



Science, Movement and Health, Vol. XIII, ISSUE 2 supplement, 2013  
September 2013, 13 (2), 479-485

## STUDY ON THE EVOLUTION OF MOTRICITY OF THE FEMALE STUDENTS WHO PRACTICE AEROBICS AT THE BUCHAREST UNIVERSITY

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### Abstract

*The purpose* of the research is to highlight the aerobics efficiency in relation to the evolution of the physical abilities in physical education classes taught to students from Bucharest University.

This endeavour was aimed at identifying the effects sought by the training programmes and the operational structures mainly intended for physical quality development, their effects being connected to the quantity and quantity of the changes at physical level.

The experimental statistical results are presented in graphical form.

The actual experiment consisted in the determination of the objectives and application of the training programmes for each group included in the research with the aim of developing the physical qualities by the specific means for each discipline.

Based on the processing and the intrinsic and comparative interpretation of the results obtained for the control tests, significant progress is identified upon the final testing is identified as compared to the initial one for both the experimental and control groups.

We may conclude that the operational structures have proved their effectiveness in relation to the physical capacity development in this age group.

*Key words:* motricity; female students; aerobics.

### Introduction

Increased demands of everyday life require from all areas of activity constant concern for improving their way of progress.

To properly conceive teaching design and especially to act appropriately in the teaching-learning process, the teacher must take steps to determine students' motor skills which they operate.

Knowing the motility potential of female students constitutes a permanent concern and ever topical of the specialists in our field.

The systematic analysis of motility potential of the students and its dynamics over time represent important landmarks, having major implications in developing operating strategies specific to physical education courses at non-profile schools.

By investigating the motility potential of female students, provides a deepening of specialized knowledge related to the drivability of the population.

In higher education, aerobics represents an effective form of optimization of the lessons performed with students, a means with multiple valences on the body.

The wide popularity it enjoys, especially among females, lies in the availability of the means used, the deployment framework and in particular beneficial effects on body harmony and the motive component, which is achieved by the correlation between movement, rhythm and the accompanying melody.

Coming from the French "motricité", motility

is based on the Latin word "motus",

According to the authors of the paper "Physical education and sports terminology" („Terminologia educației fizice și sportului"), the motility quality is an individual ability to perform movements expressed in indices of speed, strength, endurance, agility, mobility.

The motility quality is an acquired and perfectible characteristic with a resolution determined by the above-mentioned indices' specific.

### Methods

#### Tasks

This research aims, having as basis initial and final tests, to determine the motility development level for the Bucharest University students, who practice aerobics in physical education course.

Based on these tests, this research aims the evolution of the motility indices of these students.

#### Research purposes

- Investigation and analysis of motility development level of first year female students of the University of Bucharest, practicing aerobics in the academic year 2011/2012.
- Highlighting the efficiency of aerobic gymnastics in comparison with the evolution of motility parameters investigated.

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*Research objectives*

- Theoretical and methodological approach to the issue of motility capacity development;
- Scientific documentation;
- Developing the research program, organizational and methodological issues, determining subjects, research stages;
- Establishing research methods, initial and final testing, processing and valorization of the results obtained;
- Analysis of data obtained from research, development of methodologies and theoretical conclusions;
- Report any issues resulting from data analysis and the need to find practical solutions to remedy those issues;

*Research methods*

- Bibliographical study;
- Ameliorative type experiment;
- Measuring and testing method;
- Mathematical statistical method;
- Graphical representation method;

*Development of the research*

The experimental activity was conducted in the gym of the University of Bucharest, where the students were tested at the following:

1. Testing the speed through:  
Speed running a distance of 50 m flat, with standing start.
  2. Testing the explosive force of leg muscle through:  
Long jump without enthusiasm.
  3. Arm muscle strength test through:  
Pushups in the arms from facial lying.
  4. Abdominal muscle strength testing through:  
Vertical lift of the trunk from dorsal lying.
  5. Testing back muscle strength by:  
Extensions of the trunk from facial lying.
  6. Testing aerobic resistance by:  
Running for 12 minutes (Copper Test).
1. *Abdomen strength/30 sec*

Group	$\bar{X}_1$	$\bar{X}_2$	S <sub>1</sub>	S <sub>2</sub>	P	MC%
A	19,667	25,6	2,34	2,2	24,3	30,17
B	20,13	22,133	2,9	2,68	13,19	9,93

- Initial average values relatively equal;
- Great uniformity value for both groups (see standard deviation);

*Statistical indicators used:* arithmetic mean, median, mode, standard deviation, variance, range, coefficient of variation, the test student "t" dependent.

*Subjects:* subjects of our study, in number of 60 are freshman of the University of Bucharest aged 19-20 years who participated in aerobics class 2 hours per week.

The composition of the groups was done by voluntary adhesion; female students were presented the idea of differentiated activity.

To determine the effectiveness of the work carried differentiated with the experimental group we used a control group who preferred frontal activity in the basic course.

What differentiated the 2 groups was the system of organization of lessons: frontal activity in the control group and individualized in the experimental group. Differentiated instruction, involved taking into account several variables:

- Micro homogeneous groups composed on the basis of physical training (good, average and poor);
- Overweight micro groups;
- Micro groups with light vicious attitude;
- Micro groups made according to affinities (interest for certain types of lesson);

*Research hypotheses*

In conducting the research we have established the following assumptions:

- The motility capacity can be positively influenced using the specific means of aerobics.
- Optimization of motility capacity in aerobics lesson in higher education is determined by the use of modern methods of training opportunities (in our research using individualized training).

**Results**

*Statistical interpretation of the motility indicators*

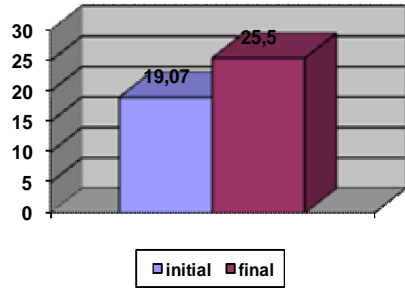
- Very high rate of progress in Group A (30.17%) and lower in Group B (9.93%);
- For Group A: t = 24,3 which implies that the difference between the averages is significant

and the null hypothesis is rejected at a confidence level of 99% (even 100%);

- For Group B:  $t = 13.19$  value that is higher than 2,756 recorded in column  $p = 0.01$ , the

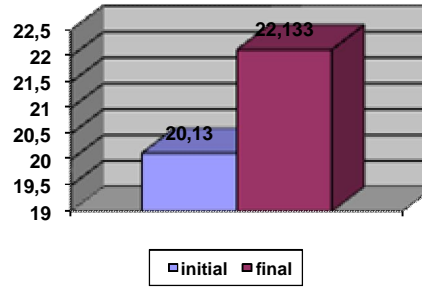
null hypothesis is rejected, but with a less significant difference than group A.

### 1. Abdomen strength



increasing 30,17 %

### 1. Abdomen strength



increasing 9,93%

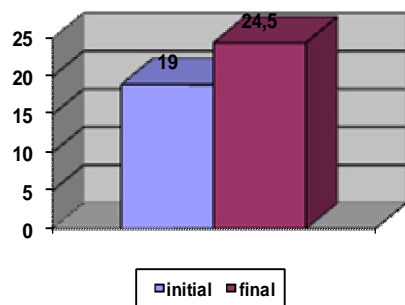
### 2. Back strength/30 sec

Group	$\bar{X}_1$	$\bar{X}_2$	$S_1$	$S_2$	P	MC%
A	19,8	24,5	2,68	2,46	17,56	23,74
B	20,33	22,4	3,26	2,7	11,15	10,17

- Back muscle strength is approximately equal in the initial stage;
- The homogeneity of the groups is also high;
- The rate of progress is much higher in group A (23.74%) compared to group B (10.17%);

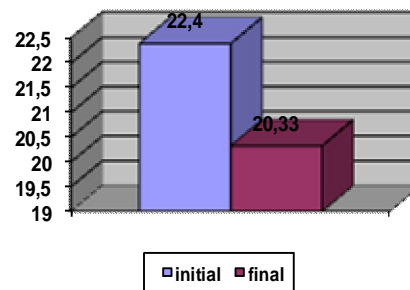
- For Group A:  $t = 17.56 > 2.756$ , the difference between the averages is very high, the null hypothesis is rejected;
- For Group B  $t = 11.15 > 2.756$ , the null hypothesis is rejected (with a difference less than group A).

### 2. Back strength



increasing 23,74 %

### 2. Back strength

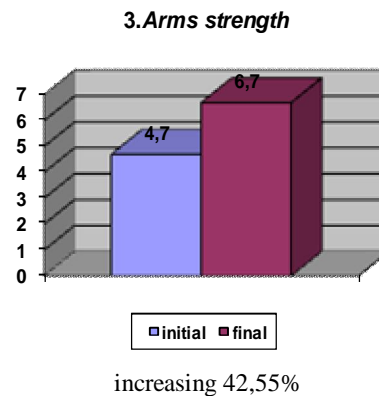
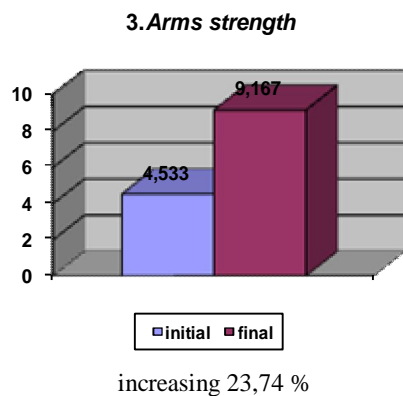


increasing 10,17%

### 3. Arms strength – pushups

Group	$\bar{X}_1$	$\bar{X}_2$	S <sub>1</sub>	S <sub>2</sub>	P	MC%
A	4,533	9,167	2,03	1,57	18,1	102,23
B	4,70	6,7	2,41	2,3	11,14	42,55

- Relatively equal arm strength in the initial stage of the experiment;
- The homogeneity of the values is high (homogeneous groups);
- Growth size is spectacular in group A (102.23%) compared to group B (42.55%);
- For group A: t = 18.1 which is much higher than the p = 0.01, the difference between these averages is of great significance, the null hypothesis is rejected;
- For Group B: t = 11.4, idem but with a smaller difference between the averages;

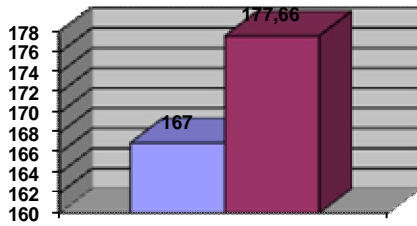


### 4. Long jump

Group	$\bar{X}_1$	$\bar{X}_2$	S <sub>1</sub>	S <sub>2</sub>	P	MC%
A	167	176,66	11,45	11,93	13,49	5,87
B	168,33	172,0	9,43	9,0	7,71	2,18

- Average values very similar in both groups at the initial stage, after which subjects of group A achieve higher performance (= 176.66) than those of group B (= 172.0);
- Standard deviation values show a better homogeneity in the control group B than in group A (experimental);
- For Group A: t = 13.49, p > 0.01, which means a significant difference between the averages, the null hypothesis is disproved;
- For Group B: t = 7.71 - idem, the null hypothesis is rejected;

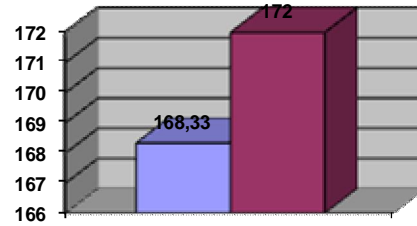
#### 4. Long jump



□ initial ■ final

increasing 5,78%

#### 4. Long jump



□ initial ■ final

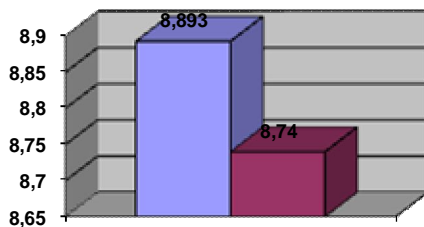
increasing 2,18%

#### 5. Running (50 m)

Group	$\bar{X}_1$	$\bar{X}_2$	$S_1$	$S_2$	P	MC%
A	8,89	8,74	0,59	0,55	-8,33	-1,72
B	8,67	8,6	0,44	0,4	-3,33	-0,77

- Average initial values equal for both groups, (A = 8.89 and B = 8.67);
- High uniformity around the average values in both groups;
- Greater improvement size in group A (-1.72%) than in group B (-0.77%);
- For group A:  $t = 8.33$  which is greater than 2,756 recorded in the column of  $p = 0.01$ , the null hypothesis is rejected;
- For Group B:  $t = 3.33$ , idem, but with a smaller difference from group A;

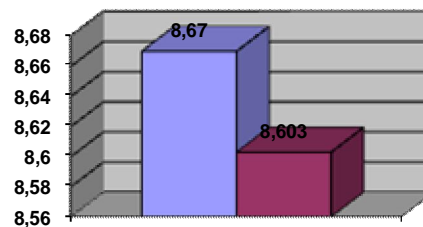
#### 5. Running



□ initial ■ final

increasing 1,72 %

#### 5. Running



□ initial ■ final

increasing 0,77 %

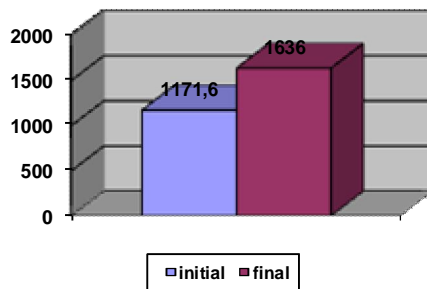
#### 6. Running 12 minutes - endurance

Group	$\bar{X}_1$	$\bar{X}_2$	$S_1$	$S_2$	P	MC%
A	1171,67	1636m	349,87	161,61	9,41	39,63
B	1158,60	1463,3	405,65	299,7	5,76	26,30

- Running for a period of 12min is a recognized test for the assessment of functional aerobic capacity;
- Very close initial average values , or A = 1171.67 and B = 1158.60 (that is a difference between the two groups of only 13,07 m);
- The size of growth of the average values is higher in group A (MC = 39.63%) compared to group B (MC = 26.30);

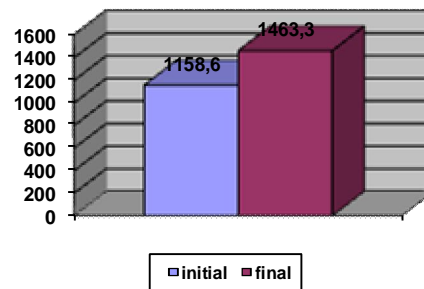
- The null hypothesis is rejected for both groups, respectively group A:  $t = 9.41 > 0.01$ , and for group B:  $t = 5.76 > 0.01$ . However the improvements produced in the experimental group are definitely higher than in the control group;

6. Endurance



increasing 39,63 %

6. Endurance



increasing 26,3 %

The results are presented in a logical sequence, through tables and diagrams. The results expressed through text should not be found in the tables and/or diagrams and the other way around.

### Discussions

The systematic analysis of potential motility of female students can be an important landmark in the development of specific strategies to operate physical education courses in the faculties of deadlock.

### Conclusions

1. The motility indicators system surprised through measurements, largely covers the screen of parts that go into physical composition structure, considered (at global mode) with the predominant purpose of the systematic practice of aerobic gymnastics. Thus, are included segmental force indicators (back, abdomen, arms) which provide information on the relative strength (respiratory strength kg / body) speed and power under speed, functional aerobic capacity, etc.
2. Both groups improve their initial parameters value as a result of applied training programs. However, the amounts of growth made by the experimental group are significantly higher than in control group.
3. The experienced teaching project which predicted the transition from frontal training to group and individual training was more

effective than that which has been prepared by the control group subjects.

4. An important role in achieving superior results by the experimental group had the application of the differentiation and awareness of the activity. In this respect, each subject was aware of the shortcomings of order motility that she has, the goals and purposes they have to perform, according to which were established operational structures (systems of exercises and methods) that were practiced systematically in their free time.
5. Activity in smaller groups (mini groups) and even in couples made based on the values criterion, on aspirations or on affective relationships, led both to improve group social relations and to increase Actual motility indicators.
6. The most significant evidence for educating the functional aerobic capacity (for subjects of both groups) has been running for 12 minutes. Here the difference between the growth sizes for the two groups is obvious (31.63% versus 26.30%). We tempt to say this difference was achieved both through a better body adaptation to the demands of medium intensity that requires the test, but also the psychological order such as the fortitude, the desire for self-improvement, active involvement in work and so on.
7. Generally systematic practice of aerobic gymnastics submits the students to a work performed under specific pleasant ambience



- (music, relationships with partners, organizational framework, etc.) which favor the habit of making physical efforts or to work. This skill becomes a habit that is involved in leisure activities (as a countervailing concern).
8. Our research has revealed useful information on the level of motility of female students motility who practice the aerobics class. After the experiment it was found that especially strength and endurance development can be done by means of aerobic gymnastics.
  9. Both the experimental group and the control had higher averages at the final testing than the baseline for each indicator in question, but in different proportions. The progress of the experimental group compared to the control one, proves the efficiency of methodical processes and aerobics programs used for the experimental group.
  10. After the experiment it could be determined a system of ways and means to act effectively in order to increase motility parameters of

female students, which is actually the purpose of the work.

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