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EFFECT OF DIFFERENT FITNESS PROGRAMS ON THE MORPHOLOGICAL PARAMETERS OF WOMEN AGED 30–40 YEARS

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Aim. The article deals with establishing the features of changes in the morphological parameters of women aged 30–40 years involved in different fitness programs at the basic stage. **Materials and methods.** 85 women aged 30–40 years participated in different fitness programs during 9 weeks: 17 – gym, 19 – traditional aerobics, 17 – strength aerobics, 17 – functional training, 15 – fitness-yoga. 60-minute fitness lessons were conducted 3 times per week. We measured the following parameters: height, weight, body circumference, skin-fat fold volume, the absolute and relative values of the muscle and fat tissues. **Results.** In women, body mass reduces under the effect of gym training, traditional aerobics, and functional training. The reduction of body circumference measurements occurs under the effect of gym training, traditional aerobics, strength aerobics, and functional training. Muscle mass increases as a result of gym training and decreases after traditional aerobics. The absolute and relative mass of the fat tissue reduces under the effect of gym training, traditional aerobics, and functional training. **Conclusion.** Different fitness programs influence differently morphological status in women aged 30-40 years.

Keywords*: women, average age, fitness programs, morphological parameters.*

Introduction. The age period of 30–40 years is especially important for women as it is critical for reproductive health, physiological activity, and the functional status of the body in general [5, 7]. Women of this age actively perform social, family, educational, organizational, and management roles [6]. In modern society, the lifestyle of middle-aged women is characterized by insufficient physical activity with low temp and movement volume [8]. Sedentary lifestyle results in excess weight and obesity, leading to the reduction of overall working efficiency and endurance, as well as to the cardiovascular, musculoskeletal, and metabolic disorders [12]. Such disorders require regular physical activity [14].

Modern fitness clubs offer a wide range of fitness programs to satisfy women's needs in physical activity [2, 3, 9, 11, 13, 15]. However, focused fitness programs cannot provide an overall effect on the morphological parameters of middle-aged women and satisfy their needs in weight reduction and body correction. This leads to the necessity of their targeted integration [4, 10].

Solving this problem requires objective information about the effect of different fitness programs on the morphological status of people.

Aim. The article deals with establishing the features of changes in the morphological parameters of women aged 30–40 years involved in different fitness programs at the basic stage.

Materials and methods. 85 middle-aged women with excess weight and I or II grade obesity participated in the study. All women were divided into 5 groups depending on their fitness program: 17 – gym, 19 – traditional aerobics, 17 – strength aerobics, 17 – functional training, 15 – fitness-yoga. 60-minute fitness lessons were conducted three times per week. The exercise experience of women was no more than two months. Anthropometric data were obtained according to a standard protocol [1]. At the beginning of the training course, we measured height, weight, body circumference, skin-fat fold volume, the absolute and relative values of the muscle and fat tissues. The second measurement was conducted in 2 months.

Results. The study allowed us to reveal a different effect of 9-week fitness programs on the morphological parameters of middle-aged women (Table).

In particular, in women attending gym, we registered the following changes in the parameters studied:

– body mass reduced from 68.0 ± 1.16 to 64.5 ± 1.12 kg ($t = 2.17$; $p < 0.05$);

– body circumference decreased both in

Table

Changes in the morphological status of middle-aged women under the effect of different fitness programs

Fitness programs	Morphological parameters						
	Body mass	Body circum-ference	Skin-fat fold volume	Muscle mass		Fat mass	
				Absolute	% of body weight	Absolute	% of body weight
Gym (n = 17)	▼	▼	▼	▲	▲	▼	▼
Traditional aerobics (n = 19)	▼	▼	▼	▼	●	▼	▼
Aerobics (strength) (n = 17)	●	▼	▼●	●	●	▼	▼
Functional training (n = 17)	▼	▼	▼	●	●	▼	▼
Yoga (n = 15)	●	●	●	●	●	●	●

Note: ▲ – increase; ▼ – decrease; ● – unchanged.

general and in certain areas: in general (from 149.0 ± 0.85 to 145.8 ± 0.86 cm, t = 2.66, p < 0.01); pelvic circumference (from 99.9 ± 0.58 to 97.6 ± 0.58 cm, t = 2.80, p < 0.01); maximal lower arm circumference (from 24.4 ± 0.10 to 23.9 ± 0.09 cm, t = 3.55, p < 0.001); calf circumference (from 36.4 ± 0.26 to 35.6 ± 0.27 cm, t = 2.12, p < 0.05); hip circumference (from 58.6 ± ± 0.39 to 57.4 ± 0.40 cm, t = 2.15, p < 0.05); shoulder circumference in the relaxed state (from 29.5 ± 0.22 to 28.8 ± 0.21 cm, t = 2.27, p < 0.05); waist circumference (from 77.5 ± 0.73 to 74.1 ± ± 0.64 cm, t = 3.51, p < 0.001);

– absolute muscle mass increased from 26.43 ± 0.33 to 27.45 ± 0.35 kg (t = 2.13; p < 0.05), while the percentage of muscle mass in body composition increased from 39 % to 43 % (t = 7.38; p < 0.001);

– absolute fat mass decreased from 21.03 ± ± 0.48 to 16.07 ± 0.37 kg (t = 8.23; p < 0.001), while the percentage of fat mass in body composition decreased from 30.7 ± 0.48 to 24.7 ± 0.36 % (t = 10.03; p < 0.001);

– skin-fat fold volume decreased both in general and in certain areas: in general (76.9 ± ± 1.23 to 59.1 ± 1.04 mm, t = 11.08; p < 0.001); the frontal part of the shoulder (from 10.7 ± 0.19 to 7.62 ± 0.20 mm, t = 11.26, p < 0.001); the back part of the shoulder (from 18.26 ± 0.45 to 14.26 ± 0.31 mm, t = 7.26, p < 0.001); lower arm (from 11.24 ± 0.19 to 7.76 ± 0.17 mm, t = 13.70, p < 0.001); abdomen (from 16.68 ± 0.36 to 14.12 ± ± 0.30 mm, t = 5.45, p < 0.001); under the shoulder blade (from 17.41 ± 0.63 to 14.35 ± 0.49 mm, t = 3.83, p < 0.001); the frontal part of the hip (from 29.53 ± 0.64 to 24.00 ± 0.57 mm, t = 6.44, p < 0.001); calf (from 21.71 ± 0.42 to 16.41 ± ± 0.34 mm, t = 9.83, p < 0.001).

In women attending traditional aerobics, we registered the following features of changes in the parameters of the morphological status:

– body mass reduced from 72.18 ± 2.21 to 66.21 ± 1.95 kg, t = 2.21, p < 0.05;

– body circumference decreased both in general and in certain areas: in general (from 155.39 ± ± 1.94 to 144.82 ± 1.98 cm, t = 3.81, p < 0.001); pelvic circumference (from 103.53 ± 1.42 to 98.34 ± 1.31 cm, t = 2.68, p < 0.001); hip circumference (from 61.53 ± 0.85 to 57.6 ± 0.90 cm, t = 3.18, p < 0.05); shoulder circumference in the relaxed state (from 31.18 ± 0.70 to 28.58 ± 0.62 cm, t = 2.79, p < 0.05); maximal lower arm circumference (from 25.53 ± 0.26 to 23.95 ± 0.25 cm, t = 4.42, p < 0.05); calf circumference (from 37.16 ± 0.55 to 34.71 ± 0.59 cm, t = 3.03, p < 0.05); waist circumference (from 79.79 ± 1.66 to 74.47 ± 1.40 cm, t = 2.44, p < 0.01);

– absolute muscle mass decreased from 28.80 ± 0.79 to 25.89 ± 0.74 kg (t = 2.70, p < 0.05) against the unchanged muscle mass in body weight composition;

– absolute fat mass decreased from 24.12 ± ± 1.19 to 18.55 ± 0.98 kg (t = 3.61; p < 0.001), while the percentage of fat mass in body weight composition decreased from 38.2 ± 1.00 to 27.8 ± ± 0.96 % (t = 3.89, p < 0.001);

– skin-fat fold volume decreased both in general and in certain areas: in general (from 82.6 ± ± 3.32 to 70.4 ± 3.22 mm, $t = 2.65$, $p < 0.05$); the frontal part of the shoulder (from 10.95 ± 0.65 to 9.16 ± 0.51 mm, $t = 2.17$, $p < 0.05$); the back part of the shoulder (from 21.26 ± 1.30 to 17.53 ± ± 1.24 mm, $t = 2.09$, $p < 0.05$); lower arm (from 11.16 ± 2.29 to 9.53 ± 2.37 mm, $t = 2.16$, $p < 0.05$); abdomen (from 20.53 ± 4.06 to 15.05 ± 2.97 mm, $t = 4.74$, $p < 0.001$); under the shoulder blade (from 20.79 ± 6.58 to 14.05 ± 3.91 mm, $t = 3.84$, $p < 0.001$); the frontal part of the hip (from 35.16 ± ± 1.43 to 30.50 ± 1.44 mm, $t = 2.29$, $p < 0.05$); calf (from 20.24 ± 1.04 to 17.05 ± 1.09 mm, $t = 2.12$, $p < 0.05$).

In women involved in strength aerobics, we registered the following features:

– body mass did not change statistically significant ($t = 1.97$, $p > 0.05$);

– body circumference decreased both in general and in certain areas: in general (from 161.5 ± ± 2.37 to 152.3 ± 2.37 cm, $t = 2.73$, $p < 0.05$); pelvic circumference (from 105.5 ± 1.56 to 100.8 ± ± 1.58 cm, $t = 2.13$, $p < 0.05$); hip circumference (from 61.6 ± 1.1 to 58.4 ± 1.03 cm, $t = 2.14$, $p < 0.05$); shoulder circumference in the relaxed state (from 33.4 ± 0.79 to 31.1 ± 0.72 cm, $t = 2.21$, $p < 0.05$); maximal lower arm circumference (from 26.9 ± 0.37 to 25.7 ± 0.37 cm, $t = 2.19$, $p < 0.05$); calf circumference (from 39.6 ± 0.8 to 37.1 ± 0.8 cm, $t = 2.18$, $p < 0.05$); waist circumference (from 81.4 ± 1.88 to 75.9 ± 1.76 cm, $t = 2.12$, $p < 0.05$);

– there were no statistically significant changes in absolute muscle mass and the percentage of muscle mass in body weight composition ($t = 0.03$, $p > 0.05$);

– absolute fat mass decreased from 28.65 ± ± 2.03 to 22.10 ± 1.66 kg ($t = 2.50$, $p < 0.05$), while the percentage of fat mass in body weight composition decreased from 39 ± 2.51 % to 32 ± ± 2.4 % ($t = 2.14$, $p < 0.05$);

– skin-fat fold volume decreased both in general and in certain areas: in general (from 92.7 ± ± 4.72 to 76.7 ± 4.66 mm, $t = 2.41$, $p < 0.05$); the frontal part of the shoulder (from 15.3 ± 0.85 to 12.7 ± 0.78 mm, $t = 2.22$, $p < 0.05$); the back part of the shoulder (from 23.9 ± 1.83 to 18.8 ± ± 1.63 mm, $t = 2.11$, $p < 0.05$); lower arm (from 12.8 ± 0.60 to 10.9 ± 0.60 mm, $t = 2.25$, $p < 0.05$); the frontal part of the hip (from 36.8 ± 1.92 to 30.8 ± 1.90 mm, $t = 2.22$, $p < 0.05$); calf (from 23.5 ± 1.33 to 19.3 ± 1.38 mm, $t = 2.20$, $p < 0.05$). There were no statistically significant changes in the skin-fat fold volume of the abdomen and under the shoulder blade.

In women involved in functional training, we registered the following features:

– body mass reduced from 70.71 ± 1.52 to 66.06 ± 1.59 kg ($t = 2.12$; $p < 0.05$);

– body circumference decreased both in general and in certain areas: in general (from 156 ± ± 1.78 to 149 ± 1.74 cm, $t = 2.80$, $p < 0.05$); pelvic circumference (from 104 ± 1.53 to 99.1 ± 1.35 cm, $t = 2.39$, $p < 0.05$); hip circumference (from 62.1 ± ± 0.83 to 59.5 ± 0.75 cm, $t = 2.3$, $p < 0.05$); shoulder circumference in the relaxed state (from 31.2 ± ± 0.67 to 29.1 ± 0.71 cm, $t = 2.12$, $p < 0.05$); maximal lower arm circumference (from 25.3 ± ± 0.32 to 24.2 ± 0.32 cm, $t = 2.35$, $p < 0.05$); calf circumference (from 37.2 ± 0.41 to 35.9 ± 0.4 cm, $t = 2.19$, $p < 0.05$); waist circumference (from 81 ± ± 1.52 to 75.9 ± 2.65 cm, $t = 2.65$, $p < 0.05$);

– there were no statistically significant changes in absolute muscle mass and the percentage of muscle mass in body weight composition ($t = 1.36$; $p > 0.05$);

– absolute fat mass decreased from 25.5 ± ± 1.14 to 20.1 ± 0.94 kg ($t = 3.68$, $p < 0.001$), while the percentage of fat mass in body weight composition decreased from 36.0 ± 1.31 to 30.4 ± ± 1.37 % ($t = 2.94$, $p < 0.01$);

– skin-fat fold volume decreased both in general and in certain areas: in general (from 85.2 ± ± 3.50 to 70.4 ± 3.38 mm, $t = 3.05$, $p < 0.001$); the frontal part of the shoulder (from 11.3 ± 0.71 to 9.0 ± 0.54 mm, $t = 2.53$, $p < 0.05$); the back part of the shoulder (from 22.4 ± 1.20 to 18.1 ± ± 1.16 mm, $t = 2.58$, $p < 0.05$); lower arm (from 11. 4 ± 0.62 to 9.1 ± 0.44 mm, $t = 2.94$, $p < 0.01$); abdomen (from 19.8 ± 0.7 to 15.6 ± 0.6 mm, $t = 4.62$, $p < 0.001$); under the shoulder blade (from 22.2 ± 1.38 to 18.3 ± 1.18 mm, $t = 2.17$, $p < 0.05$); the frontal part of the hip (from 35.3 ± 1.57 to 29.7 ± 1.55 mm, $t = 2.55$, $p < 0.05$); calf (from 21.71 ± 1.02 to 18 ± 1.17 mm, $t = 2.38$, $p < 0.05$).

The analysis of the dynamics of the morphological status in women practicing fitness yoga revealed that such a training course did not influence their morphological parameters significantly.

Conclusion. The results of the study allowed us to conclude the following:

1. Body mass in middle-aged women decreases significantly as a result of gym exercises, traditional aerobics, and functional training.

2. Body circumference values in middle-aged women decrease significantly under the ef-

fect of gym exercises, traditional aerobics, strength aerobics, and functional training.

3. Skin-fat fold volume decreases significantly as a result of gym exercises, traditional aerobics, and functional training, while strength aerobics affects only specific problem areas.

4. Muscle mass both in absolute and relative values increases significantly under the effect of gym exercises, while traditional aerobics contributes to the decrease of muscle mass in the absolute values.

5. Fat mass both in absolute and relative values decreases significantly under the effect of gym exercises, traditional aerobics, strength aerobics, and functional training.

6. Solving effectively the important tasks of weight reduction, body correction, and changing the absolute values and percentage of the muscle and fat mass in body weight composition is only possible by combining different fitness programs.

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ОСОБЕННОСТИ ВЛИЯНИЯ РАЗНЫХ ПРОГРАММ ФИТНЕСА НА МОРФОЛОГИЧЕСКИЕ ПОКАЗАТЕЛИ ЖЕНЩИН 30–40 ЛЕТ

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Цель исследования. Определить особенности изменения морфологических показателей женщин 30–40 лет под воздействием тренировочных нагрузок разных программ фитнеса на базовом этапе занятий. **Материалы и методы.** Разные программы фитнеса девять недель реализовали 85 женщин 30–40 лет: 17 занимались в тренажерном зале, 19 – классической аэробикой, 17 – силовой аэробикой, 17 – функциональным тренингом, 15 – фитнес-йогой. Занятия проводились 3 раза в неделю по 60 минут. Контролировались: рост, вес, обхватные размеры звеньев тела, толщина кожно-жировых складок, рассчитывались абсолютные и относительные показатели мышечной и жировой ткани. **Результаты.** Масса тела у женщин снижается под воздействием занятий в тренажерном зале, классической аэробикой и функциональной тренировкой. Уменьшение обхватных размеров звеньев тела происходит под воздействием занятий в тренажерном зале, классической аэробикой, силовой аэробикой, функциональной тренировкой. Толщина кожно-жировых складок уменьшается под воздействием занятий в тренажерном зале, классической аэробикой, функциональной тренировкой. Увеличению мышечной массы способствуют занятия в тренажерном зале, а уменьшению – классической аэробикой. Абсолютная и относительная масса жировой ткани уменьшается при занятиях в тренажерном зале, классической аэробикой, функциональной тренировкой. **Заключение.** Тренировочные нагрузки разных программ фитнеса обладают специфическими особенностями воздействия на показатели морфологического статуса женщин 30–40 лет.

Ключевые слова: *женщины, средний возраст, программы фитнеса, морфологические показатели.*

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