IMPROVEMENT OF FUNCTIONAL PARAMETERS BY INTRODUCTION MARTIAL ARTS TECHNIQUES IN THE PHYSICAL EDUCATION AND SPORTS LESSONS

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Abstract

Tae bo is a combination of martial arts, boxing, and other fitness moves, all performed on music. Tae bo is an aerobic workout beneficial for the cardiovascular and respiratory system. In the present research, we started from the hypothesis that teaching martial arts techniques and combining them with other motor structures, in an aerobic program performed on music, will lead to the improvement of the functional indices of the students from the experimental group. The experiment and control group were made up of 24 subjects (N=24, undergraduated female students), from the Accounting and Management Informatics specialization. The research was carried out during a university semester (14 weeks) and at the end it was shown that the kicks and the punches performed on all trajectories, have had beneficial effects on the cardiovascular and respiratory systems.

Introduction

Tae bo is a successful combination of martial arts, boxing and other fitness movements, developed in the US in the 1980s by American Taekwondo sportsman Billy Blanks. Tae bo is an aerobic training method that benefits the cardiovascular and respiratory system, improves coordination and develops body muscles [4], (p.150).

Tae Bo's programs combine martial arts and gymnastics, all performed on music. Punching, kicking and kneeling and other movements are borrowed from different styles and require all muscle groups in an aerobic type program. Tae Bo is not intended for combat, but was designed to increase physical fitness through various dynamic movements meant to require all muscles.

In Tae Bo, every hit and combination starts from one position (high guard position, side guard, base position with the legs far apart and flexed from the knees, the lateral base position, etc.). When the position is done correctly, the muscles of the thighs, abdomen and legs will be

influenced, it will provide balance, accuracy, power, fluidity and safety in the practice of specific exercises [7], (pp.22-32).

The kicks (direct, lateral, circular, backward, etc.) are the most impressive moves in Tae Bo. These are also the heaviest and most demanding movements that involve all the muscles of the legs and body. According to [7], (pp.78-79), the movements in Tae Bo that train the other muscles (thorax) are centered on four tips of punches: direct punch, cross punch, uppercut and cross. In a Tae bo training, there are a lot of punches, reaching up to 400, on different trajectories.

Punches are performed in combination with kicks, knees, jumps, turns, dodges and different basic steps specific to aerobics. Punches techniques are very similar to the boxing techniques. Other techniques in Tae Bo are elbow strikes that are considered to be the most dangerous (natural weapons) blows and can be executed in several forms: direct, lateral, backward, circular elbow strike.

In the aerobic programs of tae bo you can also introduce locks similar to those used in the martial arts. In these case hands are used as defense tools to deflect imaginary attacks. They are rhythmically executed, on different trajectories (from top to bottom where the elbow covers the face, from bottom to top), the side locks where the hands are held to protect the head and the forearms are hidden from the trunk, etc.

Material and method

In this article we have presented the results of more extensive studies, which lasted for a period of 3 years [5], [6]. The purpose of this research is to demonstrate if the programs developed by us for the discipline of physical education and sports can influence the functional indices of the students from the faculties with non-sports profile (economic profile). The experiment group was made up of 24 subjects (N = 24, undergraduated female students), in the second year of study, in the accounting and management informatics specialization and the control group was also made up of 24 subjects from the same year (N = 24, undergraduated female students). The subjects are between 19 - 21 years.

Hypotheses: teaching martial arts techniques and combining them with other motor structures, in an aerobic program performed on music, will lead to the improvement of the functional indices of the students from the experimental group.

The research methods: method of study of specialized literature, method of analysis, test and measurement method [1] graphical method, tebel method, statistical and mathematical method [3].

Means used in research: the means proposed by us include: basic positions, specific steps and movements, walking and running [2] variants, punching (direct, diagonal, circular and bottom up), elbow techniques (circular, lateral and top to bottom), foot techniques (frontal, lateral, circular kick, backwards from the lateral guard position), knee techniques (direct, lateral and standing kick on a knees), all in simple connections and combined with movements in different directions and planes of the arms and legs, jumps, turns, etc.

Results

After the functional assessment, we calculated several statistical indicators presented in Tables 1 to 4.

Table 1 Dynamics of statistical indicators – Heart rate

Statistical indicators	Experiment group		Control group	
	Initial t.	Final t.	Initial t.	Final t.
x	85.08	83.37	84.83	84.62
Median	84	81.5	85	84.5
Mo	80	80	90	92
Min	67	72	69	72
Max	100	97	101	97
Ampl	33	25	32	25
S	8.20	7.07	9.59	7.51
CV%	9.64	8.48	11.31	8.87
t	0.77 < 2.07		0.08 < 2.07	
p	p > 0.05		p > 0.05	

In the experimental group there was a decrease in heart rate of 1.71 beats / minute on average, whereas in the control group a decrease of only 0.21 beats / minute (table 1).

Table 2 Dynamics of statistical indicators – Ruffier Test

Statistical indicators	Experiment group		Control group	
	Initial t.	Final t.	Initial t.	Final t.
x	12.27	10.31	12.25	11.31
Median	12.45	10.35	11.65	11.15
Mo	11.3	13.7	16.5	8
Min	7.1	6.3	5.2	6.3
Max	16.7	14.7	16.6	15.3
Ampl	9.6	7.4	11.4	9
S	3.28	2.67	3.57	2.83

CV%	26.77	25.96	29.18	25.07
t	2.26 > 2.07		1.00 < 2.07	
p	p < 0.05		p > 0.05	

In the Ruffier test, the subjects of the experiment group improved their results by 1.96 points, compared to the control group, which registered a difference of only 0.94 points. At the initial testing, 29.17% of the subjects in the experiment group received the weak rating (poor physical condition), and at the final testing the percentage decreased to 0;

Table 3 Dynamics of statistical indicators – Harvard Test

Statistical indicators	Experiment group		Control group	
	Initial t.	Final t.	Initial t.	TF
x	63.86	68.15	64.09	65.25
Median	63.79	68.18	63.79	64.94
Mo	62.69	65.71	63.42	62.69
Min	58.65	62.69	58.02	59.28
Max	69.04	74.71	70.83	71.77
Ampl	10.39	12.02	12.81	12.49
S	3.39	3.66	4.03	3.33
CV%	5.30	5.37	6.29	5.11
t	– 4.20 > 2.81		– 1.08 < 2.07	
p	p < 0.01		p > 0.05	

In the Harvard test, the experiment group achieved a progression of 4.29 points and the control group 1.16 points. At the final test, 29.17% of the subjects in the experiment group obtained above average values, and in the case of the control group only 4.17% (table 3).

Table 4 Dynamics of statistical indicators – Blood pressure

Statistical indicators	Experiment group				Control group			
	Systolic blood pressure		Diastolic blood pressure		Systolic blood pressure		Diastolic blood pressure	
	IT	FT	IT	FT	IT	FT	IT	FT
x	124.12	122.87	74.58	75.62	126.20	124.37	77.33	77.83
Median	125	121.5	74	74	124.5	122	77.5	79
Mo	119	120	69	72	136	122	80	82
Min	113	112	67	70	111	112	68	70
Max	142	138	87	84	141	138	86	84
Ampl	29	26	20	14	40	26	18	14
S	7.42	7.12	5.81	4.39	8.98	7.97	5.70	4.54

CV%	5.98	5.79	7.79	5.80	7.12	6.41	7.38	5.84
t	0.59 < 2.07		– 0.70 < 2.07		0.74 < 2.07		– 0.33 < 2.07	
p	p > 0.05		p > 0.05		p > 0.05		p > 0.05	

Systolic and diastolic blood pressure did not show significant changes during the training period in any of the groups (table 4).

Conclusions and discussions

Following the measurement of the functional indices and the evaluation of the aerobic capacity of the students, at the beginning and at the end of the experiment, an improvement of the values of the subjects of the experimental group was observed. In the case of the experiment group, in the Ruffier Test and Harvard Test, the calculated *t-values* were higher than the critical *t-values* at the 0.05 and 0.01 significance thresholds, the differences between the averages being statistically significant, $p < 0.05$ and $p < 0.01$.

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