HEALTH ORIENTED TRAINING FOR WOMEN IN SELECTED FITNESS CLUBS

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Annotation. *Purpose:* Low physical activity level has negative effect on human physical and mental life. The purpose of the study was to compare the health oriented effects of aerobic and strength training in selected fitness clubs for women. *Material:* Sixty women aged 24 to 37 (mean 29,3 ± 3,6) from three clubs in Wroclaw: Fitness Planet, Fitness Barbara and Redeco took part in this study, 30 women participated in aerobic and 30 in strength training. Training programme was realised twice a week for 60 minutes over 3 months. Most of the participants had higher education and a sedentary job. *Results:* Study results revealed a significant decrease of body weight, circumference, body fat and BMI. Greater reduction of mean values of the measured parameters was observed in subjects participating in aerobic workouts. *Conclusions:* Training programmes in a fitness clubs, led to a significant reduction in body weight, circumferences, body fat and BMI. Greater reduction of mean values of the measured parameters was observed in subjects participating in aerobic workouts.
Key words: women, fitness clubs, physical activity, BMI index.

Introduction[1]

During past few years the interested in healthy life style increased. The society is more aware of the importance of physical activity in everyone's life. Commencement of physical activity entails many positive changes. Among them visual, psychological and health changes should be mentioned [3, 4]. This knowledge and greater access into fitness clubs caused that being "fit" meaning healthy and in good shape became popular [1, 7]. Physical activity is beneficial for the organism, increases cardiovascular endurance, strengthens the muscles and prolongs youth. It also helps to prevent and eliminate health problems [6, 9]. Important are the breathing exercises that according Krejci improve muscle relaxation, correct breathing rhythm and decrease psychophysical tension [7, 8]. Fitness became a lifestyle, expression of health care. Proper, systematic health oriented workout is the first step into healthy life [1, 3, 8].

Aim of the study.

The aim of the present study was to compare the health oriented effects of aerobic and strength training programme in selected fitness clubs for women.

Material and methods. 60 women aged 24 to 37 (mean 29,3 ± 3,6) from three clubs in Wrocław: Fitness Planet, Fitness Barbara and Redeco took part in this study. 30 women participated in aerobic and 30 in strength training. Training programme was realised twice a week for 60 minutes over 3 months.

Methods The evaluation was conducted three times over 3 months: preliminary evaluation, after 2 months and final evaluation. Following procedures were used: questionnaire: initials, age, education, character of work, training type: west and hip circumference measurement – with tape measure accurate to 1 cm; BMI index, body weight [kg] divided by body height in [cm], raised to square; body composition (BIA). The bioelectrical impedance is based on different conductivity of bones, viscera and adipose tissue. Body composition was calculated with appropriate algorithm [10, 15]; heart rate measurements during training session (before training, during intensity peak, immediately after training and 15 minutes afterwards) [2, 11-14]. All measurements were conducted in similar conditions.

Study results were analysed with statistical methods.

Basic statistics were used: mean values and standard deviations were calculated, differences of measured parameters were assessed with the t-test for independent samples.

Results: Group characteristics

Half of the study group (n=30) participated in aerobic and half (n=30) in strength training in selected fitness clubs. Subjects participating in strength training were 2,3 years older in average. The most of them had higher education (63%), (33%) – secondary education (4%) basic or vocational education. Most of the subjects (62%) had sedentary job and 2 did not work at all.

Somatic parameters analysis. Subjects participating in strength had greater body height, weight, waist/hip circumference in average (tab. 1). The BMI index was not statistically different. Observed differences were not statistically significant, only body height was.

Table1.

Somatic parameters comparison in subjects participating in aerobic and strength training (preliminary measurement)

Parameter	Aerobic training		Strength training		t-tes	
	$\bar{x}$	sd	$\bar{x}$	sd	t	p
body height	165,9	5,9	169,1	5,3	2,22	0,03
body weight	64,7	10,0	67,3	7,9	1,13	0,26
BMI	23,48	3,31	23,53	2,51	0,07	0,95
adipose tissue	29,34	6,06	29,88	6,04	0,34	0,73

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waist circumference	78,8	8,5	80,1	7,9	0,61	0,54
hip circumference	96,8	6,3	99,1	6,6	1,65	0,11

Somatic parameters changes analysis in training period

Measurements were conducted 4 times: - preliminary, first control I, second control II, final. Body weight decreased systematically over the whole period. Body weight changes were similar in both groups. Greater variety of body weight changes was observed in subjects practising aerobic training. With body weight decrease also waist and hip circumference decreased (tab.2). Circumference changes were similar in both groups.

Table 2.

Waist and hip circumference changes over analysed period

circumference	measurement	Aerobic training		Strength straining	
		$\bar{x}$	sd	$\bar{x}$	sd
waist (cm)	preliminary	78,8	8,5	80,1	7,9
	first control	77,1	8,0	78,7	7,6
	second control	75,0	7,6	76,7	7,3
	final	73,1	7,3	74,7	7,0
hip (cm)	preliminary	96,8	6,3	99,1	6,6
	first control	95,3	6,2	97,9	6,5
	second control	93,2	5,1	95,5	6,1
	final	91,3	4,8	93,5	5,7

Together with BMI changes percentage of adipose tissue changed as well. The rate of adipose tissue decrease was independent of training type (tab.3). Despite similar course of mean values changes the total value change was different depending on the training type but statistically insignificant.

Table 3.

BMI and adipose tissue (%) change over training period depending on training type

parameter	measurement	Aerobic training		Strength training	
		$\bar{x}$	sd	$\bar{x}$	SD
BMI (kg/m^2)	preliminary	23,5	3,3	23,5	2,5
	first control	23,1	3,1	23,1	2,4
	second control	22,3	2,9	22,5	2,3
	final	21,6	2,8	21,8	2,3
adipose tissue (%)	preliminary	29,3	6,1	29,9	6,0
	first control	28,6	6,0	28,9	5,7
	second control	27,0	5,6	27,3	5,4
	final	25,0	5,1	25,7	5,2

The greater decrease of mean body mass and mean waist circumference was observed in subjects participating in aerobic training: difference of mean body mass between two analysed groups was 0,4kg and difference of mean waist circumference was 0,3cm. Mean hip circumference decrease was 5,5 cm independent on training type. Great dispersion of body mass and circumferences decrease must be pointed out - from12 kg up to less than 1 kg of body mass, from 14 cm to 0 cm of waist circumference and from 16cm to 1cm of hip circumference. This great variety could cause lack of statistical significance of the observed changes (tab. 4). Mean adipose tissue decrease, expressed also as BMI change, was greater in subjects practising strength training. Mean value difference between both groups was very little (BMI - 0,2 kg/m^2, 0,1% adipose tissue). Body mass, circumferences and percentage of adipose tissue decrease were clear to observe, but their correlation with the training type can't be proven based study results.

Table 4.

Overall decrease of measured parameters values in both groups

parameter	Training type	mean	min	max	t	P
body weight (kg)	aerobic	5,3	11,8	1,0	0,59	0,56
	strength	4,9	9,0	0,9		
waist circumference (cm)	aerobic	5,7	14,0	2,0	0,44	0,66
	strength	5,4	9,0	0,0		
hip circumference (cm)	aerobic	5,5	16,0	5,0	0,00	1,00
	strength	5,5	13,0	1,0		
BMI (kg/m^2)	aerobic	1,9	4,6	0,4	0,50	0,62
	strength	1,7	3,1	0,3		
adipose tissue (%)	aerobic	4,3	2,4	1,0	0,95	0,35
	strength	4,2	2,3	1,8		

Heart rate changes during training

During first training phase HR (heart rate) increased up to maximal value (2. measurement), afterwards a linear decrease was observed until 15 minutes post training. The character of changes didn't differ over the whole studied period, therefore HR analysis was conducted based on measurements taken during preliminary, first control, second control and final evaluation. Mean Hrmax in aerobic group was 155-159 bpm. In the group practising strength training mean HR max was 120- 130 bpm. HR increase at the beginning and later decrease was different in both groups. Mean HR increase (between resting value and maximal value) was greater in subjects participating in aerobic training programme. The course of HR decrease from intensity peak till the end of the training session was similar in both training groups, but during first 15 minutes of recovery it decreased faster in aerobic group (tab.5). Differences between both groups during recovery were statistically significant. HR deficit (difference between resting value and recovery value) was also significantly greater in subjects practising aerobic training. Which means that after aerobic training the recovery must be longer in order to achieve resting HR values.

Table 5.

Mean HR values comparison in both training groups[*)]. Negative values indicate decrease

Training period	Aerobic training		Strength training		t-test	
	mean	sd	mean	sd	t	P
T_0 - T_1	82,0	13,1	59,4	6,0	8,62	<0,0001
T_1 - T_2	-32,3	9,3	-29,8	7,8	1,13	0,2615
T_2 - T_3	-33,1	12,4	-20,6	7,7	4,71	<0,0001
T_0 - T_3	16,5	9,7	9,0	7,5	3,37	0,0014

Discussion Over the last few years the interest in healthy life style has increased. The societies are more and more aware of physical activity value in everyday life. Regular physical activity causes many positive changes including decreased risk of cardiovascular disease, obesity and diabetes [1,2,8,14]. Times when only man were to find in sport centres are gone. Nowadays women became advocate of strength exercises and they choose them as often as different types of fitness programmes [4,9]. For most women „shapely silhouette" is the most important factor and motivation to start physical activity. In her study it was important for 69% subjects, "health issues" were very important for 31 % [2,4,5]. In the present study health issues were very important for 42% and for 58% important. The third motivating factor was the fight against obesity. Losing weight was very important for 34% participants and important for 17%. Interestingly for 49% it wasn't important at all. Achieving high motor ability levels and stress management were less motivating factors. Considering age, mid age and elderly women exercised aminy to improve health, maintain physical fitness and good wellbeing, younger mainly wanted to lose weight. Study results have shown that body mass and circumferences decreased progressively over the whole training programme. Body mass and waist circumference mean decrease was greater in subjects participating in aerobic training: difference of mean body mass between two analysed groups was 0,4kg and difference of mean waist circumference was 0,3cm. Mean hip circumference decrease was 5,5 cm independent on training type. Great dispersion of body mass and circumferences decrease must be pointed

out - from12 kg up to less than 1 kg of body mass, from 14 cm to 0 cm of waist circumference and from 16cm to 1cm of hip circumference. This great variety could cause lack of statistical significance of the observed changes.

Overweight and obesity became one of the biggest health risk factors in modern societies [2,5,9]. They are also one of bad controlled cardiovascular disease risk factors. Efficiency of programmes reducing overweight is determined by many factors, one of them is the readiness to undertake effort in order to reduce body mass. Current guidelines in obesity management include change of life style, eating habits and increasing physical activity. The role of psychological help is also underlined. According to those guidelines, pharmacological treatment is implemented in subjects with BMI >30 kg/m^2 or in subjects with BMI >27 kg/m^2 with associated risk factors such as: type II diabetes, dyslipidaemia or cardiovascular disease. For surgical treatment qualified can only be subjects with BMI >40 or >35 with high associated risk and after trial of conservative treatment including diet and pharmacological treatment, who are ware of risk associated with surgery. Optimal weight loosing rate is about 0,5–1 kg/week. Long-term changes and not fast effects should be pointed out. Life style modification including reducing diet, regular physical activity can lead into great weight loose and improvement of most biochemical parameters of atherosclerosis. Obesity must be seen as chronic disease, requiring continuous treatment and support to individuals willing to lose weight and maintain their new status [5,3,8,9]. In present study results adipose tissue decrease was expressed as BMI change, that was slightly greater in subjects practising strength training. Differences between both groups were very small: BMI difference was 0,2kg/m^2, percentage of adipose tissue difference was 0,1%. Body mass and circumferences reduction as a result of participating in training programmes in fitness clubs was distinct, but correlation between those and training type couldn't be proven. Among all environmental obesity factors two are key factors – availability of highly processed, cheap food high in fat and simple carbohydrates (fast food) and limitation of daily physical activity. Only every tenth Pole undertakes physical activity on a regular basis 2-3 times a week, which allocates Poland at the end of European countries [2]. In the last few years monitoring of cardiovascular function became an argument for the aerobic exercises concept [14]. VO2max calculated in ml / kg / min was used as an indicator of ability to absorb oxygen at the cellular level. Correlation between training intensity and resting and exercise HR values allowed calculating a personal VO2max value [8,10,15].

From physiological point of view in order to achieve a desired training goal – aerobic capacity increase – training intensity for women should be at the level of HR=130-160 bpm in aerobic and HR=120-135 bpm in strength training. It is believed, that minimal training intensity necessary to causal adaptive changes in cardiovascular and respiratory should be between 55 and 65%HRmax. The only criterion is that women participating in aerobic training programme must be adult and healthy. Increasing training intensity up to 70-85%HRmax cause physical fitness improvement, above 85%HRmax energy is produced in anaerobic metabolism. Aerobic training in present study lasted 60 minutes and HRmax was 155-159 bpm. In strength training HRmax was 120- 130 bpm. Mean HR increase from resting values to HRmax was greater in subjects participating in aerobic training. HR decrease from peak intensity phase till the end of single training session was similar in both groups. Faster HR decrease during recovery was observed in aerobic group. Differences of initial HR increase and subsequent decrease between groups were statistically significant. HR deficit (difference between resting value and recovery value) was significantly greater in subjects practising aerobic training. Which means that after aerobic workout the recovery must be longer in order to achieve resting HR values [5,8,2,3,10].

Conclusions

1. The workouts in fitness clubs involved mainly women with higher education or secondary education. The level of education had no impact on the choice of the type of training.
2. Most of the women performed a sedentary job.
3. Training programmes in a fitness clubs, led to a significant reduction in body weight, circumferences, body fat and BMI. Greater reduction of mean values of the measured parameters was observed in subjects participating in aerobic workouts.
4. Aerobic training caused significantly greater HR changes than strength training. However, it required a longer recovery.
5. Mainly women with massive physique participated in strength training programme.

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