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Original article

AEROBIC GYMNASTICS ON KANGOO-JUMPS BOOTS AND ITS IMPACT ON STUDENTS' FITNESS

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Abstract

Aim. This work, with profound nature of research aimed at the upgrading the physical education class in the upper tier of education, where the attractiveness of the proposed means of combating the underlying teacher absenteeism. The purpose of research is to validate new work programs developed to improve the quality of life of women students, in their structure programs that have specific aerobic gymnastics means the Kangoo-Jumps boots, to implement them in physical education class.

Methods. For 8 months, a group of 15 subjects participated in weekly hours of physical education sessions that were held on Kangoo-Jumps aerobics. They were tested before and after implementing the work programs, monitoring the evolution of anthropometric parameters, functional indices and strength in the legs, abdomen and back.

Results. At the end of the research, the subjects progressed to all the tests and the tests conducted, tests the differences between the initial and final averages being statistically significant at a threshold of $p < 0.05$ for both experimental and for the control group. However, significant differences between the groups were recorded especially in the legs and abdomen force in favor of the experiment group.

Conclusions. The aerobic gymnastics lesson on Kangoo Jumps Boots, has proven extremely attractive and useful in the bio-psycho-social development of young students interested in practicing such a form of exercise, the interest being manifested by other students, also. Unfortunately, mass expanding these exercises hits a big impediment in financial terms, the cost of such shoes being quite high.

Key Words: Kangoo-Jumps, students, aerobic exercise

Introduction

In the complex process of students education and training, physical education occupies a worthy place in the formation of their multilateral personality, aerobics being a preventive and compesator tool, relaxing and also a drive for the great functions of the body, with both prophylactic and therapeutic role to prolong an active life and a healthy lifestyle through movement. Forming itself as a psycho-pedegogic system, gymnastics has evolved with the development of human society, each time trying to bring news in this discipline in order to improve and increase the attractiveness of aerobic gymnastics. Gymnastics Kangoo-Jumps on aerobics shoes is equipped with elliptical arcs and bands stretching, combining aerobic exercise, tae bo and jogging. Orţănescu (2002)., notes that not always aerobic activity is supported by beliefs about the importance of movement for the body in its entirety as it is known, though it cannot be expressed correctly, but regardless of their content it is an activity performed rhythmically. Although many trainees have general knowledge about the importance of exercise, their beneficial effects to the body, they cannot clearly define the concept of "active lifestyle".

The motivations underlying their participation are knowledge and beliefs of more aesthetic order.

Our desire is to demonstrate that attractive work programs to be proposed, combining modern means of gymnastics alongside traditional ones can contribute to the improvement of motor and functional capacity of non physical education students.

Kangoo Jumps cannot be regarded as an independent form of aerobics, because it does nothing specific, but only implements all classic aerobic exercises on boots with elastic springs on some increasing dose of fun and efficiency and eliminating eventual boredom that might appear in the gymnastics sessions aerobics, an agreed fact by students, which is always open to innovation and

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novelty.

On training, Kangoo Jumps boots- improve aerobic capacity, and reduce the injury rate more than in normal training shoes. (Miller et al., 2015). There are also studies that show that using Kangoo Jumps boots bacame favorable outcome for postural balance. (De Oliveira et al., 2014)

The aim of the research aims to validate unique attractive and effective work programs, by combining modern means of gymnastics alongside traditional ones to improve the quality of life of non physical education students.

In this regard, the theme chosen seeks to find the best strategies that lead to more efficient solving of physical education tasks through diversification with specific aerobic gymnastics means introducing the work programs and specific exercises performed on boots Kangoo Jumps, and the effects of these exercises on the quality of student life.

Methods

This research included a sample of 30 subjects divided into two groups (experimental and control - 15, 15), of students in the University of Craiova. In the period October 2013-May 2014 work programs that had developed in its structure means specific work-aerobic gymnastics Kangoo Jumps boots were applied to experiment group , once a week, lasting 60 minutes. The monitoring group has worked in the same period physical education lessons centered on classical aerobics programs, their frequency being weekly, with the same duration as the experiment group.

All subjects have agreed to voluntarily participate in this study. Subjects were tested before and after implementing the work programs, the results achieved are analyzed and compared between the control group and the experiment one, to demonstrate the effectiveness of the means used in our research functionally and from the motor capacity perspective, being tested anthropometric parameters (BMI), functional (heart rate), power (force legs, abdomen, back and front flexibility). The motor tests were:

a) **Long standing Jump - lower limb strength**. The subject is placed in a line on the ground with legs slightly apart, running at a maximum jump on two feet in length with strong arms balance (arms elk). The test recorded the best jump length in two attempts. The test does not take into account falling or jumping from stepping detachment. Purpose: To measure the explosive power. Common mistakes: Hard landing, loss of balance, repeated arms balancing.

b) **Bending the trunk forward - anterior-posterior mobility**. From the standing position at the end of a gymnastics bank (where we shall fix a graded line with the 0 level next to the performer feet), Perform the torso bending forward with arms down, knees straight, so the palms slipping as much on the graded line. Results: The examiner records the number of centimeters touched; from 0 level up gradation values are positive and negative values down. Common mistakes: bend your knees during construction, the arms are not perfectly flat and performs abrupt movements.

c) **Raising the trunk from lying - abdominal strength**. From lying down with hands behind your head, lift the torso 45 degrees for 30 seconds. **Results** The numbers of repetitions are counted. We made the statistical analysis through the SPSS V.21 statistical program (Statistical Package for Social Sciences) a program that has enabled mathematical statistical indices such as arithmetic mean, standard deviation, minimum and maximum value.

Results

Regarding the body mass (Table 1), the experiment group body weight recorded in the initial testing an average of 60.42 (S ± 6.59), the measurements ranging between 50 and 74 kg, this parameter decreasing to final testing at 57.36 kg (± 6.59). In the control group the average from the first test is 58.88 kg (± 4.16) and 57.58 kg in the second.

Applying the Student test for each group, the following values were achieved-for the experimental group - a value of t (5.950), degrees of freedom (11) and bidirectional level of significance ($p < 0.05$). Since the significance level is 0.001, a difference of the two tests is highly significant.

The confidence interval ranges between 1.92 and 4.18 and since passing through 0 levels, the difference is statistically significant at the 5% bidirectional level significance.

For the control group the t value is (3.72), the degrees of freedom (11) and the bidirectional level of significance ($p < 0.05$) the level of significance is 0.03, resulting that this difference is significant. The confidence interval ranges between 0.53 and 2.07 and since passing through 0 level, the difference is statistically significant at the 5% significance bidirectional. In the final testing, the general mean of the experiment group has a breakthrough of 5.06% and 2.20% of the control group, demonstrating that through the means applied we achieved a decrease in body mass.

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Table 1. Statistical parameters for anthropometric indices, body mass

	Experiment group		Control group	
Parameters	**T_1**	**T_2**	**T_1**	**T_2**
Arithmetic mean	60.42	57.36	58.88	57.58
stdev	6.59	5.36	4.16	4.23
cv	10.90	9.34	7.07	7.35
max	50	50	50.4	49
min	74	68	67	65
amplitude	24	18	16.6	16

In table 2 the body mass index of the experiment group in the initial testing recorded a value of 22.10 (S ± 1.85), with a maximum value of 25.6 which sends the respective subjects at the degree of overweight, this parameter decreasing to final testing to 21.03 (± 6.59) values ranging between 18.6 and 23.5. In the control group the average from the first test is 21.81 (± 1.31) and 21.33 (± 1.40) in the second evaluation.

Applying the Student test for each group, the following values in the experimental group are achieved through a value of t (5.93) degrees of freedom (11) and at the bidirectional level of significance ($p < 0.05$). The control group's value t (3.61) the degrees of freedom (11) and the bidirectional level of significance ($p < 0.05$) the level of significance is 0.04, resulting that this difference is significant.

In the initial testing, the overall average of the experiment group is 1.28% (0.28) than the control group, the body mass index decreasing along with the conducting work programs, reaching 0.3 in the final test lower compared to the control group. The body mass index is a parameter recommended by the World Health Organization in monitoring health status as positive, in our research being positively influenced by the application of the aerobic gymnastics on KJ Boots programs.

Table 2. Statistical parameters for anthropometric indices, body mass index

	Experiment group		Control group	
Parametrers	**T_1**	**T_2**	**T_1**	**T_2**
Arithmetic mean	22.10	21.03	21.82	21.33
stdev	1.85	1.54	1.31	1.40
cv	8.36	7.33	6.00	6.58
max	19.8	18.6	19.7	19.1
min	25.6	23.5	24	23.8
amplitude	5.8	4.9	4.3	4.7

The long jump (table 3) recorded for the subjects of the experiment group, in the initial testing, an average of 153.00 cm (S ± 12.10), the maximum being 172 cm and the minimum 130cm. In in the final test, the lower limb strength increases, the averaging 160.50cm (S ± 10.52), the values ranging between 145cm and 178cm. In the control group the average from the first test is 155.42 (± 7.54) and 158.08 (± 7.68) in the final test. The progress for the experiment group is 4.90% (7.5 cm), while in the control group is 1.71% (2.66cm).

Applying the Student test for each group, the following values are obtained: the experimental group achieved a value of t (-8035), degrees of freedom (11) and bidirectional level of significance ($p < 0.05$). The control group's value t (3.61) degrees of freedom (11) and bidirectional level of significance ($p < 0.05$) significance level is 0.04, resulting that this difference is significant. On the initial testing, the overall average is 2.42 for the experiment group (1.55%) lower than the control group, the values increasing in length jump to experiment group by 2.5 cm compared to the control one.

Applying Student test for independent samples we obtained a final average difference between the experiment group and the control strongly statistically significant at a threshold of $p < 0.001$. The results achieved confirm the effectiveness of new programs designed and implemented for the experiment group through which the lower limb strength was improved.

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Table 3. The statistical parameters for the long standing jump

	Experiment group		Control group	
Parameters	T_1	T_2	T_1	T_2
Arithmetic mean	153.00	160.5	155.42	158.08
stdev	12.10	11.39	7.54	10.52
cv	7.91	7.22	4.85	6.55
max	130	136	140	145
min	172	178	162	178
amplitude	42	42	22	33

The abdominal strength (table 4) recorded at the initial testing, in the experiment group a value of 26.17 repetitions (S ± 2.76), the maximum being 30 and the minimum 22 repetitions reps. In the final test, the average of rises the trunk from lying increases to 31 (± 2.70), the values were between 28 and 36 lifts. In the control group, the average of the first test is 26.67 (± 1.61) and 27 (± 1.21) in the final test.

The progress for the experiment group is 18.45% (about 5 repetitions), while in the control group is 1.23% (less than 1 repeat). Applying the Student test for each group, the following values were recorded: the experimental group achieved a value of t (-13.21), degrees of freedom (11) and bidirectional level of significance ($p < 0.05$. The control group value t (-1.77), degrees of freedom (11) and bidirectional level of significance ($p > 0.05$), the significance level is 0.104, with the result that this difference is not significant. If in the initial testing, the control group recorded higher average 0.5 repetitions than the experiment group at the end, as a result of the work programs aimed especially at the abdominal area, is progressing 14.81% for the experimental group subjects. Applying the Student t test for independent samples, we recorded a final average difference between experiment group and the control statistically significant ($p = 0.00014$) at a threshold of $p < 0.05$.

Table 4. Statistical Parameters for abdominal strength

	Experiment group		Control group	
Parameters	**T_1**	**T_2**	**T_1**	**T_2**
Arithmetic mean	26.17	31.00	26.67	27.00
stdev	2.76	2.70	1.61	1.76
cv	10.54	8.70	6.05	6.51
min	22	28	25	24
max	30	36	29	30
amplitude	8	8	4	6

In table 5, in the experiment group, there is in the initial testing a mean value of 0.08 cm for the anteroposterior mobility (S ± 3.06), the maximal and the minimum 5cm -5cm. In the final test, the average increased to 5,42cm (± 3.48), the values were between 1 and 12cm. In the control group, the average in the initial testing is 0,17cm (± 3.51) and 2,75cm (± 2.95) in the final test. The progress for the experiment group is 5 cm, while in the the control group is 5.75cm. Applying the Student test for each group, the following values were obtained: in the experimental group is achieved through a value of t (-13,479), the degrees of freedom (11) and at the bidirectional level of significance ($p < 0.05$). The value of t for the control group was -16.82, the degrees of freedom (11) and the two-way significance ($p < 0.05$).

In the experimental sample aimed at the anteroposterior mobility in the initial testing, the values are quite similar for both groups, with an advantage for the control group. In the final test, we obtained a difference of 0.75cm for the subjects of the control group. Applying the Student test for independent samples we obtained in final average a difference between the experiment group and the control group not statistically significant at the a threshold of $p > 0.05$.

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Table 5. The statistical parameters for anteroposterior mobility

	Experiment group		Control group	
Parameters	**T_1**	**T_2**	**T_1**	**T_2**
Arithmetic mean	0.08	5.42	0.17	5.75
stdev	3.06	3.48	3.51	3.93
min	-5	1	-5	-2
max	5	12	6	8
amplitude	10	11	11	10

Regarding the heart rate (Table 6) presents both the initial test and the final test relatively close to the subjects of the two groups. Thus, the experimental group, the mean value is 80.92 ± 1.38 beats per minute for the first test and 76.75 ± 1.14 b / m in the second test, the control group recorded 80.33 ± 0.33 b/m to in the initial testing and 77.25 ± 0.87 b / m final. Applying Student test for each group, the following values were obtained: In the experimental group - a value of t (10.68), degrees of freedom (11) and bidirectional level of significance ($p < 0.05$). In control group -the value of t (11.86), degrees of freedom (11) and bidirectional level of significance ($p < 0.05$). Both groups had a positive development concerning changes in heart rate after taking part in the aerobics sessions with or without boots.

Table 6. The statistical parameters for the heart rate at rest

	Experiment group		Control group	
Parameters	**T_1**	**T_2**	**T_1**	**T_2**
Arithmetic mean	80.92	76.75	80.33	77.25
stdev	1.38	1.14	0.89	0.87
cv	1.70	1.48	1.10	1.12
min	79	75	79	76
max	83	78	82	79
amplitude	4	3	3	3

Heart rate testing shows, after exercise, for the the experiment group, a mean value 138.42 ± 2.07 bpm at the first test and 133.25 ± 2.80 b / m in the second test. The Control Group recorded 137.08 ± 1.88 b / m and 133.83 in the initial testing ± 1.34 b / m final.

Applying the Student test for the each group, the following value were obtained - In the experimental group we achieved through a value of t (10.90), the degrees of freedom (11) and at the bidirectional level of significance ($p < 0.05$). In the control group- the value t (8.74) the degrees of freedom (11) and the bidirectional level of significance ($p < 0.05$).

Discussion

The latest research period puts great emphasis on improving the quality of life and there is increasingly more information on the impact of in motor. (Dumitru, 2013).

Aerobics enjoyed wide popularity, especially among females, due to the availability of the means used, deployment framework, and in particular, the beneficial effects on the body and the harmonious development of bio-psycho-social status, which is achieved through consistency of movement, rhythm and musical accompaniment.

So, aerobics is a means of multiple effects on the body and an efficient way to optimize physical education lessons for teaching.

With the continuous development of society, the activities of humans, become increasingly organized in nature, they are determined by individual needs, social and, of course, periods features that pervade humanity in transformation so that physical education is conform and adapted to the current requirements of society, of developments in modern art. The interest shown in recent years aerobic gymnastics, for the objective continuous improvement of this activity among students as an accessible and effective means for multilateral preparation, training and educating the younger generations are enough reasons for which, today, aerobics is in the first places rankings, popular among students, and especially women students

regarding the conduct of physical education classes. (Nanu, 2009).

Recently it was shown that the younger generation had a great attraction to the relatively new sport disciplines (Kangoo Jumps-Tae Bo, Pilates, Skateboard, dance etc.) so that we can conclude that the physical education teacher must meet the requirements of students, providing an organized setting for the new study contents. Anthropometric measurements highlighted the positive impact of aerobic gymnastics on Kangoo-Jumps boots on the the subjects' body weight and body mass index. The program also developed was validated by the results achieved in motor tests by the subjects of the experiment group, the testing differences between initial and final averages are statistically significant at a threshold of $p < 0.05$, the influence of aerobic gymnastics Kangoo Jumps boots specific means- are recorded especially in the legs and abdomen.

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