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The impact of physical activities of aerobic type in body mass and volume parameters

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Abstract

The aim of the paper was to prove the impact of aerobically programmed physical activities on body mass and volume and reducing the ratio of fatty and non-fatty mass to 30-40-year-old females. For this purpose, the research has included a sample of 30 females who have undergone a three months program with 3 training sessions per week. Eight anthropometric variables were applied for the processing of results and the confirmation of the difference between the initial and the final state, it has been applied the t-test for dependent groups within the SPSS statistics 21.0 program. The training program with aerobic exercises applied to this group of women shows that aerobic exercises influence positively weight reduction and passive body mass and so, it should be part of fitness exercises in order to improve the health condition.

Keywords: Physical activity, body mass, tested, t-test.

Introduction

The content, the type of exercises , the intensity and the extensity of the exercise affect health preservation and advancement, especially in the maintenance of the ideal weight, which means a ratio between fatty and non-fatty mass.

Considering that in the 21st century the emphasis is on the importance of physical activity as an essential element of people's health, who deal with these types of physical activities, even if they are for sports or recreational purposes. First of all, sports activities affect the prevention and reduction of obesity, cardiovascular and respiratory diseases as well as many other diseases that make us think and act in integrating sports activity into everyday life as a natural necessity for all people. Physical activity of the aerobic type has a strong positive effect on human health, especially in pathogenesis of metabolic syndrome (insulin resistance, type 2 diabetes, hyperlipidemia, hypertension, and overweight). There are strong arguments that physical activity increases functional capacity and quality of life (Vuori, I. 2004).

Social environments such as sports clubs, schools, workplaces, family and friends may significantly affect the level of physical sports activity. Understanding the possibility of the circle and the obstacles we face in pursuing a healthier lifestyle can provide certain necessary knowledge to improve the healthy lifestyle.

There are several reasons that cause overweight. One of them may be due to certain hormonal disorders or metabolic disorders (Holford, 1999). However, above all, overweight occurs as a result of lack of physical activity and irregular diets (Guyton and Hall, 2008). That is, if the body regularly consumes more calories than we can spend, such calories obtained from food will be converted to excess weight in the form of deposited fat.

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Most people, to avoid overweight, are subjected to exhausting diets (hunger), which in most cases is accompanied by multiple health consequences.

As a result of hunger is the loss of muscles tissue that help in the consumption of excess fat. A better way to reach the desired goal is the regular sports physical activity. With exercises, energy reserves stored as fat are spent, and loss of muscle protein is avoided (Malacko and Rađo, 2004). For this reason, energy is derived from fats in relation to carbohydrates. People who deal with aerobic physical activity increase the ability to use fat as a source of energy and reduce the risk of various diseases such as diabetes. In order to avoid excessive fat removal (Sharkey and Gaskill, 2008) suggest that two types of training, aerobic and anaerobic training should be combined. Nowadays, more and more it is being proved the fact that sporting activity is one of the main factors that affects the reduction of body weight and the improvement of the quality of life.

Aim of the study

The purpose of this study is to verify the influence of aerobic physical activities on body mass and volume and to reduce the ratio between fatty and non-fatty mass to 30-40 year-old females.

Material and methods

The population from which the sample was taken for this research is defined as the population of 30-40 year-old females who are active in fitness exercises in the Municipality of Gjilan. In this research were included 30 women who willingly underwent a three-month aerobic physical exercise program, three training sessions per week, lasting one hour. Eight anthropometric variables have been applied: body weight (BW), chest perimeter (CHP), arm perimeter (AP), under knee perimeter (fibula) (UKP), spine fatty subcutaneous tissue (SFST), arm fatty subcutaneous tissue (AFST), abdomen fatty subcutaneous tissue (AFSTT) and under knee (fibula) fatty subcutaneous tissue (UKFST). Two other variables, non-fatty body mass (NFBM) and fat body mass are determined according to the method (FBM), (Carter, 1970) and the Body Mass Index (BMI). For the elaboration of the results

and the confirmation of the difference between the initial and the final state of affairs, t-test for subgroups was applied within the SPSS statistics 21.0 program.

	Exercises	Intensity.	No.	Break
	Most 1 4		Кер.	
	vveek 1-4			
	Training 1-12			
1	Walking 1000 meters	3km/hour	1	5 min
2	Running 5 minutes	6km/hour	3	1 min
3	Riding ergometer bike 5minutes	20rr/m/25w	3	1 min
4	Stretching exercises (5 exercises)	Low	1	10 sec
	Week 5-8			
	Training 13-24			
1	Walking 2000 meters	4km/hour	1	5 min
2	Running 5 minutes	7km/hour	3	1 min
3	Riding ergometer bike 5 minutes	25rr/m/50w	3	1 min
4	Stretching exercises (5 exercises)	Low	1	10 sec
	Week 9-12			
	Training 25-36			
1	Walking 2000 meters	5km/hour	1	5 min
2	Running 5 minutes	8km/hour	3	1 min
3	Riding ergometer bike 5minutes	30rr/m/75w	3	1 min
4	Stretching exercises (5 exercises)	Low	1	10 sec

1. Aerobic kinesiology treatment program
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Results and discussion

Table 1, presents descriptive analyzes of anthropometric variables of involved people in fitness from the Municipality of Gjilan before and after the treatment with aerobic fitness exercises. The arithmetic average of anthropometric variables, the body weight before aerobic physical exercise is 69.39 kg, while after physical aerobic exercise is 65.92 kg. The arithmetic avarage of the anthropometric variable, the chest perimeter before aerobic exercise is 93.4 cm, while after aerobic physical exercise is 89.23 cm. The arithmetic average of the anthropometric variable, the arm perimeter is 26.77. cm while after aerobic physical exercise is 24.93 cm. The arithmetic avarage of the anthropometric avarage of the avarage of the anthropometric avarage of the avarage of the anthropome

subcutaneous is 26.04. mm while after aerobic physical exercise is 22.19 mm. The arithmetic avarage of anthropometric variable, arm fatty subcutaneous tissue is 25.40. mm while after aerobic physical exercise is 21.54 mm. The arithmetic avarage of anthropometric variable, the abdomen fatty subcutaneous tissue is 31.82. mm while after aerobic physical exercise is 27.97 mm. The arithmetic avarage of anthropometric variable, under knee fatty subcutaneous tissue is 25.13. mm while after aerobic physical exercise is 27.97 mm. The arithmetic variable, the active body mass is 47.64 kg. while after physical aerobic exercise is 46.18 kg. The arithmetic avarage of anthropometric variable, the passive body mass is 21.75 kg, while after aerobic physical exercise is 26.67, while after aerobic exercise physical exercise is 24.23.

Before treatment				After treatment			
	N	Mean	Std. DeV.	Ν	Mean	Std. DeV.	
BW	30	69.3933	6.28353	30	65.9200	6.35710	
СНР	30	93.2467	4.83940	30	89.2333	5.00299	
AP	30	26.7700	2.51316	30	24.9367	2.44843	
UKP	30	34.0700	3.00082	30	32.2167	3.50655	
SFST	30	26.0467	4.83013	30	22.1933	4.84007	
AFST	30	25.4033	3.74999	30	21.5467	3.79789	
AFSTT	30	31.8200	6.06848	30	27.9767	6.14305	
UKFST	30	25.1300	5.03102	30	22.7467	5.17359	
NFBM	30	47.6427	3.98973	30	46.1893	3.99467	
FBM	30	21.7507	2.65723	30	19.8043	2.65200	
ВМІ	30	26.6763	1.90536	30	24.2353	2.08532	

Table 1. Basic statistical parameters before and after treatment - With aerobic physical activities

Table 2, shows the values of differences between arithmetic averages in anthropometric variables to involved people in the fitness program. The arithmetic avarage of anthropometric variables has a difference in arithmetic avarage before and after aerobic exercise MD = 3.47, t = 46.57, DF = 29, Sig = .000 and shows that a significant difference was obtained at p <0.000. The arithmetic avarage of the anthropometric variable, the perimeter of the chest has a difference in arithmetic avarage before and after aerobic

exercise MD = 4.01, t = 61.15, DF = 29, Sig = .000 which shows that a significant difference was obtained at p < 0.000. The arithmetic avarage of the anthropometric variable arm perimeter has a difference in arithmetic avarage before and after aerobic exercise MD = 1.83, t = 31.39, DF = 29, Sig = .000 which shows that a significant difference was obtained at p <0.000. The arithmetic avarage of the anthropometric variable of the under knee perimeter has a difference in the arithmetic avarage before and after aerobic exercise MD = 1.85, t = 5.32, DF = 29, Sig = .000 which shows that a significant difference was obtained at p < 0000. The arithmetic avarage of the anthropometric variable of the fatty tissue of the spine compared to the arithmetic average before and after aerobic exercise MD = 3.85, t = 61.15, DF = 29, Sig = .000 which shows that a significant difference was obtained at p < 0.000. The arithmetic avarage of the anthropometric variable of the arm muscle differs in the arithmetic average before and after the aerobic exercise for MD = 3.85, t = 69.31, DF = 29, Sig = .000 which shows that a significant difference is obtained at p level <0.000. The arithmetic avarage of the anthropometric variable of the abdominal fatty tissue differs in the arithmetic average before and after the aerobic exercise MD = 3.84, t = 68.56, DF = 29, Sig = .000 which shows that a significant difference is obtained at p < 0000. The arithmetic avarage of the anthropometric variable of the under knee fatty tissue differs in the arithmetic average before and after the aerobic exercise for MD = 2.38, t = 28.60, DF = 29, Sig = .000 which shows that a significant difference is obtained at the level p < 0.000. The arithmetic avarage of the anthropometric variables of the active body mass has a difference in arithmetic avarage before and after aerobic exercise MD = 1.45, t = 144.61, DF = 29, Sig = .000 which shows that a significant difference was obtained at p < 0.000 . The arithmetic avarage of anthropometric variables of passive body mass has a difference in arithmetic average before and after aerobic exercise MD = 1.94, t = 193.41, DF = 29, Sig = .000 which shows that a significant difference was obtained at p < 0.000. The arithmetic avarage of the anthropometric variables shows the difference in arithmetic avarage before and after aerobic exercise for MD = 2.44, t = 5.60, DF = 29, Sig = .000 which shows that a significant difference is obtained at p level <0.000.

The obtained results show that aerobic exercises applied three times a week over the three-month period have had a positive effect on reducing the body mass on the fatty tissue under the skin. The results are consistent with several authors' researches that emphasize how body weight and percentage of some other components of body weight, especially fatty mass, vary depending on the impact of particular physical activity (Report of the Task Group on Reference Man, 1975).

It has already been emphasized the fact that the percentage of body fat on different people depends on the type of physical activity. The increased values in body fat affect negatively the athlete's physical skills of different sports in the mechanical, metabolic and thermoregulatory characteristics, so aerobic exercises have a greater impact on the reduction of body mass, especially of that fatty mass (Behnke et al. 1995).

	Paired Differences					Sig.
	Mean	Std. Dev.	Std. Error Mean	t	df	(2-tailed)
BW – BW	3.47333	.40847	.07458	46.574	29	.000
CHP – CHP	4.01333	.35886	.06552	61.255	29	.000
AP – AP	1.83333	.31984	.05839	31.395	29	.000
UKP – UKP	1.85333	1.90476	.34776	5.329	29	.000
SFST – SFST	3.85333	.34515	.06301	61.150	29	.000
AFST – AFST	3.85667	.30477	.05564	69.311	29	.000
AFSTT – AFSTT	3.84333	.30703	.05605	68.564	29	.000
UKFST – UKFST	2.38333	.45644	.08333	28.600	29	.000
NFBM – NFBM	1.45333	.05504	.01005	144.615	29	.000
FBM – FBM	1.94633	.05512	.01006	193.418	29	.000
BMI – BMI	2.44100	2.38458	.43536	5.607	29	.000

 Table 2. Differences in basic statistical parameters before and after treatment with aerobic physical activities

Conclusion

The obtained changes after treating kineziologic type of aerobic for three months show that aerobic physical activities organized in the right way in the morphological space affect the body components within which the favorable relations between the muscle mass and the subcutaneous fatty mass and the prevention obesity and its reduction in most sports is a deterrent factor in achieving success, while in the case of ordinary people, presents the greatest risk in the occurrence of various diseases, especially the cardiovascular system. Physiological effects are oriented to stimulate the functioning of the cardiovascular and respiratory system and so on.

The training program with aerobic exercises applied to this group of women, shows that aerobic exercises, positively influence weight reduction and passive body mass and so should be part of fitness exercises in order to improve the health condition. The body fat mass is in a fair ratio with the physical activities that have a longer duration, i.e., the fatty mass is affected by aerobic endurance exercises.

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