we notice that at the end of the pedagogical experiment, it recorded a significant increase from a statistical point of view (P<0.05), reaching to a result equal to 10.03 seconds, as compared to 10.59 seconds in the initial testing.
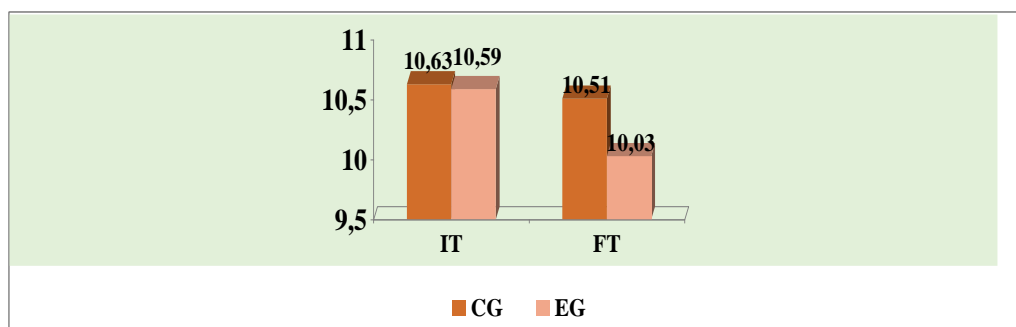
Fig. 2. Results of the test of moving with change of direction between five cones

Therefore, even at this indicator, the volleyball players in the experimental group had a better evolution compared to those in the control group, which speaks us clearly about the efficiency of applying the Data Volley experimental programme, in the current case to the motor plan.

The next test applied to senior volleyball players within the pedagogical experiment was that of "raising the torso from a laid-down position in 30 seconds" (Figure 3).
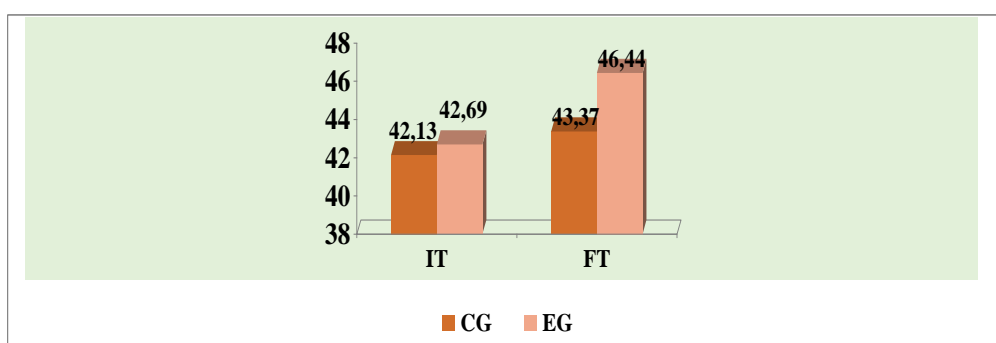
Fig. 3. Results of the test of raising the torso from laid down position in 30 seconds

This test represents the level of development of the abdominal strength of volleyball players, which is part of the tests to check the level of motor training in volleyball players, also suggested by the Romanian Volleyball Federation.

Analysing the results of the initial test of the volleyball players listed in the pedagogical experiment, we notice that both groups recorded approximately equal results, where the control group had a performance of 42.13 raises of the torso, whereas the experimental group 42.69 raises. The statistical calculus proved that the groups are homogenous also at this indicator (P>0.05), meaning there is no significant difference between the two results.

From applying the experimental programme at the end of the pedagogical experiment, between the experimental team and the control team, there were recorded different increases of the results for this test. For example, the control group recorded an increase of 1.24 raises of the torso, this representing an insignificant raise from a statistical point of view (P>0.05). The final results at the experimental group (46.44 raises) were much higher as compared to the initial ones (42.69 raises), whereas the statistical calculus showed a significant increase from their statistical point of view (P<0.01), which once again highlighted the efficiency of applying the

experimental process in the process of training of senior volleyball players.

The next test was "the Vertical Jump" (Figure 4), test for assessing the strength when speeding of the lower limbs, this representing the level of development for the explosive force of volleyball players.
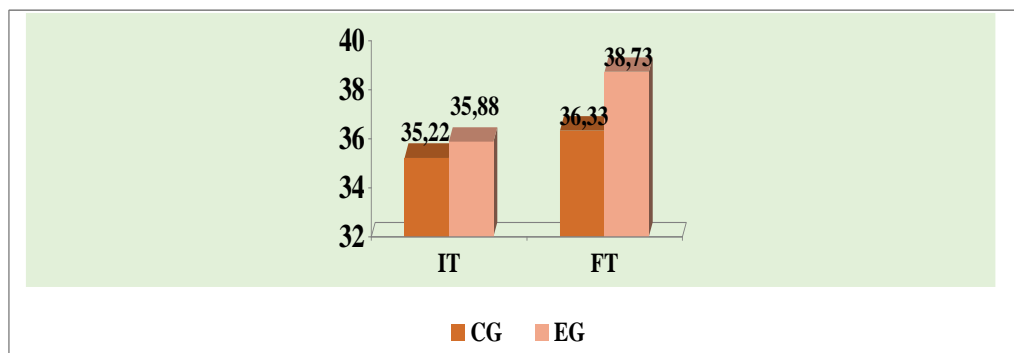
*Fig. 4. Results of the vertical jump test*

It is proved the fact that in the volleyball game, at any level, there are specific the multiple jumps executed by players during a game or practice. Their number reaches up to three-four hundreds in a game, which is why in the volleyball game, including at the level of seniors, it is very important to study the evolution of the detent.

Examining the evolution of the detent of senior volleyball players, it was proved that according to the initial analysis of indicators, the groups were homogenous according to their level of training on this compartment. At the beginning of the pedagogical experiment, the control group recorded a result of 35.22 centimetres, whereas the experimental group 35.88 centimetres and according to the statistical calculus, the difference between them is insignificant (P>0.05). At the end of the pedagogical experiment, the results of both group suffered significant changes, especially the experimental group, which at the beginning had recorded an average score of the standing jump equal to 35.88 centimetres, and at the end, this result increased up to 38.73 centimetres, meaning on average, this increased to almost six centimetres. The statistical calculus proved a significant increase from a statistical point of view (P<0.01) for the given group. But this thing was not valid also for the control group, where the final result increased as compared to the initial one with only 1.11 centimetres and it had an insignificant nature from a statistical point of view (P>0.05). Therefore, in the current case, it was clearly proved the efficiency of applying the experimental programme in the process of sports training of senior volleyball players.

The joint mobility is also quite an important indicator for volleyball players in all levels of training. In this case, at the senior level, emphasis is placed more on maintaining mobility than on its development, because the sensitive development period of this motor quality is far apart from seniority, this being characteristic for the age of 5-7 years.

Therefore, this motor quality was subjected to our research according to the research plan, and the test that comes to prove this thing is "Bending forward from a sitting position" (Figure 5).
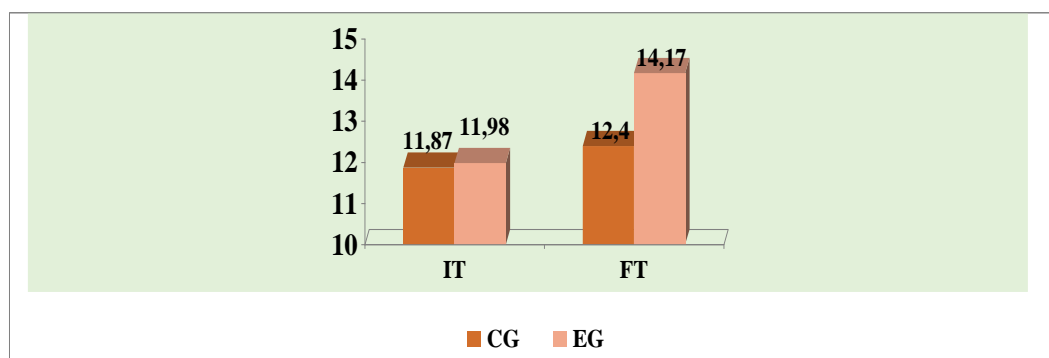
Fig. 5. Results of the bending forward from sitting position test

According to the recorded results, at the beginning of the experiment, meaning in the initial stage, the groups were homogenous, as turns out from statistical calculus (P>0.05), which allowed us to compare the performances of these groups involved in the formative pedagogical experiment. At the initial testing, the control group recorded a result equivalent to 11.87 centimetres, whereas the experimental group to 12.40 centimetres, these being quite good for this level.
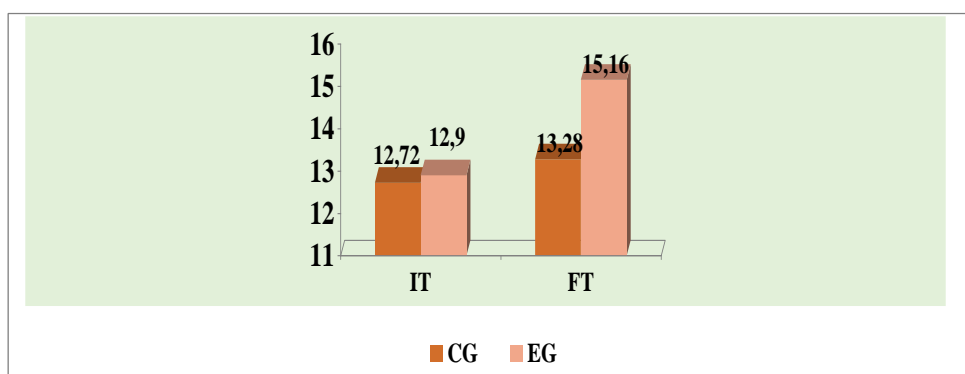
At the end of the pedagogical experiment, meaning at the final testing, the dynamic of results was fairly non-uniform, although both groups made quite a lot of progress at this indicator, although the experimental group stood out scoring obviously better results. Thus, at the end of the basic experiment, the experimental group reached medium values of 14.17 centimetres, as compared to 11.98 centimetres at the beginning, the difference being significant from a statistical point of view (P<0.01). The control group at the end of the formative experiment recorded an average of 12.40 centimetres, as compared to 11.87 centimetres at the beginning of the experiment, scoring an insignificant increase from a statistical point of view. (P>0.05).

The last indicator of the motor tests which was subjected to research was the "Burpee Test", which comes to assess the functional condition of the entire body (the strength of the upper limbs, the strength of the lower limbs, but also that of the abdominal muscles) (Figure 6). Like in the majority of the previous cases at the beginning of the pedagogical

experiment, both groups had approximately the same level of motor development, the control groups recorded a result equivalent to 12.72 repetitions, whereas the experimental group to 12.90 repetitions. The statistical calculus proved that the difference between the two measurements is insignificant from a statistical point of view (P>0.05), meaning the groups were homogenous at this parameter.

This being a test that assesses the level of physical training specific for senior volleyball players, the results of the players in both teams at the end of the formative experiment increased essentially. Thus, at the beginning of the experiment, the control group scored a result equivalent to 12.72 repetitions, whereas at the end it was of 13.28 repetitions, the difference being an insignificant one from a statistical point of view (P>0.05). Approximately the same tendency is also recorded in the experimental group, which at the beginning of the experiment recorded a result equal to an average of 12.90 repetitions, whereas at the end, the average score was of 15.16 repetitions. Unlike the control group, the difference between the initial results and the final ones is a significant one from a statistical point of view at a higher verity threshold (P<0.01). This thing also confirms to us the fact that the application of the experimental programme for the respective group had a beneficial effect on improving the results that relate to the muscles of the upper limbs, of the lower limbs, but also of the strength of the abdominal muscles.

Fig. 6. Results of the Burpee Test

Thus, analysing the evolution of the indicators of motor training with senior volleyball players included in the pedagogical experiment, it was proved the fact that the applied experimental programme had a positive effect in this sense, where the experimental group basically improved all the tested indicators on this compartment. If we were to analyse the evolution of all the tested indicators, we notice that the best increase of the results was recorded in the parameters relating to the strength test and the strength when speeding test. Also fairly good were the results in the skill tests and strength when speeding, tests that are specific for the volleyball game. A visible increase, but less noticeable by comparison to others was recorded in the case of the speeding tests which, according to the data of the specialty literature are more conservative and more difficult to solve at the level of seniors.

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