

## **STUDY ON THE DEVELOPMENT OF MOTOR SKILLS IN RURAL AREAS AT SECONDARY SCHOOL LEVEL**

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**Keywords:** *motor skills, rural environment, development, secondary school level*

**Abstract:** The experiment consisted in using 65 means distributed on each motor quality (speed - 20 means, skill - 15 means, endurance - 20 means and strength - 15 means) separately for 10 months, with a distribution of 1200 cumulative minutes on each motor quality.

### **Introduction**

In today's world, where television, computers, environmental factors, diet and sedentary lifestyles are becoming more and more important in children's lives, it is increasingly necessary to use physical exercise, games of all kinds and movement in general as a preventive, relaxing and recreational process, which are becoming more and more topical. The development of motor skills during physical education and sport lessons is highlighted by the fact that it is only within the framework of this subject in the curriculum that the task of physical development and training is carried out, and a balance is achieved between physical and intellectual effort, an important relationship in the normal growth and development of pupils. [2,6]

Strengthening health, strengthening the body of students, combating sedentarism through physical education and sport are prerequisites for the favorable development of activities at optimal parameters in other subjects in the curriculum. [3,4,5]

### **Material and method**

The starting point in formulating the hypotheses of the paper is centered on the content of the training of pupils aged 10-14 years, which is based on the knowledge of general requirements, characteristic biological traits, the level of development of motor and sports skills and qualities, the level of knowledge and their mental qualities. [7,8,10]

The aim of this work is to verify the practical-experimental verification, through specific means and methods, of the motor skills of 10-14 year old students. The research was carried out from September 2022 to June 2023, and the sample consisted of 156 rural secondary school pupils aged 12 - 14 years.

The experiment was conducted over a period of 10 months, i.e. 40 weeks and a total of 80 hours (4800 minutes). Cumulatively for the four motor skills, a total of

65 means were used during the physical education classes in different forms. For the motor quality speed and its forms of manifestation 20 means were used, and for the motor quality skill 15 means were used. Cumulatively as total workload 1200 minutes were performed during the 10 months of the experiment for both speed and skill. [2,3,4]

For general strength motor quality 20 means were used and for strength motor quality 15 means. Cumulatively as total workload 1200 minutes were performed during the 10 months of the experiment for both endurance and strength. [8,9]

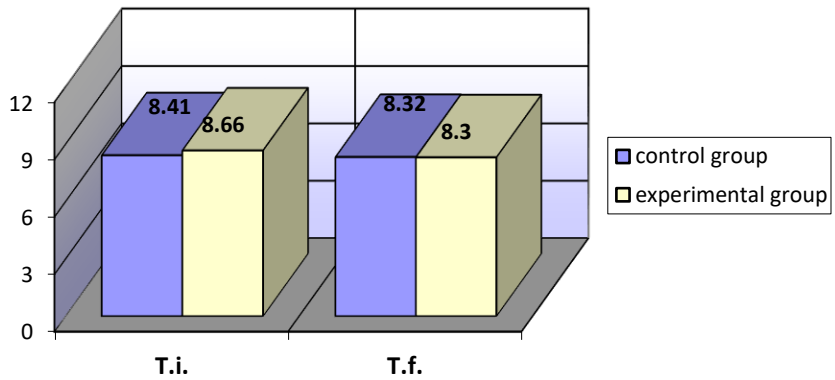
The control samples used in the experiment were as follows:

- 50 m sprint with top start (seconds)
- push-ups (number of repetitions)
- squats (number of repetitions)
- trunk lift from supine (number of repetitions)
- trunk extension from facial recumbency (number of repetitions)
- 800m endurance run - girls and 1000m - boys (minutes and seconds)

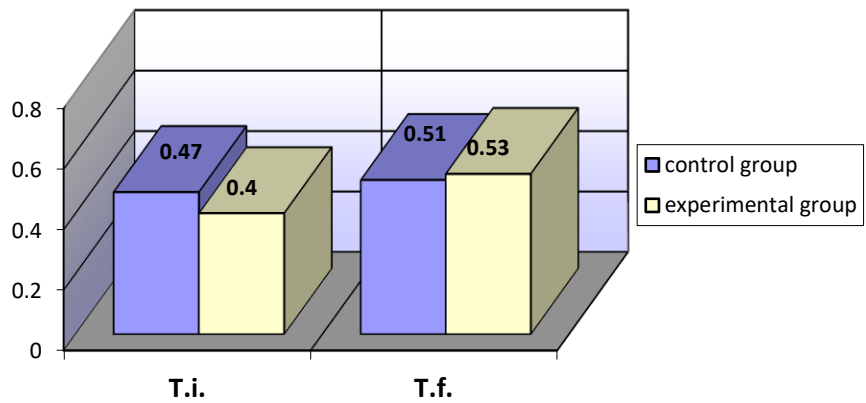
## Results

**Table 1 - 50m sprint, standing start**

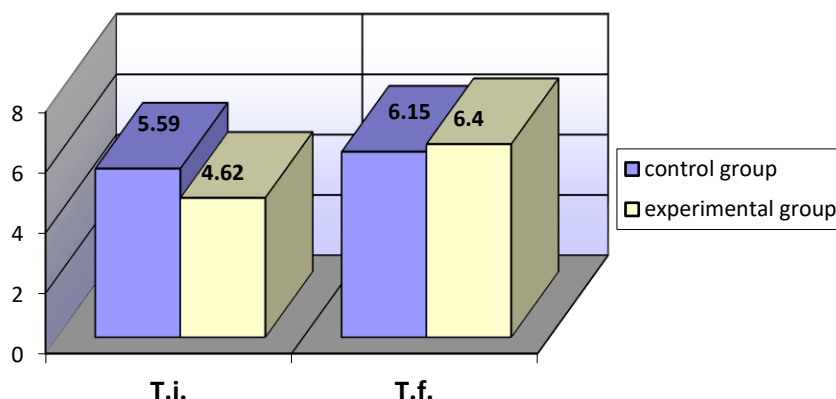
<b>Crt. no.</b>	<b>Statistical indicators</b>	<b>Groups of subjects</b>	<b>Initial testing</b>	<b>Final testing</b>
<b>1.</b>	Arithmetic mean	Experimental group	8,66	8,30
		Witness group	8,41	8,32
<b>2.</b>	Standard deviation	Experimental group	0,40	0,53
		Witness group	0,47	0,51
<b>3.</b>	Coefficient of variability	Experimental group	4,62	6,40
		Witness group	5,59	6,15



**Fig. 1-** Graphical representation of the 50m sprint,  
standing start - *arithmetic mean*



**Fig. 2-** Graphic representation of the 50m sprint,  
standing start - *standard deviation*



**Fig. 3- Graphical representation of the 50m sprint,  
with a standing start - coefficient of variability**

Analysing the centralising table no. 1 and figures 1, 2 and 3 it can be seen that in the test analysed we observe an improvement in performance in the two tests, initial and final, for the two groups involved in the experiment. [1]

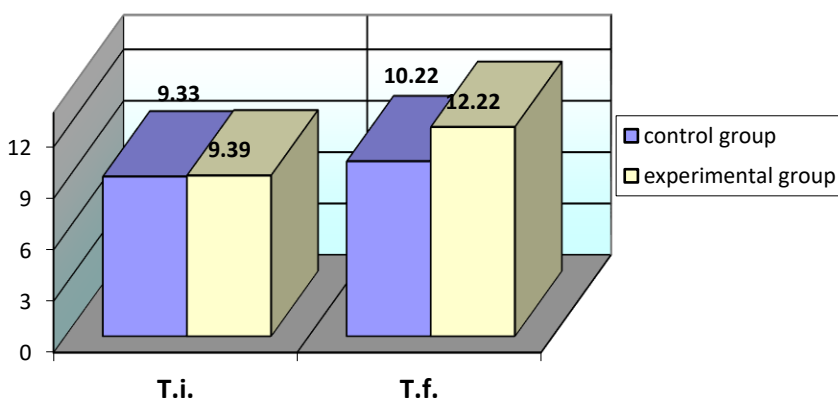
The arithmetic mean at the initial test for the control group is 8.41 and 8.66 for the experimental group, and at the final test, for the control group we find the value of 8.32 - a decrease in time of 0.09 seconds - 1.08%, compared to 8.30 for the experimental group, a decrease of 0.36 seconds - 4.33% for the experimental group. From this analysis we can say that the time obtained by the experimental group in the final test is improved compared to the time obtained by the control group in the final test.

The standard deviation for the experimental group at the initial test is 0.40 and at the final test it is 0.53, compared to the coefficients obtained by the control group at the initial and final tests: 0.47 and 0.51 respectively. The values obtained are small, which shows that we have a small dispersion compared to the mean values.

In the case of the coefficient of variability, we can say that we have a high homogeneity for the two groups, both at the initial test 5.59 - control group and 4.62 - experimental group, and at the final test 6.15 - control group and 6.40 for the experimental group.

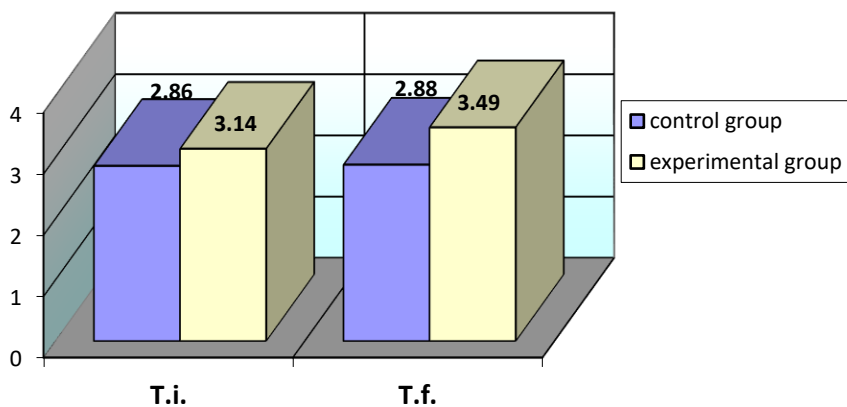
**Table 2 - floats**

Crt. no.	Statistical indicators	Groups of subjects	Initial testing	Final testing
1.	Arithmetic mean	Experimental group	9,39	12,22
		Witness group	9,33	10,22
2.	Standard deviation	Experimental group	3,14	3,49
		Witness group	2,86	2,88
3.	Coefficient of variability	Experimental group	33,50	28,56
		Witness group	30,75	28,19

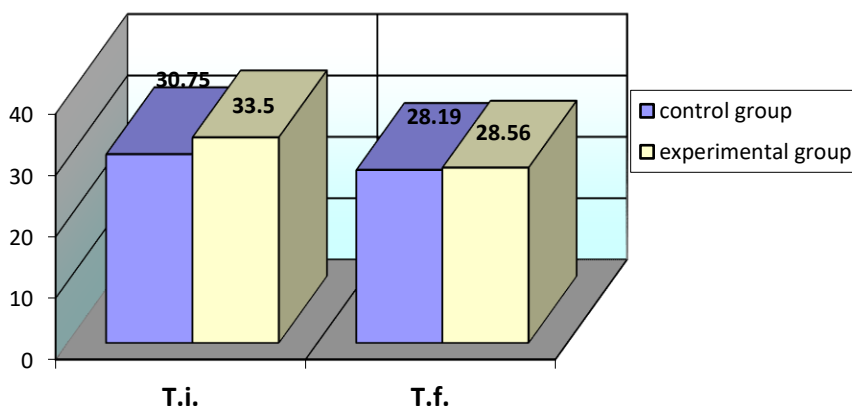


**Fig. 4- Graphical representation - floats**

*- arithmetic mean*



**Fig. 5- Graphical representation - floats - standard deviation**



**Fig. 6- Graphical representation - floats - coefficient of variability**

The statistical analysis of the data obtained in this sample and presented in Table 2 and in the graphical representation of Fig. 4,5 and 6, indicate that the arithmetic mean of the experiment group in the initial test is 9.39 and 9.33 in the control group, while in the final test the experiment group scores 12.22 compared to 10.22 in the control group. We can observe a rather small increase for the control group between the two tests, on average 0.89 push-ups, while in the experiment class we have a larger increase, on average 2.83 push-ups.

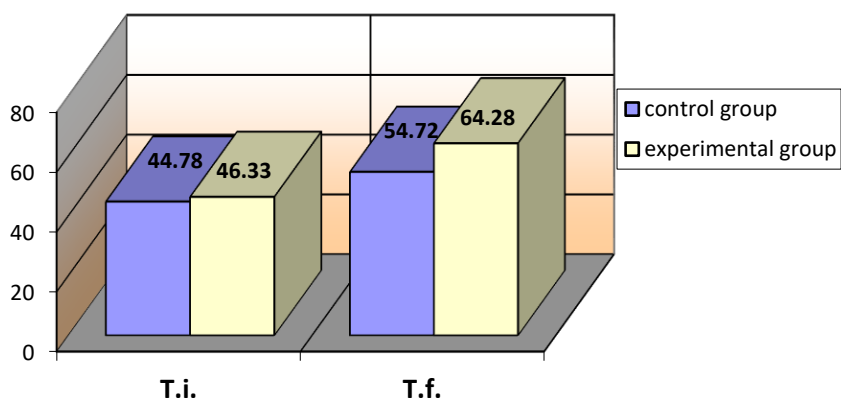
The standard deviation of the experiment class for the initial test is 3.14 and for the final test it is 3.49, compared to the control class which is 30.75 and 28.19 for the initial and final tests respectively. The values being small within this statistical indicator indicate a small dispersion from the mean.

The coefficient of variability shows that for the two groups involved in the experiment, at the initial test: 30.75 - in the control group and 33.50, for the experiment group we have a high spread and a moderate spread for both groups at the final test: 28.19 - control group and 28.56 - experiment group.

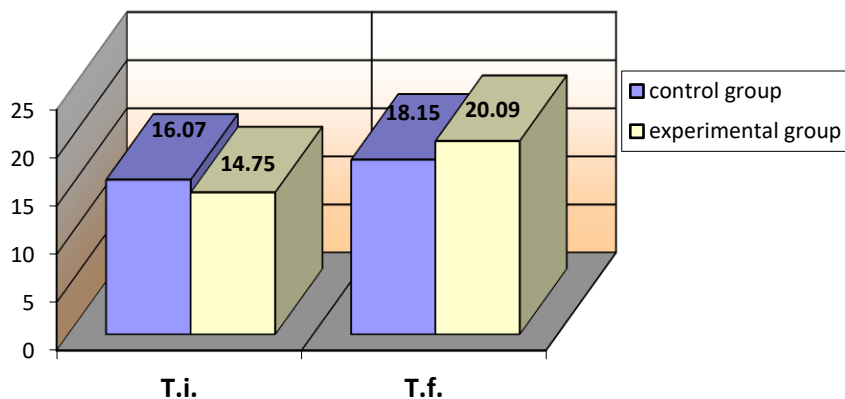
**Table 3 - genuflexions**

Crt. no.	Statistical indicators	Groups of subjects	Initial testing	Final testing
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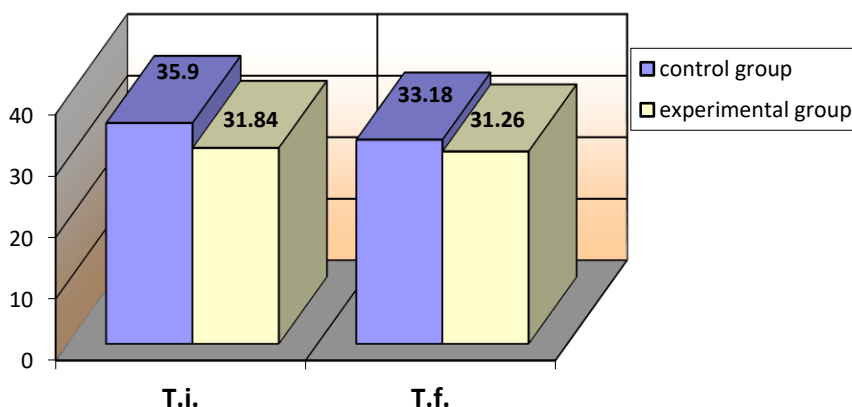
1.	Arithmetic mean	Experimental group	46,33	64,28
		Witness group	44,78	54,72
2.	Standard deviation	Experimental group	14,75	20,09
		Witness group	16,07	18,15
3.	Coefficient of variability	Experimental group	31,84	31,26
		Witness group	35,90	33,18



**Fig. 7- Graphical representation - genuflexions - arithmetic mean**



**Fig. 8- Graphical representation - squats - standard deviation**



**Fig. 9 - Graphical representation - genuflections**  
*- coefficient of variability*

The arithmetic mean for the squat test, shown in the centralized table 3, gives a value of 44.78 for the control group in the initial test and 46.33 for the experimental group, compared to 54.72 in the final test for the control group and a mean of 64.28 squats for the experimental group - final test.

The difference of about 18 push-ups in the arithmetic mean in the experimental group compared to an average of about 10 push-ups in the control group indicates real progress in this sample.

The standard deviation for the experimental group at the initial test is 14.75 and 20.09 at the final test, compared to the control group which obtained 16.07 at the initial test and 18.15 at the final test.

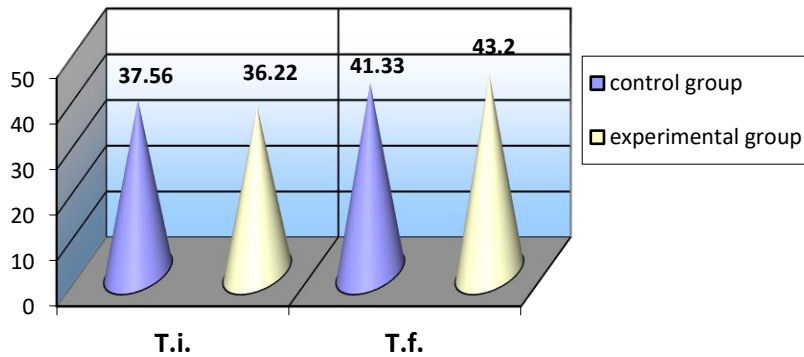
The coefficient of variability indicates a figure of 35.90 at baseline for the control group and 31.84 for the experimental group, and at the final test the control group obtains 33.18 compared to 31.26 for the experimental group. We can notice a better homogeneity in the experimental group compared to the control group.

**Table No. 4 - lifting the torso from the supine position**

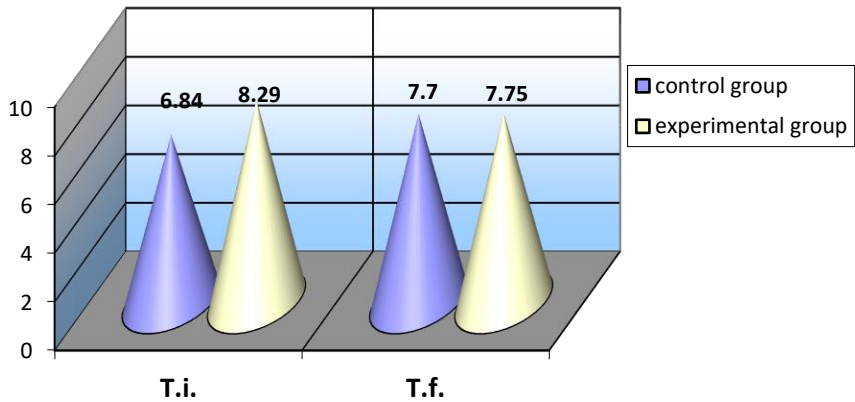
Crt. no.	Statistical indicators	Groups of subjects	Initial testing	Final testing
1.	Arithmetic mean	Experimental group	36,22	43,2



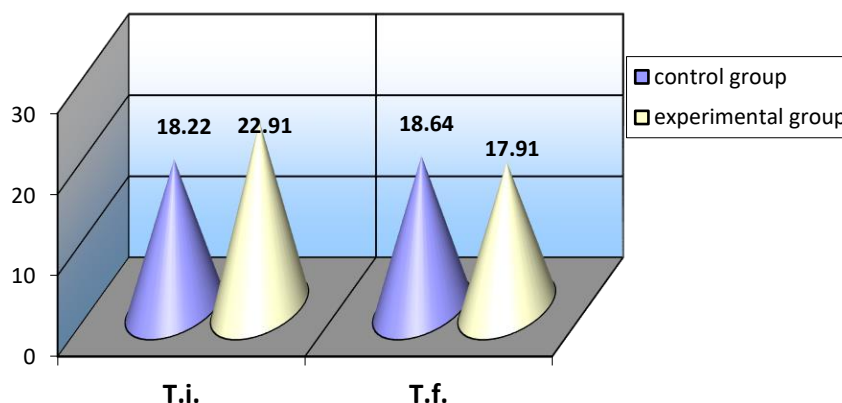
2.	Standard deviation	Witness group	37,56	41,33
		Experimental group	8,29	7,75
3.	Coefficient of variability	Witness group	6,84	7,70
		Experimental group	22,91	17,91
		Witness group	18,22	18,64



**Fig. 10-** Graphical representation - lifting the torso from the supine position  
 - *arithmetic mean*



**Fig. 11-** Graphical representation - lifting the torso from the supine position  
 - *standard deviation*



**Fig. 12- Graphical representation - lifting the torso from the supine position**  
*- coefficient of variability*

The arithmetic mean for the control group in the initial test is 37.56 repetitions and for the experimental group we have an average of 36.22 repetitions. In the final test, the control group obtains an increase of about 4 repetitions compared to the initial test and a percentage of 10.03%, compared to the average of the experimental group of 43.28 repetitions, an increase of 7 repetitions compared to the initial test, i.e. a coefficient of 19.49% . The recorded data indicate that the strength at the abdomen increased more in the experimental group than in the control group, which is shown graphically in Figure 10.

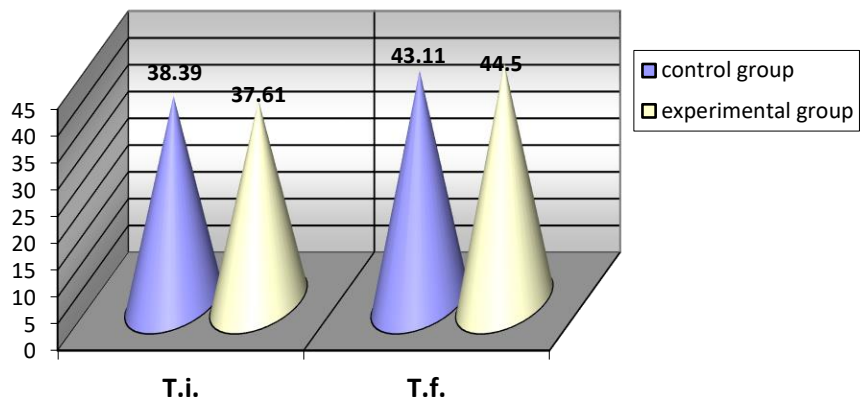
In terms of standard deviation, the coefficients presented in Table 4 show that the control group scored 6.84 in the initial test, compared to 8.29 for the experimental group, and 7.70 in the final test, compared to 7.75 for the experimental group.

The coefficient of variability shows a moderate spread of both groups, both for the initial test, where we obtain the following data: 18.22 for the control group and 22.91 for the experimental group, and for the final test where we have: 18.64 for the control group and 17.91 for the experimental group. There is a better homogeneity for the control group compared to the experimental group.

**Table 5 - trunk extension from facial recumbency**

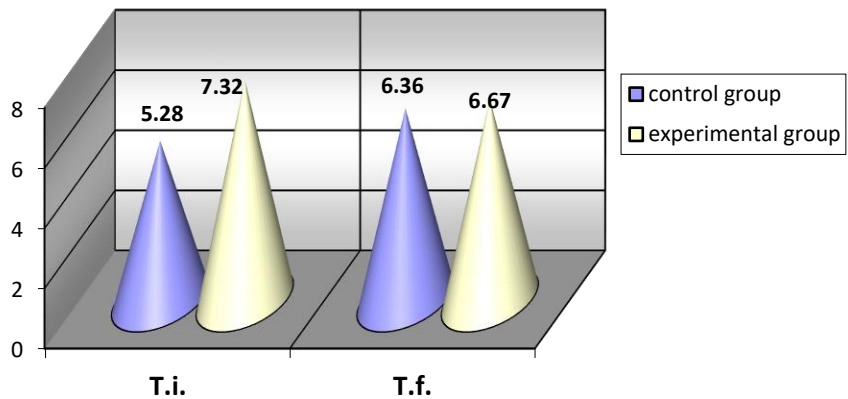
Crt. no.	Statistical indicators	Groups of subjects	Initial testing	Final testing
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1.	Arithmetic mean	Experimental group	37,61	44,5
		Witness group	38,39	43,11
2.	Standard deviation	Experimental group	7,32	6,67
		Witness group	5,28	6,36
3.	Coefficient of variability	Experimental group	19,47	14,99
		Witness group	13,75	14,75



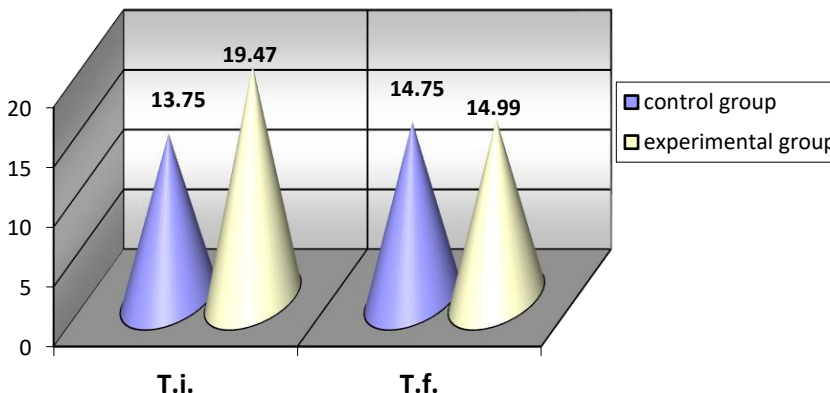
**Fig. 13- Graphical representation - trunk extension from facial recumbency**

*- arithmetic mean -*



**Fig. 14- Graphical representation - trunk extension from facial recumbency**

*- standard deviation -*



**Fig. 15- Graphical representation - trunk extension from facial recumbency**

*- coefficient of variability -*

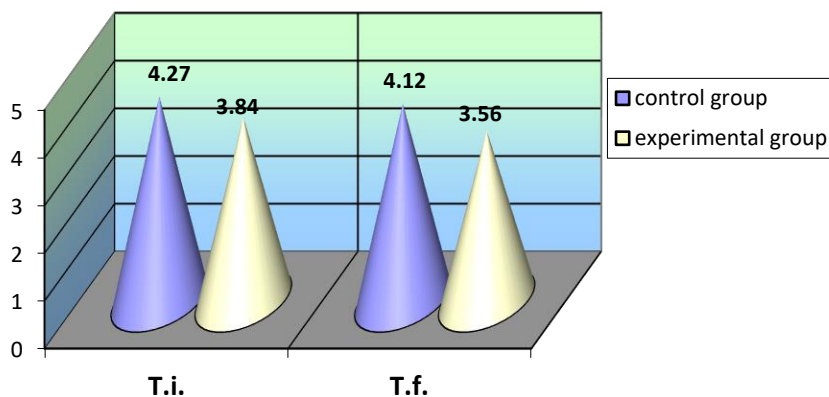
The arithmetic mean in the motor test - trunk extension from the facial recumbency - shown in Table 5, indicates that, at the initial test, the control group obtained an average of 38.39 extensions and 37.61 for the experimental group. At the final test, the control group has an average of 43.11 extensions compared to 44.50 for the experimental group. In the control group, we see an increase in the mean of about 5 repetitions, which is 12.29% from the initial test, and in the experiment group, an increase in the mean of about 7 repetitions, which is 18.31% - increase.

The standard deviation is quite homogeneous for the final test in the two groups involved in the experiment: 6.36 in the control group and 6.67 in the experimental group, and for the initial test, the control group obtains 5.28 compared to 7.32 in the experimental group (fig. 14).

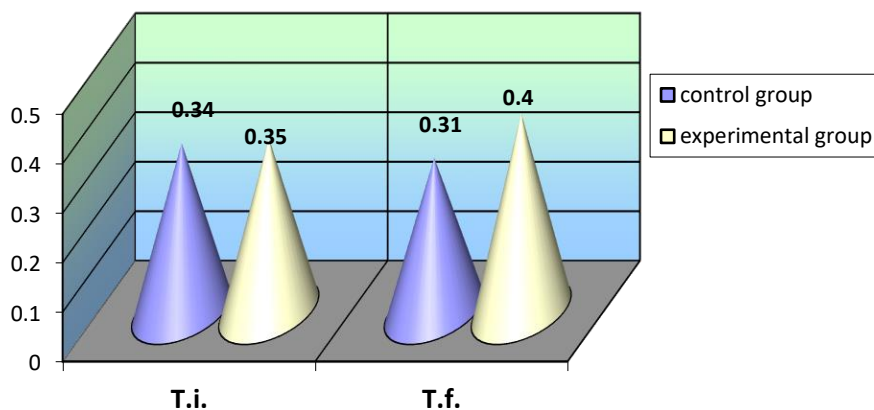
The coefficient of variability shows an average spread for both groups included in the experiment, both in the initial test, where we obtain: 13.75 for the control group and 19.47 for the experiment group, and in the final test where we have: 14.75 in the control group and 14.99 in the experiment group. In the control group we have a higher homogeneity than in the experimental group.

**Table 6 - endurance running**

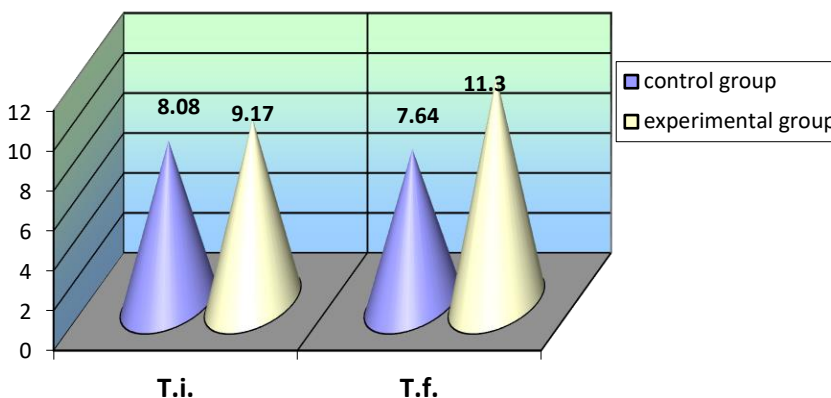
Crt. no.	Statistical indicators	Groups of subjects	Initial testing	Final testing
1.	Arithmetic mean	Experimental group	3,84	3,56
		Witness group	4,27	4,12
2.	Standard deviation	Experimental group	0,35	0,40
		Witness group	0,34	0,31
3.	Coefficient of variability	Experimental group	9,17	11,30
		Witness group	8,08	7,64



**Fig. 16- Graphical representation - endurance running**  
 - arithmetic mean -



**Fig. 17- Graphical representation - endurance running**



**Fig. 18- Graphical representation - endurance running**

- *coefficient of variability* -

Analyzing the graphical representation in figure 16 and the centralized table no. 6, we can see that the arithmetic mean for the 800 m - girls and 1000 m - boys endurance running, at the initial test, the control group obtains a time of 4.27 and the experimental group a time of 3.84, compared to the times obtained at the final test for the control group of 4.12 and the experimental group has a time of 3.56. The difference of 0.15 seconds, representing 3.64% between the initial and final times for the control group is smaller compared to the 0.28 seconds - 7.86% increase between the two tests for the experimental group.

The standard deviation of the experimental group in the initial test is 0.35 and in the final test - 0.40, compared to the score of the control group, which is 0.34 in the initial test and 0.31 in the final test.

The coefficient of variability shows a high homogeneity of the two classes at the initial test, with a value of 8.08 for the control group and 9.17 for the experimental group, and a moderate spread of both groups in the experiment at the final test, where we have for the control group 7.64, compared to 11.30 for the experimental group. We can also say that we have a better homogeneity in the control group compared to the experiment group.

### Conclusions

After analysing the data obtained by the students in the final tests, it can be seen that the scores obtained by the experimental group are higher than the control

group. This shows us the efficiency and effectiveness of the independent variable, represented in our case by the means proposed, the strategy of their application, and the action on the dependent variable (control samples) through evolution and results obtained.

Following the results obtained by the students in the experimental group and their interpretation, the value of the hypothesis is demonstrated and gives us the opportunity to make some proposals and recommendations:

- We propose that planning documents should be as well structured as possible, with carefully selected means and methods, dosed according to age and gender;
- introduction of action learning units - movement games to develop motor skills in secondary school students;
- the use of movement games as diversified as possible at this age makes the teaching-learning activity as attractive as possible, which ensures an increased interest of pupils in the subject of physical education and sport;
- the most effective organisation of motor density by the teacher leads to a greater impact on the progress of secondary school pupils;
- inventing or composing new movement games in order to stimulate and enhance the creative potential of 10 to 14 year old pupils.

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