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CONTRIBUTIONS TO PHYSICAL DEVELOPMENT THROUGH SPECIFIC AEROBIC GYMNASTICS MEANS

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Abstract: *The aim of the study was to highlight the contribution of aerobic gymnastics to the harmonious physical development of students. This experiment is part of a wider experiment where we started from the hypothesis that the use of aerobic gymnastics in physical education lessons, which involves different movements of body segments in varied combinations with specific base steps, all carried out in a program involving a predominantly aerobic effort, will bring much more rapid and visible changes to the physical development of the students. The experiment was carried out on a group of 32 female students from the second year of study at the Faculty of Economics and Public Administration, at Ştefan cel Mare University of Suceava. Experimental group against which the independent variable was applied was made up of 16 students, and the control group prepared by traditional means was also made up of 16 students from the same specialty in another study group. At the end of the experiment, the results highlighted the fact that there are significant differences (by calculating t test) between the initial and the final results at all the morphological parameters measurements in the case of the experimental group.*

Keywords: *somatic indices, students, improvement, aerobic gymnastics, physical education and sport lesson.*

Introductions

From a terminological point of view, gymnastics is a complex system of exercises with beneficial action on the body, and the aerobic word means high oxygen consumption for a long time. According to Chera - Ferrario, B., (2010, p.7) "aerobic gymnastics includes a system of exercise, conducted with high oxygen consumption, following the development of the body and its maintenance in an optimal state of functioning, nervous system relaxation, good mood, grace, elegance in movement and musicality."

Aerobic gymnastics is a maintenance gymnastics that is an integral part of the aerobic exercise system and is performed with musical accompaniment. Aerobic gymnastics involves a complex of exercises from basic gymnastics and dance steps with musical accompaniment. Aerobic gymnastics uses analytical movements of body segments in different directions and plans, amid an aerobic effort. (Ganciu,M., Ganciu, O,M., 2013, p.117). Aerobic exercises are "dynamic movements with a specific rhythm, made with musical accompaniment, in an aerobic exercise mode, with segmental and combined locations, providing a dynamic succession of movements without static breaks. Ensuring the intake of oxygen necessary to sustain the effort is achieved by breathing coordinated with the structure of the movements."(Ganciu, M., 2009, p.12).

The formative nature of aerobic gymnastics results from their ability to put into practice their accumulated knowledge under various conditions. Aerobic gymnastics creates a psychophysical balance and compensates for the negative effects of sedentarism. Performing variation of steps requires good neuro-muscular coordination, flexibility, balance, orientation in space. Aerobics can solve many of the physical and health problems. By Dobrescu, T, (2008), Ganciu, M., et al., (2013, pp.118-122), Pop, C., L., et al., (2015, pp.155-156), Ferrario, B, (2010, p.7), Macovei, S., (2007), the effects of aerobic gymnastics are: reduce body weight; increases vital capacity and improves pulmonary elasticity; favors the body's adaptation to effort; trains aerobic resistance and force; develops coordination; increases self-control of motion.

Exercises in aerobic gymnastics are means that are mostly addressed to students. Aerobic gymnastics creates some of the most attractive physical education lessons. Means are accessible and include basic steps, dance steps combined with movements in different directions and planes of the arms and legs. Initially the rhythm is initiated by the teacher, and after a period of preparation, the students will initiate the movements themselves.

Material and method

Hypotheses of the research: This experiment is part of a wider experiment where we started from the hypothesis that the use in aerobic gymnastics physical education lessons which involves different movements of body segments in varied combinations with specific base steps, all carried out in a program involving a predominantly aerobic effort, will bring much more rapid and visible changes to the physical development of the students.

The purpose of the research: The aim of the study was to highlight the contribution of Aerobic Gymnastics

in the harmonious physical development of students.

Subjects of research: The experiment was carried out on a group of 32 students from the second year of study at the Faculty of Economics and Public Administration, at Ştefan cel Mare University of Suceava. The experiment group against which the independent variable was applied was made up of 16 female students, and the control group prepared by traditional means was also made up of 16 female students from the same specialty in another study group. The experiment was conducted during an academic semester of study.

The research methods: method of study of specialized literature, anamnesis, observation method, experiment method, methods of collecting and interpretation of data.

The means used in research: Aerobic exercise programs included variants of walking and running in various combinations with specific base steps such as: march, jog , knee, kick, lunge, jumping jack, add steps, cross steps, 360 degrees turn around etc. The duration of an aerobic exercise program was 50 to 60 minutes. It has always been on music. The program consisted of three parts: the warm up part, the main part of the aerobic exercises and the cool down part.

Results

After the introduction of the aerobic gymnastics in the physical education lessons to the students in the experiment group, the differences in the values resulting from the tests were as follows:

Table 1 – Experimental group

	Weight		Waist circumference		Hip circumference		Thigh circumference		BMI	
	I.T	F.T	I.T	F.T	I.T	F.T	I.T	F.T	I.T	F.T
X	59.81	55.06	69.31	65	98.5	95.56	51.56	46.12	22.45	20.83
S	5.87	5.27	4.71	3.84	5.84	4.30	7.46	6.48	2.22	1.54
CV	9.82	9.57	6.80	5.91	5.93	4.50	14.47	14.06	9.89	7.43
Median	58.5	52.5	70	65.5	98.5	95.5	53	46	22.4	20.4
Mo	66	60	70	65	92	98	47	49	19.8	20.4
Min	50	49	60	59	90	90	39	37	18.9	18.9
Max	71	66	76	71	112	107	63	58	26.3	25.2
Amplit.	21	17	16	12	22	17	24	21	7.4	6.3
t	**2.41 > 2.13**		**2.83 > 2.60**		**1.62 < 2.13**		**2.20 > 2.13**		**2.39 >2.13**	
p	**p < 0.05**		**p < 0.02**		**p > 0.05**		**p < 0.05**		**p < 0.05**	

Table 2 – Control group

	Weight		Waist circumference		Hip circumference		Thigh circumference		BMI	
	I.T	F.T	I.T	F.T	I.T	F.T	I.T	F.T	I.T	F.T
X	59.37	58.12	67.12	65.5	98.37	98.12	50.56	49.75	22.15	22.31
S	6.14	6.47	3.72	3.74	6.34	6.86	7.42	6.41	2.07	2.08
CV	10.34	11.14	5.54	5.71	6.44	7.00	14.67	12.89	9.35	9.36
Median	57.5	55.5	67	66	97.5	96.5	49.5	48.5	22.2	22.25
Mo	55	55	70	66	102	90	50	44	22.1	21.19
Min	50	50	60	60	90	90	38	40	18.8	18.9
Max	69	70	74	70	109	110	63	64	25.9	25.4
Amplit.	19	20	14	10	19	20	25	24	7.1	6.5
t	**0.56 < 2.13**		**1.23 < 2.13**		**0.10 < 2.13**		**0.33 < 2.13**		**0.22 < 2.13**	
p	**p > 0.05**		**p > 0.05**		**p > 0.05**		**p > 0.05**		**p > 0.05**	

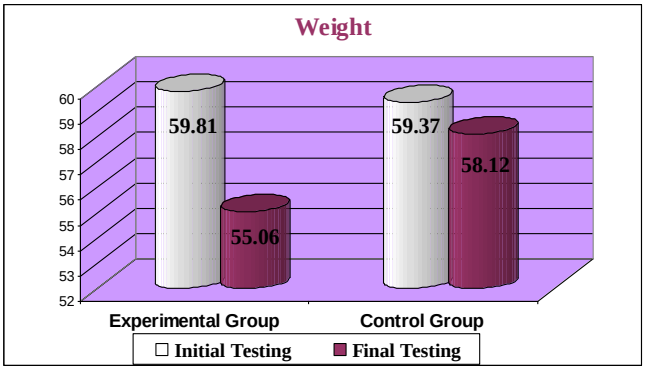

Figure 1. Initial and final values – weight

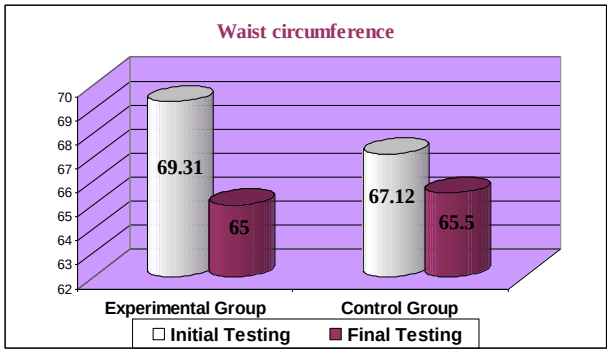

Figure 2. Initial and final values – Waist circumference

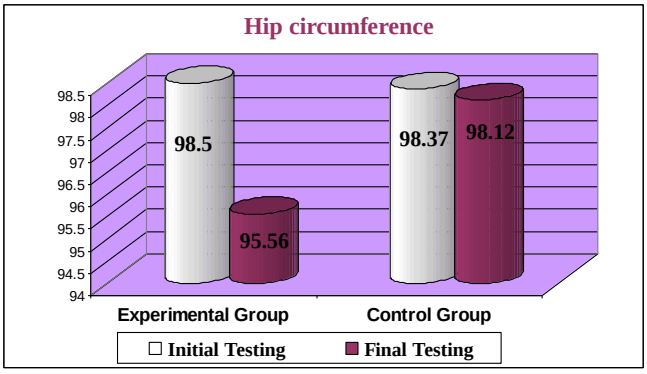

Figure 3. Initial and final values – Hip circumference

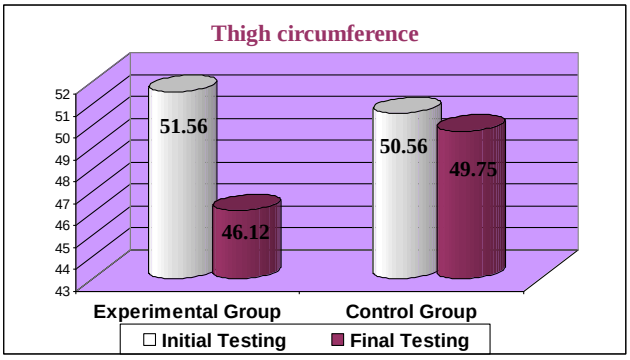

Figure 4. Initial and final values – Thigh circumference

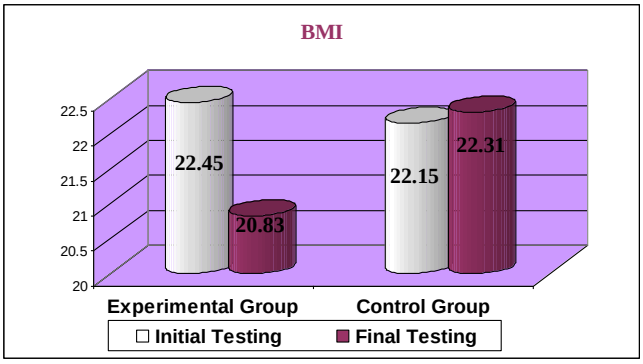

Figure 5. Initial and final values – BMI

Conclusions

At the end of the experiment, the results highlighted the fact that there are significant differences between the initial and the final results at all the morphological parameters measurements in the case of the experimental group. In the case of the experimental group, for all measurements of the somatic indexes, the calculated values t were higher than the values of the variable *t* in the *Ficher table* (at significance thresholds 0.05 and 0.02 at degree of freedom n-1 = 15), while in the control group, the results between the initial and the final results were not statistically significant. Observing the graphical representations, it is noted that there are differences between the initial and the final tests, which means that the aerobic gymnastics had important contributions.

The attractiveness and dynamism that characterizes aerobic gymnastics has led students to be more active and more involved in physical exercise. After all the experimental approach, we can confirm the established hypothesis and highlight that aerobic gymnastics can be used successfully during the physical education classes with the young students.

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