

STRATEGIES FOR IMPROVING THE FUNCTIONAL PARAMETERS OF THE STUDENTS OF THE UNIVERSITY OF BUCHAREST

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Abstract: *Introduction. The knowledge and development of the functional parameters has always been a concern of the specialists in the field of physical education and sport. Research Methods. Testing method, statistical-mathematical method, graphic representation method. Research results. In the Ruffier test the average index is equal to 9.53 indicating an average effort capacity in the experimental group respectively 12.25 in the control group, satisfactory effort capacity. The effect size (0.71) shows a medium to large difference between the averages of the two groups. Conclusions. The students managed to improve their capacity for effort, improvement which is observed in the light of the results obtained at the final test.*

Key words: *strategies, functional parameters, students*

1. Introduction

The knowledge and development of functional parameters has always represented a concern to specialists in the field of physical education and sport, as this approach is the basis for the elaboration of different intervention strategies specific to each education cycle.

The capacity of physical exertion is represented by the possibilities of the active muscular system to release the necessary energy to produce a mechanical work as high as possible and to maintain it for as long as possible. The muscular system can release energy through anaerobic glycolysis or oxidative

phosphorylation. Depending on the needs and possibilities of oxygen supply, physical exertion becomes predominantly aerobic or anaerobic. [4]

The aerobic efforts are characterized by the following: they are of low, medium, submaximal intensity [3] and are carried out under conditions of real or apparent balance between the requirements and the oxygen supply; it can last 3 minutes to several hours. After an hour of continuous effort, free fatty acids are used as energy source.

2. The Premises of the Research

As a component of fitness, effort

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capacity contributes to carrying out daily activities with vigour and efficiency and increasing human performance; [7]

The health of the subjects is good during the research;

The subjects are receptive and cooperative;

The training program is accessible to the level of motor skills of the subjects included in the research.

3. Objectives and Tasks of Experimental Research

- Preparation of the organizational and methodological framework in order to conduct the experimental study;
- Evaluation of the functional level of students (effort capacity); Develop and experiment an intervention strategy to optimize the effort capacity;
- Selecting and structuring the specific means of aerobic gymnastics and swimming used in research;
- Designing the individual programs that will be executed within the independent activity.

4. Hypothesis of Experimental Research

In order to carry out the research I have issued the following hypothesis:

The application of a regular program of sports activities, of aerobic type, over 40 minutes, 3-5 times a week, will determine positive effects at a functional level and will improve the effort capacity of the subjects engaged in the research.

5. Research Methods

For the elaboration of the research and

especially for the verification of the established working hypothesis, we used the following research methods:

Pedagogical documentation, a method that offered me the possibility to study the specialized literature, regarding the issue of the work.

Method of recordings

The subjects recorded the heart rate values at different times of the independent program.

Testing method

It was necessary for the objectification of all processes and other variables subject to scientific research. The tests used were directly related to the objectives and provided complete data research regarding the quality and efficiency of the strategies applied.

For the evaluation of the functional parameters, the effort capacity, it was used the Ruffier Test)

Statistical-mathematical method

The data obtained through tests and measurements were analysed and interpreted using the statistical-mathematical method;

Graphical representation method

This allowed me to express the processed data and the resulting findings. I also used graphical representations as a means of analysing the research results. [11]

6. Organization and Conduct of Research

The sample under investigation consisted of 240 students, aged 18-20, from the University of Bucharest, from the first year, included in an organized system

of participation in the physical education course as a compulsory subject.

The respective experimental group consisting of 120 subjects participated both in the two hours of physical education per week, as well as in a program of independent physical activity, 3-5 times a week, lasting 40-60 minutes, practicing a recreational sport.

In order to determine the efficiency of the activity carried out with the experimental group, we used a control group, respectively half of the sample, i.e. 120 subjects, who preferred only the activity in the basic course, participating only in a physical education lesson per week.

6.1. Establishment of research groups

The formation of the groups was done by voluntary adhesion; students were presented the idea of differentiated and independent activity. There were mentioned the prospect of improving the physical aspect, improving the motor capacity and the possibility of obtaining better grades regarding the specific control rules.

In order to determine the efficiency of the differentiated activity carried out with the experimental group, we used a control group, which for different reasons did not want to participate in the experiment, preferring the activity and the rigor of the basic course.

Details on the working methods for each group:

- The experimental group (of students) will participate in individualized programs using the following means: aerobic gymnastics [6], company dance [8], swimming [10], jogging, performed as an independent activity, as well as sports,

recreational programs, from which they may list: "The Run for Health Program" , "Relax by dancing", "Sports Week for All in the University", "Better fitness through cycling", "Preventing obesity through swimming"[12], "Gymnastics for a beautiful body", "Excursions and hiking on the weekend" .

- The witness group will be limited to one lesson per week, during the physical education course.

- Both the control group and the experimental group will work, during the physical education course, following a common program (the content of the lessons will be the same in both groups).

The experimental research started in October 2018 and was completed in May 2019, so it took place during a university year.

The investigations were carried out on the students from the University of Bucharest, representing the basic research.

The research was carried out on the sports base of the University of Bucharest and the "Steaua" basin.

Functional capacity testing was done through an effort capacity exploration test.

For the evaluation of the effort capacity, a non-specific test is used: the estimation of the aerobic power (maximum VO₂) by the indirect method, using the Ruffier test.

The capacity of physical exertion is represented by the possibilities of the active muscular system to release the necessary energy to produce a mechanical work as high as possible and to maintain it for as long as possible.

Cardio-respiratory resistance is represented by "the ability of lungs and the heart to provide muscles with oxygen and nutrients through blood." [9]

The effects of cardio workout are manifested if the pulse is maintained within 60-90% of the maximum heart rate. [1] If we train near the lower heart rate limit we will benefit from improved fat metabolism and changes in the slow contraction fibres while the training near the upper limit will cause changes in the fast contraction fibres and cardiovascular benefits. [9]

The improvement of the aerobic training is realized if the duration of the effort is

between 30-60 minutes. If the aerobic effort is made after the end of the muscular endurance training, fat metabolism is more efficient. [5]

7. Research Results

Comparative analysis of the results obtained at the functional evaluation, the experimental group - the control group, the final test;

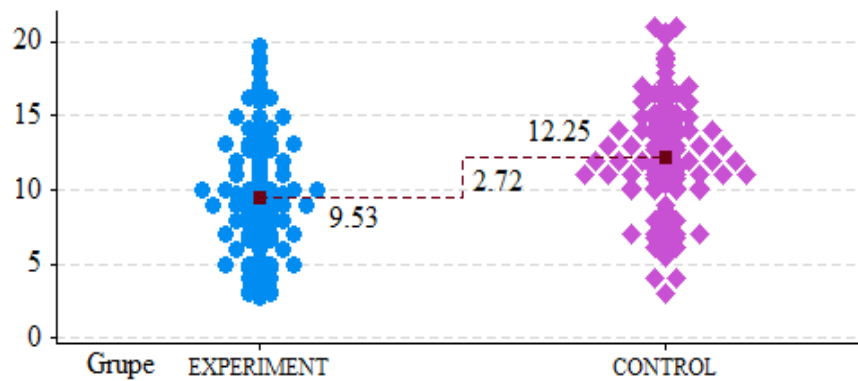


Fig. 1. Image of Ruffier test

Functional index Ruffier test

Table 1

GROUPS	Media	Average difference (E-C)	Median	St.dev.	Minimum	Maximum	Amplitude	Coef. variation
Experiment	9.53	-2.72 (22.2%)	9.1	3.86	2.7	19.8	17.1	40.5%
Control	12.25		12.0	3.84	3.0	21.0	18.0	31.4%

Bilateral independent test

Table 2

Levene test for equal dispersion		Equal dispersion?	T test for equality of means				Effect size
F	Sig.		Average difference	t	df	p	
0.0002	0.990	DA	-2.72	5.469	238	<0.001	0.71

8. Conclusions on "Functional capacity testing"

Following the statistical-mathematical processing of the results obtained by the students of the two groups, the following conclusions are drawn:

The students were able to improve their effort capacity, improvement which can be observed in the results of the final test.

The systematic self-control of the pulse (in each lesson) constituted a criterion of objective evaluation of the effects of the efforts made.

We consider that the programs elaborated and subjected to experimentation, through the specific exercises that aimed at improving the effort capacity were effective.

The practice of sports-recreational activities, after a certain program, rigorously elaborated, together with an individualized program consisting of 3-5 times per week of independent activity, has led to the development of aerobic capacity to higher values. It can therefore be appreciated that the hypothesis in whose spirit the research was conducted has been confirmed.

Based on the conclusions obtained from the processing of the obtained data, programs are designed to increase the efficiency of the physical education lessons in this age group. [2]

In this social category I work on objectives, with the awareness of the effects of this type of effort, as well as the creation of a reference benchmark of their own aerobic capacity and indirectly of the functional states which favour the increase of motivation for practicing the

bodily activities in general and their independent practice in particular.

The systematic practice of the physical activities of aerobic type, by the students of the University of Bucharest has had beneficial effects on the capacity of effort or a better adaptation of the body to physical demands of aerobic nature. In fact, the Ruffier test provides objective indicators for assessing the cardiovascular and respiratory function. The fact that the cardiovascular apparatus - of high sensitivity and relatively easy to measure - plays important roles in physical exertion, has high functional lability and responds quickly to even small demands, recommends it as an instrument in the research of cardiovascular and respiratory regulation processes.

The construction of a motivational strategy for attracting young people to sports activities, by renewing the programs and adapting them according to the level of training and health status had the effect of increasing the effort capacity of the students of the University of Bucharest.

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