

## ATHLETICS SPECIFIC MEANS OF IMPROVING PHYSICAL ENDURANCE IN SECONDARY SCHOOL STUDENTS

Constantin ALBINĂ, Alina Elena ALBINĂ, Andreea Mihaela ALBINĂ

*Faculty of Physical Education and Sport, University of Craiova, Romania*

**Abstract:** Physical Education in schools is regarded as an activity of national interest due to its aims of strengthening the physical state, building and enhancing positive features of character as well as developing basic motor skills, especially endurance and speed.

Physical endurance is a motor feature which can be developed with the help of athletics specific methods and means. The whole variety of motor actions performed by each primary school student - their daily and sport activity - reaches high standards only if it is based on strength development.

**Keywords:** *endurance, students, methods, exercises.*

### Introduction

It is obvious and practice has shown that the level of development of endurance determines the fulfilment of the requirements of the physical education and sport syllabus, provided by the curriculum, which is related among others to the widening and refinement of knowledge, abilities and motor skills systems, and motor skills development [2,3].

Endurance is an accessible and improvable quality for all ages and for this reason it appears in all classes, thus being paid greater attention [6].

It is also known the fact that children can more easily sustain their long-term efforts to the detriment of the intense ones [1].

### Motivation of the chosen themes

Developing endurance through means specific to athletics is a very attractive method for students, and we wanted to exemplify this by using the most popular and accessible exercises.

### The purpose of the paper

Starting from the idea that endurance is an important motor quality, we have proposed that in the paper we should pursue and obviously see if endurance, meaning the ability to perform effortlessly, can be a preoccupation of the teacher at the secondary school cycle, in our case eighth grade, that is, at the age of 14-15 years old.

We also wanted to determine to what extent age particularities can and must influence choice of means in the development of endurance and their two characteristics: volume and intensity.

### Work hypothesis

Endurance, an important motor quality, has good development conditions in the secondary school cycle, especially in the eighth grade, using methods and means specific to athletics.

### Research tasks

- Detection of general and specialized works regarding the subject: compilation of the bibliographic index;
- Study of bibliography, documentation sheets, translations. Establishing and organizing the experiment team, choosing work places; fixing work conditions;
- Establishing and specifying the methodological data of the experiment (exercises, planning, dosing, preliminary and on-going checks, etc.) in relation to the structure of the school year;
- Conduct, systematization and analysis of the data obtained by the experiment;
- Establishing the drafting data of the paper;
- Drawing up the paper and presenting it for obtaining the approval in principle, provisional conclusions;
- Finishing the work; drawing up the annexes, tables, lesson plans, protocols, charts, etc.

### Research methods

Several methods were used in the research to provide the ways to solve the proposed tasks. These methods were:

- Documentation method.
- Observation method.
- Experimental method.
- Test method.
- The statistical-mathematical method of processing and interpreting data.

### Theoretical foundation of the work

The development of psychomotor skills is of particular importance in the activity of physical education and sport.

In multilateral physical training an important place is the development of endurance, the high level of which is the necessary condition for the subsequent practice of all sporting branches without exception, and especially of the athletic ones, claiming higher requirements for the manifestations of this quality [4,5].

Physical endurance is a perfectible driving quality as a result of a systematic, continuous follow-up of certain rules, of specific physical exercises, keeping oneself at the value achieved for a long time [10].

### **Research organization**

#### **Subjects**

The experiment was attended by students from the eighth grade, from the Secondary School Nr. 21 Craiova, Dolj County, who studied in the school year 2017-2018 – control group and experimental group.

The level of training in these classes was good and it improved continuously throughout the research, reaching the end of the research at a very good level of training in the development of endurance.

#### ***Frame pattern of action on the development of endurance in the eighth grade***

This pattern is the result of our activity along the experiment, of the recorded and obvious results of the experiment. Their good value has strengthened our conviction that we have chosen the action systems, methods and exercises well.

Exercises for the development of endurance were scheduled in each lesson at the end of the lesson, with a time not to hinder work to accomplish the other lesson objectives.

Exceptions to this plan are the lessons in which the passing of general or special test was scheduled.

Given the long time spent on the development of endurance and the structure of the school year, we could set a number of methodological objectives such as [7, 8, 9]:

#### ***Objectives:***

- gradually becoming accustomed to the endurance effort;
- developing aerobic capacity and habituation with the planned training time;
- development of mixed (aerobic-anaerobic) or anaerobic lactacid capacity;
- getting used to the sporting competition by organizing various competitions.

The first semester begins with a week of resuming and adapting to the effort of physical education lessons; follows a week of passing tests; the following weeks are reserved for the development of aerobic capacity by what we call “long-lasting running in tempo pace”, the continuous increase of the distance and the constant preservation of

the intensity (tempo). In the last week we tested the endurance strength for the second time through the 800m flat test for girls and 1000m for boys.

Methodical procedures: “Long-lasting running in tempo pace with continuous increase of distance and constant preservation of intensity” (of the tempo).

In the last week we tested the endurance ability for the second time through the 800 m flat test for girls and 1000 m for boys.

This is the structure of the school year in the experimental classes: the number of weeks was in the first semester of 18, so the number of lessons was 18, hence 18 hours. The second semester consisted of 17 weeks and 17 lessons-hours.

We started the experimental activity after assigning the leaning units (in the eighth grade) the number of lessons to each one, knowing that a lesson can have several learning units (themes).

Under these circumstances we planned and programmed endurance development activity both in the first and second semesters.

In this way, we believe that we have achieved the objectives proposed for the first semester, namely resuming and accustoming to the effort made during the lessons, and also the development of aerobic capacity. This statement will be certified by the results obtained in the tests.

In the second semester we insisted on solving the third proposed methodical objective: developing the anaerobic lactacid capacity (in the mixed area).

Methodical procedures: Long-lasting running in tempo pace with continuous and progressive drop in running distances and strength intensification (of the tempo) with sufficient and bearable growth rates.

For this we used the following options:

- Long-lasting running in tempo pace with the continuous and progressive decrease of the running distances;
- strengthening the intensity (tempo pace) with sufficient and bearable growth rates;
- repeated running over 100, 200 and 300 m distances in tempo pace, reinforced from week to week, using the repetition method.

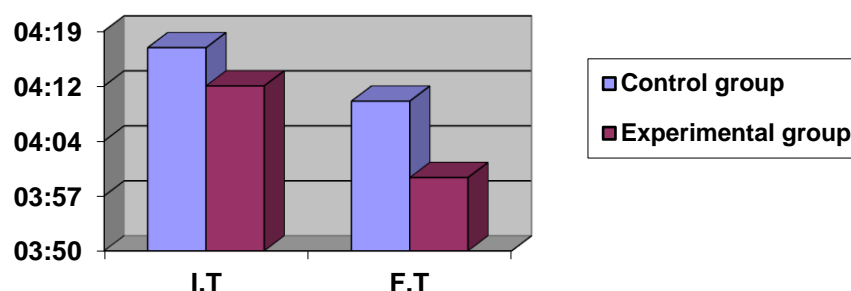
We also used in the training of the students, the motion games and the athletics specifics we have presented below.

**Research results and their interpretation****Endurance running 800 m flat – girls and 1000m flat - boys.**

- INITIAL AND FINAL TESTS GIRLS Table no.1

No.	CONTROL GROUP			EXPERIMENTAL GROUP		
	Surname and name	Endurance running 800m (min)		Surname and name	Endurance running 800m (min)	
		I. T	F.T		I. T	F. T
1	A.O	4:25	4:20	P.O.	4:25	4:00
2	A.D	4:19	4:14	D.M.D.	4:19	3:54
3	B.A	4:43	4:30	G.M.	4:43	4:10
4	C.S	4:23	4:14	P.G.	4:23	4:04
5	C.C	4:32	4:25	D.M.I.	4:29	4:05
6	E.F	4:10	4:05	T.A.	4:54	4:05
7	G.R	4:09	4:00	U.A.	4:24	4:00
8	I.O	4:47	4:25	C.L.M.	4:27	4:02
9	I.N	4:29	4:15	T.E.	4:07	3:44
10	U.S	4:54	4:25	T.A.	4:12	3:52
11	T.I	4:24	4:10	U.A.	4:22	4:03
12	B.E	4:27	4:12	x	4:12	4:00
13	D.A	4:19	4:02	$\sigma$	3,10	3,30
14	F. C	4:26	4:12	cv	1,22	1,42
15	N.O	4:07	3:54			
16	R.A	4:12	4:02			
	x	4:17	4:10			
	$\sigma$	3,00	1,02			
	cv	1,02	1,0			

**Endurance running 800m - girls**  
**Arithmetic average**



The averages obtained in the two tests during the experiment: I.T. – 4:17 and 4:10 at F.T. for the control group. The growth rate is significant, meaning 7 seconds between the first and second test.

In the experimental group, the following results were obtained 4:12 in I.T. and 4:00 in the final test, so a steeper increase of 12 sec.

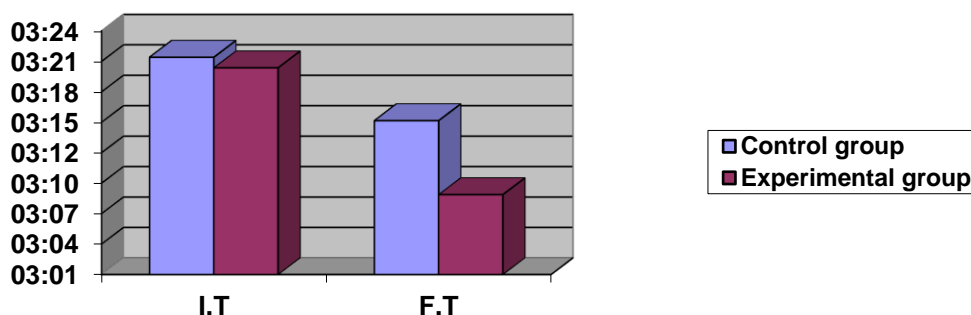
The variability coefficients indicate high homogeneity in the two tests. We can still state at this stage that the main purpose of our work has been achieved, even if at first sight the growth rates would seem insignificant.

We also notice that a number of 3 girls have reached the limit of 4 min/800 m in the control group and 10 girls in the experiment group. The best of them got even 3:40 in that test.

- INITIAL AND FINAL TESTS BOYS Table no. 2

No.	CONTROL GROUP			EXPERIMENTAL GROUP		
	Surname and name	Endurance running 1000m (min)		Surname and name	Endurance running 1000m (min)	
		I.T	F. T		I. F	F. T
1	B.A.	3:24	3:10	A.G.	3:23	3:04
2	B.C.A.	3:27	3:12	B.C.	3:32	3:25
3	B.M.	3:19	3:02	C.C.	3:30	3:05
4	D.I.	3:26	3:12	P.G.	3:19	3:00
5	I.A.	3:07	2:54	E.G.S.	3:57	3:05
6	I.S.T.	3:12	3:02	G.S.	3:39	3:15
7	F.A.	3:42	3:23	N.F.S.	3:54	3:05
8	G.T.	3:34	3:14	P.D.	3:34	3:10
9	G.G.	3:54	3:25	R.V.N.	3:37	3:12
10	N.A.R.	3:24	3:10	R.D.	3:29	2:52
11				T.C.	3:26	3:12
12				N.B.	3:27	2:54
13				S.I.	3:22	3:02
14				Z.C.A	3:42	3:13
	x	3:22	3:16	x	3:21	3:09
	$\sigma$	3,30	1,12	$\sigma$	3,00	1,02
	CV	1,42	1,17	CV	1,02	1,0

*Endurance running 1000m - boys*  
Arithmetic average



The students in the control group obtained in the initial test a value of the arithmetic average of 3:22, and in the final test a value of 3:16, so a difference between the averages of 6 sec.

The students in the experimental group who used in the physical education and sport class motion games and relay games specific to athletics achieved an average of the results of 3:21 in the initial test, very close to the value of the control group, but at the final test they obtained a lower average of the results with 12 seconds, that is 3:09.

Of the students in the control group, 3 reached the results of almost 3 minutes, one just under this scale, and 8 of the experimental group came to the value of 3 minutes and the best performance was 2:52.

### Conclusions

- The end of our experiment, the observations made in the specialized literature suggest that we can draw some pertinent conclusions.

- First of all, we have to say that, in our opinion, the research hypotheses have largely confirmed what allows us to appreciate that the experiment carried out in good conditions has been effective.

- In the gymnasium cycle, especially in the eighth grade, resistance is proving to be an important quality not only for physical education lessons. Resistance development is achieved by applying program content and special programs. Endurance has in the eighth grade good development conditions.

- As we have proposed, we managed that the increased concern for the development of

endurance in physical education lessons not to negatively influence the development of other motor skills and the achievement of other instructive-educational objectives.

- At the end of our study, the results obtained allowed us to achieve a level of endurance development that is very good in our opinion, being above the level of the grade 10 in many cases.

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