

THE UTILITY OF MOTOR EVALUATION IN THE ANALYSIS OF EFFECTS OF MOTOR ACTIVITIES ON STUDENTS

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ABSTRACT

This research aims to evaluate the effects of motor activities on pupils at primary education. The two samples of pupils were divided as follows: the first group, experimental group consisted of twenty-five students with the age between ten and twelve years old, thirteen boys and twelve girls, group which followed a specific program containing agonistic, playful and initiation training in sports games; and the second group, the control group, consisted of twenty-five students with the age between ten and twelve years old, fourteen boys and eleven girls, group that took the classical physical education and sports curriculum. The motor evaluation tests at which the students have been evaluated have been taken over from the national evaluation system: speed running on 50 m, 5x10 m relay race, resistance running, jumping, throw off the oina ball, abdominal force, back force, upper members force, and lower member force.

The results showed that the pupils from the experimental group had better performances compared with those from the control group at the final test, indicating the effectiveness of the agonistic, playful and initiation programs in sports games. Differences in the final testing among student groups were significant in all motor tests ($p < 0.05$).

Conclusions have shown that the research hypothesis was valid, so we can say that inclusion of programs with agonistic, playful and initiation in sports games can influence in a good way the student's motor performance at this age.

KEYWORDS: motor activities, motor evaluation,
physical development

1. Introduction

Influenced by the integration in the school environment with large resonance on psychological, personality and emotional plans the small scholar is submitted to more demanding requests, being felt different

depending on his biological development. At this time, the morpho-functional growth and development of school children are faster and generally more uniform than in earlier stages (Croitoru & Șerban, 2002).

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Nowadays, the volume of activities carried out under various and unexpected conditions has grown considerably, because of this, the individual has to show acuity, cleverness, ingenuity, reaction speed, concentration power and ability to transfer attention, the accuracy of movement (spatial, temporal, dynamic) and its own rationalization of biomechanics (Tudor et al., 2014).

Scientist in the physical education and sport domain demonstrated that motor activities contributes in the development of communication, intergroup relationships, and group cohesion. It is demonstrated that sport activities can grow group cohesion, develop into the group positive relationships, we can also discover the group leader and most importantly integrate children into the social group. The cohesion of the scholar group is very important in the performance of the group, so is demonstrated that in groups in which we can find positive relationships like sympathies, friendships and cooperation the efficiency of the work is high (Sopa & Pomohaci, 2014a).

Motor activities can provide at this level of proximity necessary to meet the need to develop new relationships, so after some authors the wide variety of working means in motor activities can provide “personalized routes” carefully managed by specialists so that the moment of satisfaction corresponds to the long-term health benefits, social efficiency, social success, etc. (Bota, 2007).

In physical activity, physical exercise occupies a privileged place because it decisively determines any progress on the line of general improvement and physical development processes. Physical exercises are psychomotor structures created and used systematically, involving displacements of the human body and its segments in the same or different planes and axes, from and to different positions, performed with amplitudes, well-defined

directions and trajectories, with predetermined effort dosages, for the purpose of: learning, re-learning and improving motor skills and abilities; developing conditional and coordinating capacities; recovery and refinement of neuro-myo-arthro-kinetic apparatus functions and other devices and systems, improvement of quality of life; submitted to the feedback process (Marcu & Dan, 2006).

A multitude of skills are taught through team sports by the youth, the most important is fair competition. Today we can find competition in every day leaving and in every domain. For example adults meet competition when searching for a new job or try to find good jobs, children meet the grades competition at school level (Sopa & Pomohaci, 2015).

Specialists define the notion of sport as a general meaning, representing “all forms of physical exercise and dynamic games of more or less spontaneous and competitive nature, originating in the traditional games and the founding myths of modern civilization, and its diversification is related to the fact that it carries values that come from the contemporary ways of life” (Dragnea & Teodorescu-Mate, 2002).

Motor activities can contribute to the development of knowledge (information) about the human body, physical exercises effort, hygiene, movement biomechanics, sporting rules, etc. fitness (motor skills or qualities) is an important element of the influence of physical education. One of the most fundamental element that is developed is health, but also muscle strength, agility, mobility, coordination, etc., and also can contribute in the process of improving the quality of life. Motor qualities acquired in this type of activities are the highest possible number, also contributes to the knowledge of the possibilities of movement, the feeling of new motor sensations, and the development of the universe of knowledge, which favors the

expression of personality. Physical education activities can provide important emotional content so that it generates satisfaction and joy, frees tensions between peers and creates the feeling of freedom in every group member (Kretchmar, 1995).

Specialists certify that motor activities have a big role is the socialization of the individuals, demonstrated by a lot of researches in many areas, most of the scientist testify that these activities represent the perfect setting for the social development of young peoples (Sopa & Pomohaci, 2014b).

As far as physical education and its benefits to the group cohesion, the scientists proves that: physical education can help in improving the cohesion of groups, and is known that having a good cohesion of group can turn to better performances of the group. It's also known that there is a strong relationship between cohesion and performance, and most researchers have come to the conclusion that "the connection between performance and cohesion is reciprocal" (Sopa & Pomohaci, 2014c).

Many researchers concluded that physical activity is considered a "bridge between sedentary life and active life", and the expresses of the static and dynamic attitudes of the human body is stretching. Repeatedly, before the beginning and after finishing physical exercise, as a form of movement, but also "associated with other types of motor activity", stretching can develop muscular flexibility and can make the individual feel well and relaxed, improving the quality of life (Macovei, 2012).

2. Objectives

Structuring an action strategy to improve the situations created and

re-establishing an optimal collegial climate through applying the motor programs which require mutual help and such as competition or team play in a pedagogical experiment.

The increase of motor indices and harmonious physical development by promoting playful and agonistic programs that require the conscious and active participation of students.

3. Materials and Methods

We used the following materials and methods in the experimental research: the study of the specialized bibliography, experimental method (motor tests), observation method.

4. Study Hypothesis

Including in the programs of primary school curriculum of agonistic means and initiation in sports games will positively influence the level of development of bio-motor capacity and physical development.

5. Student Samples

The experiment took place the Gymnasium School no. 173 from Sector 1, Bucharest, with two classes of fourth grades in the school year 2015-2016.

The research samples were divided in two groups: the first group was the experiment group and the second group was the control group.

The experiment group consisted of:

- 25 students aged between 10 and 12, 13 boys and 12 girls.

The control group constituted of:

- 25 students aged between 10 and 12, 14 boys and 11 girls.

Table no. 1

The distribution of the experiment and control groups

Group of students	Gender of children in groups		Age of the children
	Male	Female	
The experiment group	13	12	10-12
The control group	14	11	10-12

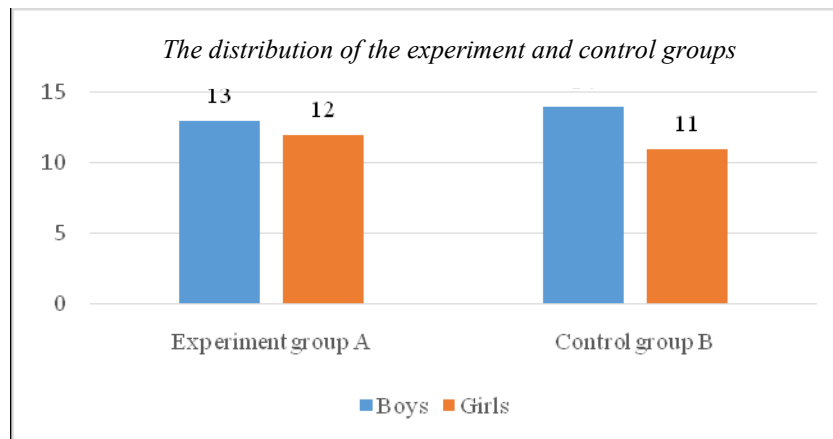


Figure no. 1 The distribution of the experiment and control groups

6. Extracurricular Program Applied at the Experiment Group

In the experiment that we conducted we carried out at the control group the classic two hours of physical education and sports per week that are stipulated in the national curriculum, in which we respected the structure and the timetable of the classical physical education and sports program. So at the experimental group we added to the classic two hours of physical education and sports another two ours extracurricular, in which we used the initiation training programs in basketball and volleyball. Also the experiment group participated in many contests and competitions.

The program with playful, agonistic and initiation training programs included the following:

- dynamic games with the purpose of developing motor qualities or to develop specific and basic motor skills;
- relay races and competitions on teams that had the purpose of proper and harmonious development;
- application trials, aiming the physical development and growth of basic motor skills;
- team sports games (basketball and volleyball) that aimed to develop team cohesion and integrating the child in group.

The extracurricular training programs were based on developing the basic and specific motor qualities and initial skills of team sports, and above all, to develop team spirit, socialization, communication, and cooperation, expressing the educational values of motor activities.

7. The Results of the Experiment

Recording, processing, and interpreting of the initial data obtained at the motor evaluation

Table no. 2

Motor evaluation at the Experimental group – Initial test

Statistical indicators	SR (sec)	RR 5x10 (sec)	ER (sec)	LJ (cm)	TOB (m)	F.ab (rep)	F.bk (rep)	FSM (rep)	FIM (rep)
X	8.45	13.32	208.88	144.80	15.44	21.40	26.36	10.40	22.16
M_e	8.40	13.00	210.00	142.00	16.00	22.00	27.00	10.00	22.00
M_o	8.50	12.00	195.00	142.00	16.00	22.00	28.00	10.00	20.00
A_s	0.47	1.84	19.80	18.12	4.23	3.10	3.70	3.69	3.26
Var	0.22	3.39	392.03	328.25	17.92	9.58	13.66	13.58	10.64

Statistical indicators	SR (sec)	RR 5x10 (sec)	ER (sec)	LJ (cm)	TOB (m)	F.ab (rep)	F.bk (rep)	FSM (rep)	FIM (rep)
A_m	1.80	6.00	62.00	59.00	16.00	12.00	15.00	15.00	12.00
Min	7.70	11.00	180.00	121.00	9.00	15.00	20.00	5.00	16.00
Max	9.50	17.00	242.00	180.00	25.00	27.00	35.00	20.00	28.00
C_v	0.06	0.14	0.09	0.13	0.27	0.14	0.14	0.35	0.15
Skewness	0.51	0.36	0.23	0.55	0.38	-0.18	0.38	0.82	-0.05
Kurtosis	-0.22	-0.98	-1.25	-0.81	-0.54	-0.34	-0.28	0.59	-0.50

Table no. 3

Motor evaluation at the Control group – Initial test

Statistical indicators	SR (sec)	RR 5x10 (sec)	ER (sec)	LJ (cm)	TOB (m)	F.ab (rep)	F.bk (rep)	FSM (rep)	FIM (rep)
X	8.70	16.28	221.40	136.08	13.84	19.60	23.52	9.12	20.44
M_e	8.70	16.00	220.00	136.00	13.00	19.00	23.00	9.00	20.00
M_o	8.40	16.00	198.00	125.00	15.00	24.00	23.00	7.00	18.00
A_s	0.44	2.64	16.70	13.69	3.01	3.42	2.74	2.37	2.57
Var	0.19	6.96	278.92	187.33	9.06	11.67	7.51	5.61	6.59
A_m	1.70	9.00	62.00	52.00	11.00	11.00	11.00	10.00	9.00
Min	7.90	12.00	190.00	110.00	10.00	15.00	19.00	6.00	16.00
Max	9.60	21.00	252.00	162.00	21.00	26.00	30.00	16.00	25.00
C_v	0.05	0.16	0.08	0.10	0.22	0.17	0.12	0.26	0.13
Skewness	0.40	0.34	0.13	-0.12	0.70	0.32	0.45	1.03	0.14
Kurtosis	-0.32	-0.42	-0.57	-0.81	0.04	-1.10	-0.15	1.41	-1.10

SR – Speed running

RR – Relay race

ER – Endurance running

LJ – Long jump

TOB – Throwing the oina ball

F.ab – Abdominal force 30 sec

F.bk – Back force 30 sec

FSM – Force of the superior members 30 sec

FIM – Force of the inferior members 30 sec

X – Arithmetic mean

M_e – Median

M_o – Module

A_s – Standard deviation

Var – Variability

A_m – Amplitude

Min – Minimal value

Max – Maximal value

C_v – Coefficient of variability

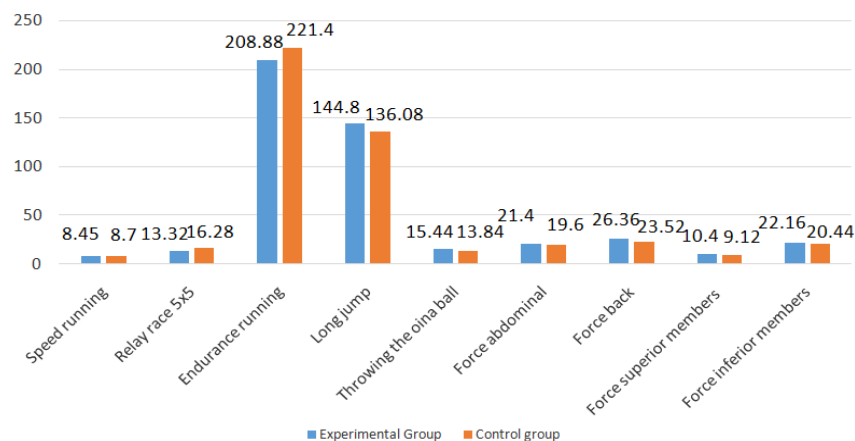


Figure no. 2 The results of the motor evaluation at the Experiment Group and the Control Group at the Initial test

At motor evaluation test “speed running”, we found a difference of 0.25 seconds was recorded between the experiment group (8.45 s) and the control group (8.70 s). At the “5x10 m relay race” test, we can observe a difference of 2.96 seconds at the experiment group (13.32 s) and the control group (16.28 s).

Regarding the “endurance run” we observe a difference of 12.54 seconds between the experiment group (208.88) and the control group (221.42). At the “long jump” test, we recorded a discrepancy of 8.72 cm at the experiment group (144.80 cm) and the control group (136.08 cm).

At the “throwing of the oina ball” evaluation, we can see a progress of 1.60 m,

at the experiment group (15.44 m) compared with the control group (13.84). In the “abdominal force” test, we can observe a progress of 1.80 rep. for the experimental group (21.40 reps) and the control group (19.60). With regard to the “back force” test, we recorded a progress of 2.84 reps, at the experiment group (26.36 reps) and the control group (23.52 rep).

In “force of the superior members” test, we analyzed a difference of 1.28 reps between the experimental group (10.40 rep) and the control group (9.12 rep). Regarding the “force of the lower members” test, we noticed a difference of 1.72 rep, between the experimental group (22.16 rep) and the control group (20.44 rep).

Recording, processing, and interpreting of the final data obtained at the motor evaluation

Table no. 4

Motor evaluation at the Experimental group – Final test

Statistical indicators	SR (sec)	RR 5x10 (sec)	ER (sec)	LJ (cm)	TOB (m)	F.ab (rep)	F.bk (rep)	FSM (rep)	FIM (rep)
X	8.07	11.04	201.48	152.56	17.52	23.40	29.16	13.32	25.72
M_e	8.10	11.00	200.00	150.00	17.00	24.00	29.00	13.00	26.00
M_o	8.10	10.00	180.00	150.00	14.00	22.00	26.00	12.00	28.00
A_s	0.39	1.31	19.54	18.36	4.10	2.50	3.69	4.05	2.84
Var	0.16	1.71	381.76	337.17	16.84	6.25	13.64	16.39	8.04
A_m	1.60	5.00	62.00	62.00	15.00	9.00	15.00	16.00	10.00
Min	7.40	9.00	170.00	130.00	12.00	19.00	23.00	8.00	20.00
Max	9.00	14.00	232.00	192.00	27.00	28.00	38.00	24.00	30.00
C_v	0.05	0.12	0.10	0.12	0.23	0.11	0.13	0.30	0.11
Skewness	0.50	0.65	0.07	0.67	0.86	-0.10	0.55	0.89	-0.20
Kurtosis	0.16	-0.56	-1.42	-0.53	0.04	-0.71	-0.12	0.72	-0.81

Table no. 5

Motor evaluation at the Control group – Final test

Statistical indicators	SR (sec)	RR 5x10 (sec)	ER (sec)	LJ (cm)	TOB (m)	F.ab (rep)	F.bk (rep)	FSM (rep)	FIM (rep)
X	8.53	14.88	214.24	138.76	15.28	21.04	24.92	10.92	21.72
M_e	8.50	15.00	214.00	140.00	15.00	21.00	25.00	10.00	22.00
M_o	8.50	14.00	230.00	130.00	16.00	18.00	25.00	10.00	22.00
A_s	0.42	2.15	14.49	13.40	2.48	3.41	1.85	2.18	2.54
Var	0.18	4.61	209.86	179.44	6.13	11.62	3.41	4.74	6.46
A_m	1.60	9.00	55.00	50.00	10.00	10.00	8.00	9.00	10.00
Min	7.70	11.00	185.00	115.00	12.00	16.00	22.00	8.00	16.00
Max	9.30	20.00	240.00	165.00	22.00	26.00	30.00	17.00	26.00
C_v	0.05	0.14	0.07	0.10	0.16	0.16	0.07	0.20	0.12
Skewness	0.34	0.66	-0.35	-0.01	0.82	0.16	0.69	0.90	-0.14
Kurtosis	-0.47	0.52	-0.59	-0.84	1.07	-1.22	1.34	1.00	-0.29

SR – Speed running
 RR – Relay race
 ER – Endurance running
 LJ – Long jump
 TOB – Throwing the oina ball
 F.ab – Abdominal force 30 sec
 F.bk – Back force 30 sec
 FSM – Force of the superior members 30 sec
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X – Arithmetic mean
 M_e – Median
 M_o – Module
 A_s – Standard deviation
 Var – Variability
 A_m – Amplitude
 Min – Minimal value
 Max – Maximal value
 C_v – Coefficient of variability

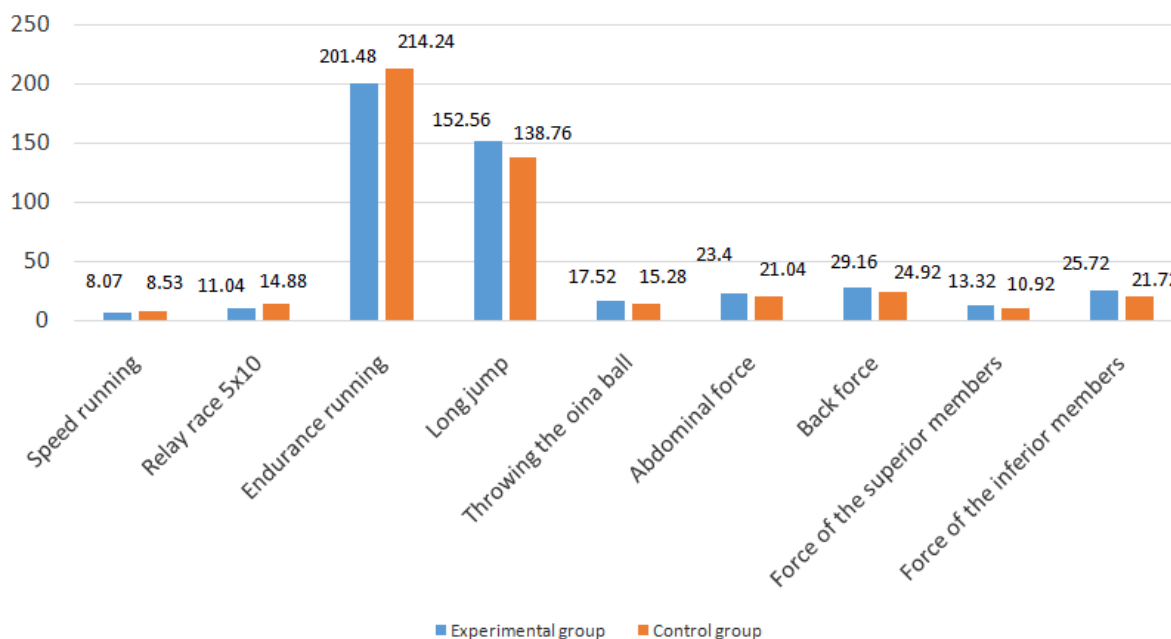


Figure no. 3 The results of the motor evaluation at the Experiment Group and the Control Group at the final testing

At “speed running” evaluation test, we found a difference of 0.46 seconds between the experiment group (8.07 s) and the control group (8.53 s). At the “5x10 m relay race”, we observed a difference of 3.88 seconds between the experiment group (11.04 s) and the control group (14.92 s).

Regarding the “endurance run” we discovered a progress of 12.77 seconds between the experiment group (201.48) and the control group (214.25). At the “long jump” test, we recorded a difference of 13.77 cm between the experiment group (152.56 cm) and the control group (138.79 cm).

At the “throwing of the oina ball” evaluation, we see a difference of 2.23 m, between the experimental group (17.52 m)

and the control group (15.29). In the “abdominal force” test, we see a difference of 2.36 reps, between the experiment group (23.40 rep) and the control group (21.04 rep). As for the “back force” test, we recorded a difference of 4.20 reps between the experiment group (29.16 reps) and the control group (24.96 rep).

At the “force of the superior members” test, we observed a difference of 2.40 reps between the experiment group (13.32 reps) and the control group (10.92 reps). Regarding the “force of the lower members” test, we noticed a progress of 3.97 reps, at the experimental group (25.72 reps) and the control group (21.75 rep).

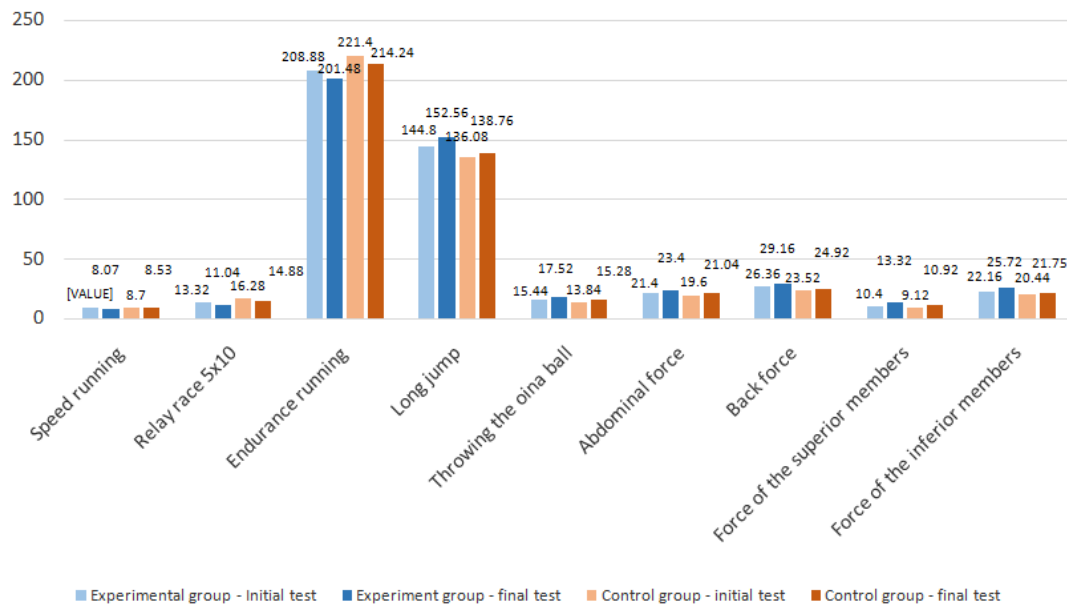


Figure no. 4 The difference between the Initial test and Final test at the Experimental Group and the Control Group at the motor evaluation

The next phase was to analyze the differences at the initial and final motor evaluations regarding our two groups, experiment, and control, so we can observe the following:

- At the “speed running” test, we notice that in the experimental group we recorded a decrease of time by 0.38 sec and a decreasing percentage of 4.50 %, superior to the control group, which had a decrease of the execution time of 0.17 sec and a rate of decreasing of 1.95 %; at the application of the T-test meaning test we can notice that the value of t was -4.02622 and the value of p was 0.0001, $p < 0.05$, which indicates a meaningful difference between our two groups of pupils.
- At the “5x10 m relay race” test, we observe that in the experimental group we obtain a decrease of the execution time by 2.28 sec, with a decreasing rate of 17 %, better than the control group, which registered a decrease of the time of 1.40 sec and a decreasing rate of 8.41 %; calculating the T-test meaning test, we noticed that the value of t was

- -7.63937, and p of 0.00001, $p < 0.05$, indicating a meaningful difference between the two groups of students.
- At the “endurance run” evaluation, we note that the experimental group obtained a decrease in time by 7.40 sec and a decreasing percentage of 3.54 %, better than the control group which obtained a time reduction of 7.16 sec and a decreasing rate of 3.24 %; by applying the T-test meaning test, we observed that the value of t was -2.62301, and p was 0.005824, $p < 0.05$, indicating a meaningful difference between the two groups of students.
- Upon the assessment of the “long-distance jump” we can see that the experiment group recorded an progress of 7.76 cm and a growth rate of 5.36 %, better than at the control group which registered an increase of 2.68 cm with a growth rate of 1.99 %; By applying the T-test significance test, we observed that the value of t was 3.03575 and p of 0.001935, $p < 0.05$, indicating a meaningful difference between the two groups of students.

- In the evaluation of the “throwing of the ball” we can see that the experimental group recorded a growth of 2.08 m, with a growth rate of 13.47 %, superior results better than the control group which registered an increase of 1.44 m and a rate of growth of 10.16 %; at the application of the T-test meaning test, we registered a value of t of 2.33689 and p of 0.11833, $p < 0.05$, indicating a meaningful difference between the two groups of students.
- At the “abdominal force” test, we saw a progress of 2 repetitions in the experimental group, with a growth rate of 9.35%, better than the control group, where there was an increase of 1.44 repetitions and a growth rate of 7.18 %; the application of the T-test meaning test, we observed that the value of t was 2.79113 and that of p was 0.003758, $p < 0.05$, which indicates a meaningful difference between the two groups of students.
- For the “back muscular force” test, we see an increase of 2.8 repetitions and an increased rate of 10.62 %, compared to the control group that achieved a better performance of 1.40 repetitions and a growth rate of 6.03 %; the application of the T-test meaning test, we see that the value of t was 5.13421 and p of 0.00001, $p < 0.05$, which indicates a meaningful difference between the two groups of students.
- At the “force of the superior members” test, we observed an increase in the experimental group of 2.92 repetitions and a growth percentage of 28.08 %, compared to the control group where we noticed an increase of 1.80 repetitions and a growth rate of 19.61 %; the application of the T-test meaning test, we observed that the value of t was 2.61014, and p of 0.006018, $p < 0.05$, indicating a meaningful difference between the two groups of students.
- At the “force of the inferior members” test, there was an increase in the experimental group of 3.56 repetitions and a growth rate of 16.06 % compared to the control group where we registered a lower growth of 1.31 reps and a developing rate of 6.30 %; the application of the T-test meaning test we saw that the value of t was 5.25165, and p of 0.00001, $p < 0.05$, indicating a meaningful difference between the two groups of students.

8. Conclusions

Including agonistic means of initiating in sports games at the training schedule of kids from the primary school level can help the progress of bio-motor capacity and physical development, we can say that the hypothesis has been validated by the results of the tests and final measurements, we can see meaningful differences between the two tests in the experimental group, and we also find significant differences between the final results of the test group compared to the control group.

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