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ASPECTS CONCERNING THE ANALYSIS OF THE FUNCTIONAL PARAMETERS AT F.C.M. DUNAREA GALATI TEAM

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Abstract: *In this research we used series of tests designed to determine the physical skills of the footballers and to assess the functional capacity of the organs involved in the performance of this sport. This paper reflectes the values concerning the blood pressure, the respiratory rate, the vital capacity, Lorentz index, Ruffier test and Sargent test.*

Key words: *Ruffier test, Sargent test, Lorentz index.*

INTRODUCTION

This paper reflects the assessing of the functional parameters concerning the footballers of F.C.M. Dunarea Galati team (17 to 18 years of age).

In assessing the cardiovascular system, it is subjected to simple exercise tests, Ruffier test which involves performing a 30-extensions leg curls in 45 seconds. These tests allow to observe variations in heart rate and blood pressure. Ruffier test is called fitness assessment test.

Sargent test or jump-test is a classic test for assessing anaerobic power developed in the case of the effort made with the muscles of the inferior limbs.

MATERIALS AND METHODS

In the aim of the achievement concerning this paper we used the next research methods: the scientifical documentation, the statistical method, the observation method.

In this research, we presented the next functional parameters concerning the footballers (17 to 18 years of age) of F.C.M. Dunarea team:

- blood pressure;
- respiratory rate;
- vital capacity;
- Lorentz index;
- heart rate;
- Ruffier test;
- Sargent test.

RESEARCH RESULTS

If we look in the table no. 1, we observe:

- *"Blood pressure - down"* has a final average for maximum of 115 and 55 for minimum, lower than the initial average for maximum of 120 and 60 for minimum. The reduction was 5 for maximum and 5 for minimum Initially, each footballer it deviates with ± 12,47, respectively with ± 6,97 compared to initial average for maximum, respectively for minimum, and finally each footballer it departs with ± 10,73, respectively ± 6,77 compared to the final average for maximum, respectively for minimum.

The final variation of 9,33 % for maximum and 12,31 % for minimum is lower, respectively higher than the initial variation of 10,39 % for maximum and 11,61 % for minimum.

The calculation of the significant difference between the final and initial average of the maximum, respectively minimum it expresses

by $|t_{calculated}| = |-1,25| = 1,25 < t_{tabelated} = t_{0,05;34} = 2,03$

, respectively $|t_{calculated}| = |-2,12| = 2,12 > t_{tabelated} = t_{0,05;34} = 2,03$

. We observe that, between the final average and initial average for maximum is not a significant difference, and between the final and initial average for minimum there is a significant difference.

- *"Blood pressure - after standard exercise"* has a final average for maximum of 135 and 65 for minimum, lower than the initial average for maximum of 140 and 70 for minimum 70. The decrease was 5 for maximum and 5 for minimum. Initially, each player it deviates with ± 12,58, respectively with ± 7,16 compared to the initial average for maximum, respectively for minimum, and finally each player it diverges by ± 8,81,respectively ± 5,13 compared to the final average for maximum, respectively for minimum.

The final coefficient of variation has the value of 6.52 % for maximum and 7,89 % for minimum. He is lower than the initially coefficient of variation which has the value of 8.98 % for maximum and 10,22 % for minimum. So, we observe an increase concerning the homogeneity of the team.

If we calculate the significance of the difference between the final and initial average of the maximum, respectively minimum, we obtain $|t_{calculated}| = |-1,34| = 1,34 < t_{tabelated} = t_{0,05;34} = 2,03$

, respectively $|t_{calculated}| = |-2,34| = 2,34 > t_{tabelated} = t_{0,05;34} = 2,03.$

Thus, we observe that, between the final average and initial average, concerning the maximum, is not a significant difference, while between the final average and initial average for minimum there is a significant difference.

Table no.1

Statistical indicator / Indicators tested			INITIAL			FINAL			t	p
			Arithmetical average $\bar{x}_1 \pm EM_1$	Standard deviation σ_1	Coefficient of variation v_1 (%)	Arithmetical average $\bar{x}_2 \pm EM_2$	Standard deviation σ_2	Coefficient of variation v_2 (%)		
BLOOD PRESSURE	down	max	120 ± 2,94	12,47	10,39 %	114,72 ≈ 115 ± 2,53	10,73	9,33 %	-1,25	0,05
		min.	58,05 ≈ 60 ± 1,64	6,97	11,61 %	57,5 ≈ 55 ± 1,59	6,77	12,31%	-2,12	0,05
	after standard exercise	max	140 ± 2,96	12,58	8,98 %	134,44 ≈ 135 ± 2,07	8,81	6,52 %	-1,34	0,05
		min.	68,05 ≈ 70 ± 1,68	7,16	10,22 %	67,5 ≈ 65 ± 1,21	5,13	7,89 %	-2,34	0,05
	down	max	130 ± 2,96	12,58	9,67 %	123 ≈ 125 ± 2,27	9,64	7,71 %	-1,30	0,05
		min.	62,77 ≈ 65 ± 1,79	7,63	11,73 %	62,77 ≈ 60 ± 1,24	5,27	8,78 %	-2,22	0,05
RESPIR A-TORY RATE	(resp/min)		16,61 ± 0,21	0,89	5,35 %	15,77 ± 0,16	0,71	4,50 %	-3,05	0,05
VITAL CAPACI TY	(cm^3)		4669,44 ± 12,51	53,07	1,13 %	5019,44 ± 12,51	53,07	1,05 %	19,22	0,05
LOREN TZ INDEX (CV/T)			26,28 ± 0,08	0,35	1,33 %	27,83 ± 0,07	0,31	1,11 %	13,48	0,05
HEART RATE	P_1 = pulse before effort on 15 seconds		20,22 ± 0,28	1,22	6,03 %	19,33 ± 0,24	1,05	5,43 %	-2,34	0,05
	P_2 = pulse after 30 squats on the first 15 seconds		30,22 ± 0,28	1,22	4,03 %	29,22 ± 0,28	1,22	4,17 %	-2,44	0,05

	P_3 = pulse after 30 seconds from p_2 on the first 15 seconds	28,22 ± 0,28	1,22	4,32 %	27,22 ± 0,28	1,22	4,48 %	-2,44	0,05
RUFFIER TEST		-2,13 ± 0,08	0,37	-3,05 %	-2,42 ± 0,08	0,34	-2,74 %	-2,41	0,05
SERGENT TEST		128 ± 1,88	8	6,25 %	142,7 ± 1,68	7,16	5,01 %	5,64	0,05

- *"Blood pressure - down"* has a final average for maximum of 125 and 60 for minimum, lower than the initial average for maximum of 130 and 65 for minimum. The reduction was 5 for maximum and 5 for minimum.

Initially, each footballer it deviates with ± 12,58, respectively ± 7,63, compared to the final average for maximum, respectively for minimum, while finally each player it deviates with ± 9,64, respectively ± 5,27, compared to the final for maximum, respectively for minimum.

The final coefficient of variation for maximum has the value of 7,71 % and 8,78 % for minimum. He is lower than the initially coefficient of variation which has the value of 9,67 % for maximum and 11,73 % for minimum. In this case, we observe an increase concerning the homogeneity of the team.

Concerning the significance of the difference between the final and initial average of the maximum, respectively minimum, we obtain

$$|t_{calculated}| = |-1,30| = 1,30 < t_{tabelated} = t_{0,05;34} = 2,03$$

,

respectively

$$|t_{calculated}| = |-2,22| = 2,22 > t_{tabelated} = t_{0,05;34} = 2,03$$

. So, we observe that, between the final average and initial average, concerning the maximum, is not a significant difference, while between the final average and initial average for minimum there is a significant difference.

- *"Respiratory rate*" has a final average of 15,77 resp / min., lower than the initial average of 16,61 resp / min., the reduction being 0,84 resp / min.

Initially, each footballer it deviates with ± 0,89 face of the initial average of the respiratory rate. Finally, each player deviates by ± 0,71 compared to the final average of the respiratory rate.

The final coefficient of variation of 4,5 % is lower than the initial coefficient of variation of 5,35 %, which means an increase in homogeneity for F.C.M. Dunarea Galati team.

The calculation concerning the significance of the difference between the final average and initial average for the respiratory rate is expressed by

$$|t_{calculated}| = |-3,05| = 3,05 > t_{tabelated} = t_{0,05;34} = 2,03$$

. The difference between the final average and initial average is significant.

- *"Vital capacity*" has a final average of 5019,44 cm^3 higher than the initial average of 4669.44 cm^3, the growth being with 350 cm^3. Each player deviates with ± 53.07 cm^3 compared to the initial average and final average concerning the vital capacity.

The final coefficient of variation of 1.05 % is lower than the initial coefficient of variation of 1,13%, which means an increase in homogeneity for F.C.M. Dunarea team.

If we calculate the significance of the difference between the final and initial average for the vital capacity, we observe that

$$|t_{calculated}| = |-3,05| = 3,05 > t_{tabelated} = t_{0,05;34} = 2,03$$

, which it is expresses that the difference between the final average and initial average is significant.

- "Lorentz index" has a final average of 27,83 cm3/cm higher than the initial average of 26.28 cm3/cm, the growth being with 1,55 cm3/cm, and according to the grid with values over 25 it is considered "very good." Initially, each player deviates with ± 0,35 cm3/cm from the initial average of Lorentz index, and finally it deviates with ± 0.31 cm3/cm face to the final average of Lorentz index.

Final coefficient of variation of 1,11% is lower than the initial coefficient of variation of 1.13%, which it expresses an increase of the homogeneity for F.C.M. Dunarea Galati team.

The calculation concerning the significance of the difference between the final average and initial average for Lorentz index it is expresses through

$$|t_{calculated}| = |13,48| = 13,48 > t_{tabelated} = t_{0,05;34} = 2,03$$

. So, between final average and initial average of Lorentz index there is a significant difference.

- *"Heart rate - P1 = pulse before effort on 15 seconds*" has a final average of 19,33 heart beats /15 seconds lower than the initial average of 20,22 heart beats/15 sec. The decrease was with 0,89 heart beats/15 sec.

Initially, every footballer deviates with ± 1.22 heart beats/15 seconds from the initial average of the pulse, while finally it deviates with ± 1.05 heart beats/15 seconds from the final average of the pulse.

The final coefficient of variation of 5,43 % is lower than the initial coefficient of variation of 6,03 %, which it expresses an increase of the homogeneity for F.C.M. Dunarea Galati team.

The calculation of the significance concerning the difference between the final and initial average for heart rate is expresses through $|t_{calculated}| = |-2,34| = 2,34 > t_{tabelated} = t_{0,05;34} = 2,03$. Thus, the difference between the final average and initial average is significant.

- "*Heart rate - P2 = pulse after 30 squats on the first 15 seconds"* has a final average of 29,22 heart beats/15 seconds lower than the initial average initial of 30,22 heart beats/15 seconds. The reduction was with 1 heart beat/15 seconds.

Each player deviates with ± 1,22 heart beats/15 seconds from the initial average and final average of the pulse. The final coefficient of variation has the value of 4,17 % higher than the initial coefficient of variation of 4,03%, which it means an increase of the heterogeneity concerning F.C.M. Dunarea Galati team.

If we calculate the significance of the difference between the final average and initial average concerning the heart rate, we observe that $|t_{calculated}| = |-2,44| = 2,44 > t_{tabelated} = t_{0,05;34} = 2,03$. So, between the final average and initial average there is a significant difference.

- *"Heart rate - P3 = pulse after 30 seconds from P2, on the first 15 seconds"* has a final average of 27,22 heart beats/15 seconds lower than the initial average of 28,22 heart beats/15 seconds. The decrease was with 1 heart beat/15 seconds.

Each footballer it deviates with ± 1,22 heart beats/15 seconds from the initial and final average of the pulse. The final coefficient of variation of 4,48% is higher than the initial coefficient of variation of 4,32%, which it expresses an increase of the heterogeneity for F.C.M. Dunarea Galati team.

The calculation concerning the significance of the difference between the final and initial average of the heart rate it expresses through $|t_{calculated}| = |-2,44| = 2,44 > t_{tabelated} = t_{0,05;34} = 2,03$. So, the difference between the final average and initial average is significant.

- *"Ruffier test"* has a final average of -12,42 and -12,13 initial average, the change being with 0,29 and according to the grid, because he has negative values the footballers of F.C.M. Dunarea Galati team have a capacity of effort "very good".

Initially, every footballer deviates with ± 0,37 face of the initial test, while finally deviates with ± 0,34 from the final average of the test.

The final coefficient final variation of -2,74% is higher face of the initial coefficient of variation of 3,05%, which it expresses an increase of the heterogeneity of F.C.M. Dunarea team.

The calculation of the significance concerning the difference between the final and initial average of the test is expressed through $|t_{calculat}| = |-2,41| = 2,41 > t_{tabelat} = t_{0,05;34} = 2,03$, the difference between the final average and initial average of the test is significant.

"*Sergeant test"* has a final average of 142,7 higher than the initial of 128, the increase being of 14,7, and according to the grid he has values between 113 and 149. So, the footballers of F.C.M. Dunarea team have a maximum anaerobic power which is satisfactory (Dragan A., 2009).

Initially, each footballer it deviates with ± 8 from the initial test, while finally it diverges with ± 7,16 face of the final average of the test.

The final coefficient of variation of 5,01% is lower face of the initial coefficient of variation with value of 6.25%, which it expresses an increased concerning the homogeneity of F.C.M. Dunarea team.

If we calculate the significance of the difference between the final average final and initial average of the test, we observe that $|t_{calculat}| = |5,64| = 5,64 > t_{tabelat} = t_{0,05;34} = 2,03$, which it reflects that the difference between the final average and initial average is significant.

CONCLUSIONS

- According to Ruffier test, the footballers of F.C.M. Dunarea team have a very good capacity of effort
- If we observe the values of Seargeant test, the footballers of F.C.M. Dunarea team have a maximum anaerobic power which is satisfactory.

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