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Original Article

Effectiveness of a three-month fitness training program for 40–54-year-old women

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Abstract
The development of fitness technology aimed at addressing health maintenance and improvement challenges requires evidence-based results to demonstrate their effectiveness for specific populations. **Purpose:** The aim of this study is to investigate changes in body composition in mature women after a 3-month fitness program "MyHealth". **Materials and methods:** A total of 31 women aged 40–54 participated in the "MyHealth" fitness project. The program lasted 3 months, with sessions held three times per week, each lasting 60 min. All participants underwent body composition and segment assessments using the InBody 770 body composition diagnostic system. The assessment was performed twice: 1–4 days before the program began and 1–4 days after its completion. **Results:** After the fitness program, participants exhibited a trend toward reduced weight and body mass index. Notably, there was a statistically significant increase in skeletal muscle mass by 9.6% ($p = 0.02$) and a decrease in fat tissue content by 13.4% ($p = 0.05$). The ratio of skeletal muscle mass to fat tissue mass also significantly increased by 24.0% ($p = 0.05$). Additionally, after completing the program, the participants showed a statistically significant increase in the relative protein content in the body by 8.6% ($p = 0.05$) compared to initial values. A reduction in the asymmetry between the upper and lower body was observed, with a shift in favor of the upper body relative to the lower ($p = 0.03$). A significant decrease in the absolute fat mass of both the left and right legs by 13.5% ($p = 0.05$) was also recorded. **Conclusions:** The three-month implementation of the MyHealth program in mature women resulted in a decrease in body fat, alongside an increase in relative muscle mass and protein content. These changes enhance the motivational aspect of engaging with fitness technologies. The findings support recommending the MyHealth fitness project for body shaping and weight loss in mature women.
Key Words: Fitness; Training; Physical Activity; Mature Women; Muscle Mass; Adipose Tissue

Introduction

The issue of maintaining and improving public health remains a relevant and pressing concern in many countries worldwide (Nauman et al., 2021; Kiema-Junes et al., 2024). It is widely accepted that addressing this challenge goes beyond the responsibilities of medical institutions and extends to promoting a healthy lifestyle, along with the importance of physical education and sports (Blouin et al., 2025; da Silva Rodrigues et al., 2025; Mokhtar et al., 2025; Sushchenko & Vorozheikin, 2016; Kolpakova, 2018). Evidence suggests that national strategies and programs that combine the efforts of multiple departments are the most effective (Kuzmin et al., 2016; Anderson & Ramos, 2018).

Among contemporary physical education and health approaches, various fitness programs are the most popular and accessible (Kokarev et al., 2023; Romanova et al., 2023; Rebryna et al., 2024; Kolokoltsev et al., 2021). A key advantage of these programs is their accessibility, popularity, and, consequently, their ability to foster high motivation for physical activity (Yuan et al., 2025). A wide variety of mobile applications for fitness technologies enable remote and independent use (Razaghizad et al., 2023; Alkasasbeh et al., 2024). The broad

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range of fitness disciplines available allows for tailored solutions to meet the specific needs of various population groups, including extensive options for personalizing training programs. Specialized fitness areas, such as CrossFit, stretching, aqua aerobics, and others, are also successfully developing (Savin, 2022).

When analyzing the challenges faced by various fitness disciplines, programs and technologies focused on body shaping and weight loss are particularly relevant and important (Zavaruhina et al., 2024; Mokhtar et al., 2025; Vieira et al., 2025; Romanova et al., 2022). Specialized programs are available for both men and women, tailored to factors such as age, initial physical condition, and somatic health (Osipov et al., 2017; Babagoltabar-Samakoush et al., 2025). For women, fitness programs address not only body image correction but also contribute to broader physical health improvements. Reducing the risk of cardiovascular diseases (Gaesser et al., 2022; Lee et al., 2025) and increasing physical activity (Tibana et al., 2021; Sugita et al., 2021; Blouin et al., 2025) are of particular importance. Additionally, there is a noticeable improvement in quality of life and psychoemotional well-being (Ruiz-Montero et al., 2021). An analysis of current scientific literature reveals certain shortcomings in fitness programs. Their content lacks standardization, with significant variations in implementation duration and training modes. Specifically, most of the programs studied are designed for a 6–8-month period (da Silva Rodrigues et al., 2025; Mokhtar et al., 2025). This can pose organizational and financial challenges for participants. Additionally, from a psychological perspective, the presence of early visible positive results in the short term is crucial for maintaining motivation to exercise. To address this, we performed an experimental study to evaluate the effectiveness of the " MyHealth " fitness program, which meets the abovementioned criteria of mass appeal, accessibility, reproducibility, and the availability of a "short-term" (3-month) training track. Furthermore, there is a lack of sufficient literature on the effectiveness of programs of this duration. The aim of this research is to analyze changes in body composition in mature women following the three-month "MyHealth" fitness project.

Materials and methods

The study was performed at the Higher School of Physical Education and Sports at Siberian Federal University (Siberian Federal District, Russia). Before the start of the examinations, all participants provided voluntary, signed informed consent to participate in the project. The research adhered to the ethical guidelines outlined in the Helsinki Declaration of 2008. Researchers from various universities in Russia, Kazakhstan, and Kyrgyzstan also contributed to the study.

The study included 31 women with a median age of 47 years (Me = 47).

All participants engaged in fitness training three times a week for 60 min as part of the "MyHealth" fitness project, which lasted for 3 months. Each training session followed a traditional structure consisting of three parts: the preparatory, main, and final phases. The sessions were built around functional training. The preparatory phase focused on the basic steps of classical aerobics and their variations. The main phase varied depending on the specific training day. The final phase included stretching, breathing exercises, and recovery routines.

Each weekly training session had a specific focus and unique characteristics:

- One session focused on functional training with a predominantly aerobic load, performed without rest intervals and using only body weight;
- The second session also focused on functional training but emphasized strength. Exercises were performed in a circuit format, with each circuit consisting of 8–10 exercises using body weight or light weights, repeated three times.
- The third session combined functional training with both strength and aerobic components. It began with two strength-based circuits, each consisting of eight exercises. After a short rest, an aerobic segment followed, performed without rest intervals using body weight.

All subjects underwent body composition and segmental assessments using the InBody 770 body composition diagnostic system (South Korea). The assessments were performed twice: 1–4 days before the program began and 1–4 days after its completion. The examination was performed by a single researcher in a separate, ventilated room with adequate lighting and optimal temperature conditions.

The following indicators were assessed:

- General body mass indicators and its components: weight (kg), body mass index (BMI, kg/m^2), absolute skeletal muscle mass (kg), relative skeletal muscle mass (% of body weight), absolute fat mass (kg), relative fat mass (% of body weight), and the ratio of absolute skeletal muscle mass to absolute fat mass (SM/AF), where SM represents skeletal muscle mass and AF refers to fat tissue.
- Body composition analysis: total body water (l), relative body water (% of body weight), total body protein content (kg), relative body protein content (% of body weight), total body mineral content (kg), and relative body mineral content (% of body weight).
- Lean mass analysis by segments (lean body mass is the sum of total fluid, total protein, and non-bone minerals): absolute lean mass values for the left and right upper limbs, lower limbs, and torso (kg); relative lean

mass values for the left and right upper limbs, lower limbs, and torso (% of the expected value). The expected value corresponds to the average for the relevant age and sex group, considered the norm, and is stored in the InBody 770 hardware complex database. Analysis includes the difference in lean mass between the left and right upper and lower limbs, limb balance (distribution of subjects based on the predominance of the left or right limb, or a balanced distribution), and the difference in lean mass between the upper and lower body.

- Analysis of fat tissue mass by segments: absolute fat tissue mass values for the left and right upper and lower limbs, and torso (kg); relative fat tissue mass values for the left and right limbs and torso (% of the expected value). The expected value corresponds to the average for the relevant age and gender group, considered the norm, and stored in the InBody 770 hardware complex database.
- calculated indicators: waist–hip index; visceral fat level (cm^2).
- fat-free mass (kg); basal (resting) metabolic rate (kcal).

Nonparametric statistical methods were applied. The Me was calculated for each age group. The Shapiro–Wilk test was used to assess the normality of the sample distribution. The significance of differences between the threshold values of the indicators was evaluated using the Wilcoxon test (W-criterion). A significance level of $p \leq 0.05$ was considered the minimum threshold for reliability.

Results

We evaluated the effectiveness of the tested technology in women. Figure 1 shows the study results on body weight and its components before and after the fitness program. A trend toward decreased body weight and BMI was observed, along with an increase in absolute skeletal muscle mass. The percentage of skeletal muscle mass increased significantly by 2.3% ($p = 0.02$), while the adipose tissue content in the subjects' bodies decreased by 14.9% ($p = 0.05$). The ratio of skeletal muscle mass to adipose tissue mass increased significantly by 19.9% ($p = 0.05$). The tables presented show calculations for a sample of women aged 40–54 years, with an Me of 47 years.

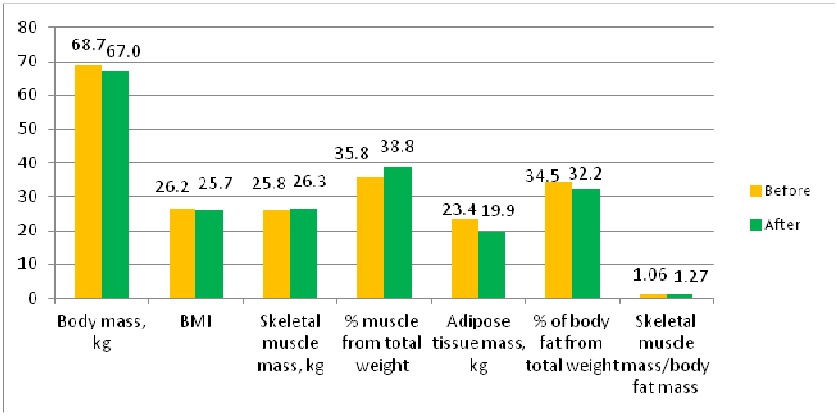

Fig. 1. Changes in body weight and its components in women before and after the fitness program

Female subjects demonstrated a statistically significant increase of 3.3% in the percentage of protein in the body after the program, compared to the initial values ($p = 0.05$), as shown in Figure 2. The total amount of water and minerals in the subjects' bodies did not change significantly during the observation period ($p > 0.05$).

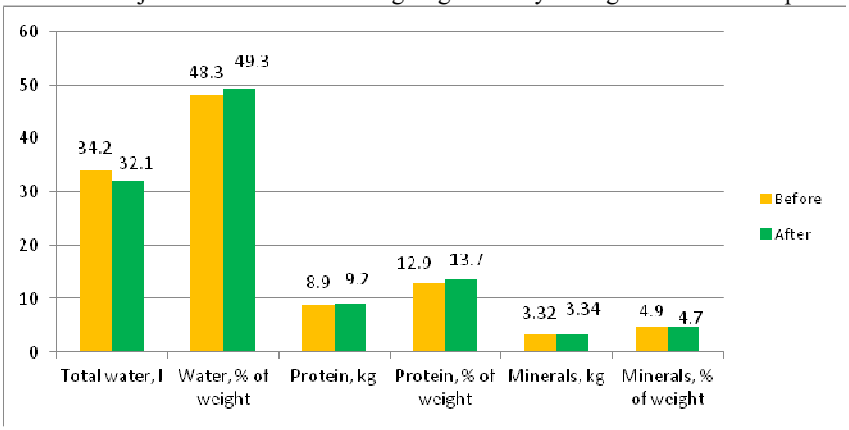

Fig. 2. Changes in body composition in women before and after the fitness program

Analysis of lean mass levels revealed no statistically significant differences across all analyzed segments in the female participants of the study group at the time of evaluation ($p > 0.05$), as shown in Figure 3. However, there was a tendency for absolute lean mass values to increase in the upper limb segments, while a decrease was observed in the lower limb segments.

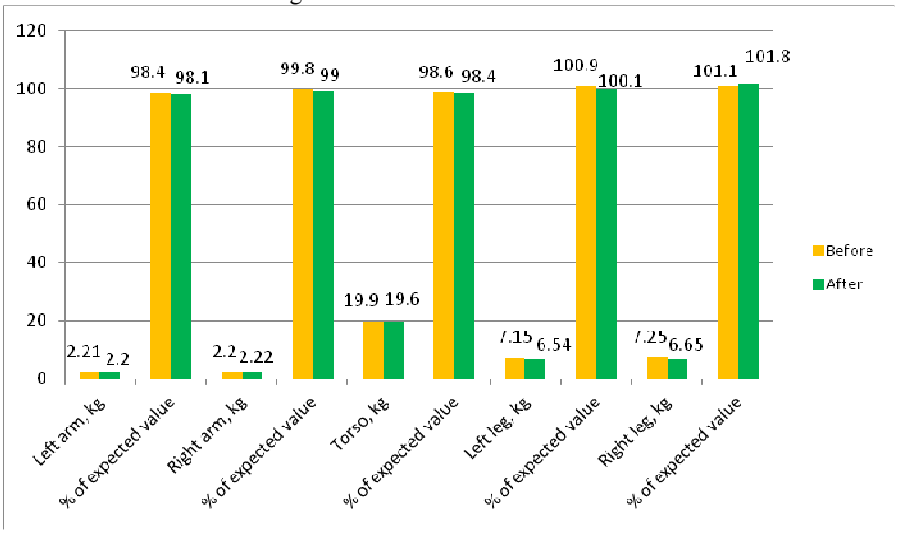

Fig. 3. Changes in segmental lean mass in women before and after the fitness program

Despite these changes, no statistically significant differences were observed in limb asymmetry indices after the program. However, a reduction in the asymmetry between the upper and lower body was noted, with an increased proportion of the upper body relative to the lower ($p = 0.03$, Table 1).

Table 1. Changes in asymmetry indicators in women before and after the fitness program

Indicator	Before, n = 31	After, n = 31
Arm difference L/R	-1.32 (-2.91…0.21)	-0.75 (-3.48…-0.23)
Arm balance (R:B:L), proportion	0.36:0.54:0.06	0.44:0.51:0.08
Leg difference L/R	0.10 (-1.40…0.80)	-0.62 (-2.71…0.29)
Legs balance (L:B:L), proportion	0.20:0.68:0.9	0.37:0.65:0
Upper–lower coefficient	-2.45 (-6.62…1.29)	2.38 (-1.82…6.61)$^{0.03}$
Upper–lower balance (U:B:L), proportion	0:0.9:0.1	0.15:0.79:0.07

Notes: UPPER INDEX – significance level of differences in the indicator after the program compared to initial values; L – left side, R – right side, U – upper body, L – lower body, B – balance

Figure 4 shows changes in segmental fat mass in women before and after the fitness program.

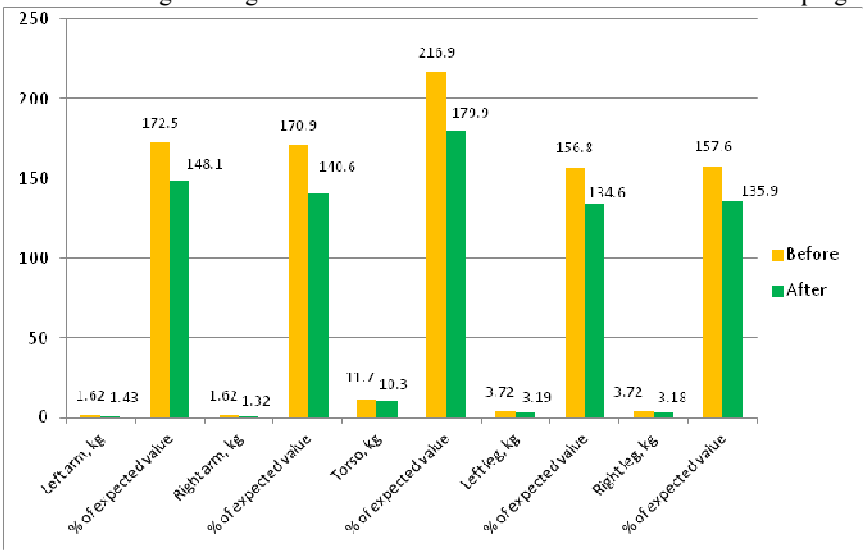

Fig. 4. Changes in adipose tissue mass by segment in women before and after the fitness program

Evaluation of changes in adipose tissue mass by limb segments revealed a statistically significant decrease in the relative mass of adipose tissue in both the upper and lower limb segments (Table 5). A significant reduction of 14.5% in the absolute mass of adipose tissue was observed in both the left and right legs ($p = 0.05$). No significant changes were noted in the adipose tissue mass of the torso in the female subjects during the study ($p > 0.05$). The calculated index values comparing the initial and final measurements in the female participants of the study group are presented in Table 2.

Table 2. Changes in calculated indicators for women before and after the fitness program

Indicator	Before, n = 31	After, n = 31
Waist–hip ratio	0.86 (0.84-0.90)	0.87 (0.84-0.90)
Visceral fat level, cm^2	10.2 (8.1-15.1)	8.0 (7.0-11.7)
Fat-free mass, kg	44.1 (41.0-48.7)	46.5 (41.2-49.4)
Basal (resting) metabolic rate, kcal	1324 (1255-1444)	1376 (1261-1446)

The changes in the calculated indicators for women in the study group did not show statistically significant differences between the initial and final values ($p > 0.05$).

Discussion

Maintaining and improving human health is a priority area of strategic development of modern society (Nauman et al., 2021; Kiema-Junes et al., 2024). In this direction, many health improvement technologies are being developed and implemented in the practice of physical culture, among which various fitness programs have become the most widespread (Nenenko, Maksimova, 2018; Kolokoltsev et al., 2021; Kokarev et al., 2023; Romanova et al., 2023; Rebryna et al., 2024). For the widespread implementation of these practices, a set of research and scientific-practical measures is required to collect evidence of their effectiveness. Analysis of the effectiveness of the implementation of the fitness project "MyHealth" in terms of weight loss and body shape correction in mature women became the basis for conducting the completed scientific study due to insufficiently complete coverage of this issue in the literature. The data we obtained allow us to say that the implementation of the studied program in mature women for three months, despite the existing trend of decreasing body weight and BMI, caused a reliable increase in the values of relative muscle mass and protein in the body with a decrease in the absolute mass of adipose tissue. The decrease in the body fat mass composition is consistent with the results of studies by other authors (Mokhtar et al., 2025; Vieira et al., 2025). A decrease in the amount of fat in the human body has a positive effect on hemodynamics and an increase in the level of cardiorespiratory endurance due to a decrease in the content of epicardial adipose tissue (Sugita et al., 2021). Such dynamics are especially important in connection with a decrease in the level of cardiorespiratory endurance in a significant number of modern people (Smith et al., 2022; Gaesser et al., 2022; Lee et al., 2025).

According to our data, a decrease in the content of adipose tissue in the body of those engaged in fitness exercises is accompanied by a significant increase in the index of the ratio of skeletal muscle mass to adipose tissue mass. Also, the women of the test group showed a reliable decrease in fat mass in the segments of the upper and lower extremities, and to a greater extent in the lower than in the upper. These changes led to a reliable decrease in asymmetry between the lower and upper parts of the body. Such a positive result, which was obtained in the physique of women, allows them to increase the motivational component of fitness technology classes. According to our observations, only three women (9.4%) stopped fitness classes during the 3 months of the project. The reasons for stopping classes were an objective factor associated with a change in place of residence. We agree with the opinion of the authors who point out the importance of motivation for improving the physique of mature women using fitness programs (Mokhtar et al., 2025; Vieira et al., 2025).

According to our data, there are signs of sufficient effectiveness of a three-month course of the tested program, especially in terms of correcting body weight and individual segments in women of the target population. Therefore, such a duration of the program implementation course may be optimal from the standpoint of its availability (both in terms of time/costs and financial component) for the women involved. In this regard, it should be noted that in our study, the percentage of subjects who did not complete the program was less than 10%. Such values can be considered acceptable for fitness practice. Our study allows us to motivate mature women to do fitness, which is due to the positive result obtained in the component composition of the body. This allows us to direct women to change their lifestyle, increase physical activity and achieve the goal of improving their health.

Conclusions

The three-month implementation of the "MyHealth" program in mature women resulted in a reduction in body fat content, along with an increase in relative muscle mass and protein levels. Based on the obtained data, we recommend the MyHealth fitness program for body shape correction and weight loss in mature women. It should be noted that extending the duration of the program could potentially lead to a more significant reduction in fat mass in the target group.

However, the pronounced effects observed after three months of training provide a solid basis for implementing a program of this duration to achieve body and segmental correction. Furthermore, the relatively early appearance of visible positive changes in physique could serve as additional motivation for participants to continue their physical exercise.

Conflicts of interest. The authors declare no conflict of interest.

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