

The Impact of Tabata Training on Body Weight Correction in Women 25–30 Years-Old

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Abstract—Currently, there is a problem of overweight in many people, and this is associated with the reduction in functional reserves of the body. There are many methods for correcting certain components of the body, but most of them come down to rational motor activity in combination with proper nutrition and diet. The Tabata system refers to interval training and is an alternation of 20 second intervals of exercises with maximum intensity with 10 second rest intervals. This cycle is repeated 8 times, and it lasts only 4 minutes. Tabata rounds in their orientation can be different. Regular workouts at least 3 times a week for 45 minutes contribute to fat burning, muscle strengthening and endurance training.

Keywords—tabata system; physical exercises; body weight correction; obesity; 25–30 years old women.

I. INTRODUCTION

In conditions of excessive overload in professional activity, expressed chronic fatigue and constant stress, a person becomes exposed to adverse factors [2]. Sedentary lifestyle provokes overweight, reduced body functionality [4], and this is associated with the reduction of body functional reserves [5].

There are many methods for correcting certain components of the body, but most of them come down to rational motor activity in combination with proper nutrition and diet [1].

The problem of searching for rational approaches to correcting body weight in women currently continues to be extremely urgent [12].

Currently, the fitness industry is able to satisfy a variety of needs, including the normalization of body mass and individual components, offering a range of directions. This allows you to conduct wellness work with those engaged in a fitness club more effectively and individually. [5].

In the scientific literature, the reduction of excess body weight is associated with continuous aerobic exercise for a long time.

However, a number of researchers note that interval training contributes to better fat burning than continuous aerobic exercise [1]. In modern fitness, the interval method is used as a way to improve aerobic processes in the body and to reduce weight effectively [3]. In group classes in a fitness club, training takes place in alternating modes of high and low intensity [13]. At the same time, various fitness equipment is used. This regimen will allow the body to speed up metabolism and to continue burning fat even after training [11]. One of the interval load advantages is that after such training there is no breakdown of muscle fibers, so only fat mass will decrease [10].

Recently, training on the “Tabata system” has become popular. It is a type of high-intensity interval training. In training, 20-second intervals of exercises with maximum intensity alternate with 10 second intervals of rest [6]. This cycle is repeated 8 times, and it lasts only 4 minutes. It is important that the heart rate reaches the anaerobic threshold level. Depending on the total duration and the purpose of the training, there may be several 4-minute Tabata rounds [8]. The advantage of this training type is that one training takes less time (no more than 45 minutes) than training with the traditional one-hour approach [7]. This is important for those who have a busy work schedule and time limit.

Tabata workout is an anaerobic load that promotes fat burning, but does not negatively affect muscle tissue. At the same time, it contributes to the heart muscle training and endurance increase [8].

Basically, for Tabata training, any dynamic strength exercises are used both with the weight of one's own body and with various weights, with gymnastic apparatus, from a variety of initial positions, involving a large number of muscle groups [9].

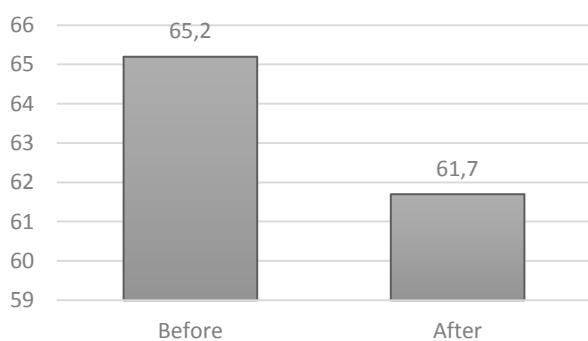


Fig. 1. Average body mass of women in the test group before and after the experiment, kg

For example, various types of running, jumping, squats, lunges, special exercises resembling punches and kicks in boxing, karate, etc.

Exercises that are different combinations of these exercises can also be performed.

Classes in the "Tabata system" are suitable only for those who have some experience in training (at least the average level of training) and have no health contraindications.

Therefore, the aim of our study is to assess the impact of the Tabata system classes in a fitness club on body weight correction in women 25-30 years old.

II. MATERIALS AND METHODS

Research methods: analysis of scientific-methodical and special literature on the subject of research, pedagogical observation, anthropometry, pedagogical experiment, methods of mathematical statistics.

The practical significance of the research results lies in the development of an experimental training methodology on the "Tabata system" and the possibility of using the proposed approach to organizing classes in the field of health-improving physical culture.

The results of the study can be used in the process of health classes in fitness clubs, physical education of students of higher and secondary special educational institutions, as well as students of secondary schools, in training and advanced training of physical culture teachers and sports coaches.

To assess the impact of "Tabata system" classes on the correction of body weight in women in the conditions of a fitness club, in 2018 a 7 months long pedagogical experiment on the basis of "Juice" fitness club in Cheboksary was conducted. For this, a group of 15 women aged 25-30 was determined to be engaged in the "Tabata system" 3 times a week for 45 minutes. The women had some experience in aerobic training - no more than 3 months. They had no health restrictions for practicing high-intensity types of training.

The impact of Tabata training on women's body mass correction was assessed using the following indicators: body

weight (in kg), body fat percentage, Quetelet index (body mass index).

To correct body weight in women, a technique based on exercises using the Tabata system was developed. 45 minute classes were held 3 times a week.

The pedagogical experiment was conditionally divided into 3 stages: involving, training, and impact.

The involving phase lasted 2 months. Exercises were available on coordination. At this stage, 3 Tabata rounds were used in the main part of the class. Of the three Tabata rounds, one was strength building which was aimed at working out a specific muscle group. Between Tabata rounds, the rest was 2 minutes long.

The training phase lasted 4 months. Previously mastered exercises gradually became more complicated due to the addition of jumps, turns, the use of various weights and equipment. In the main part, 4 Tabata rounds were used. Between them, the rest was 2 minutes long. The Tabata rounds alternated among themselves according to the principle of "highly intense - less intense" to restore breathing and to prepare for the maximum load in the next Tabata round.

The impact stage lasted 1 month. 5 Tabata rounds were used, the rest between the rounds was reduced to 1 minute. In addition, in one Tabata round, at least 4 exercises on various muscle groups were performed. Of the 5 Tabata rounds, 3 were highly intense, 2 low-intense.

The patterns used in one Tabata round at different stages were different. In the involving stage, the same exercise was repeated for 4 minutes.

At the training stage:

the same exercise was repeated all 4 minutes.

two exercises alternated among themselves (ABABABAB).

two exercises alternated in pairs (AABBAABB).

one exercise was performed in 4 sets, then another exercise in 4 sets (AAAABB BBBB).

Impact phase: four exercises alternated in pairs (AABC CDD).

III. RESULTS

As it can be seen in Figure 1, the average body mass before the experiment was 65.2 kg. During the experiment, it decreased by 3.5 kg to 61.7 kg. Moreover, a decrease in body mass over the experiment period is observed in all 15 subjects. The greatest decrease in body mass (6 kg) was observed in the test subject with an initial mass of 78 kg. It is important to note that the decrease in body mass occurred due to the decrease in body fat mass. This confirms our assumption that classes on the "Tabata system" contribute to weight loss mainly due to the fat component. However, in this indicator we do not observe significant differences ($p>0.05$), since body

mass could partially increase due to muscle mass. Figures 2 and 3 show the indicators of the subjects in the percentage of body fat mass before and after the experiment. As it can be seen in Figure 2, the average body fat mass over the period of the experiment decreased significantly. Before the experiment, the average indicator was 25.7%, which is generally normal, but approaches the border of excess body fat mass. Of the 15 subjects in 10, this indicator was normal, in 5 - an excess of fat mass was observed (Fig. 3). It should be noted that in 4 representatives the indicator was practically at the border with excess fat mass (25, -25.9%).

After the experiment, the average indicator was 23.6% (Fig. 2), which generally corresponds to the norm. In all 15 subjects, this indicator was normal (Fig. 3). So, during the experiment, the average indicator improved by 2.1% of absolute units. The differences between the results before and after the experiment were significant ($p<0.05$).

Figures 4 and 5 show the indicators of the subjects in the Quetelet index before and after the experiment. Before the experiment, the average Quetelet index was 24.4 units (Fig. 4). It indicates the normal weight-height ratio in general. However, only in 11 representatives of the study group this indicator is normal, of which in 4 subjects the indicator approaches the border of excess body weight (24.7-24.9 units),

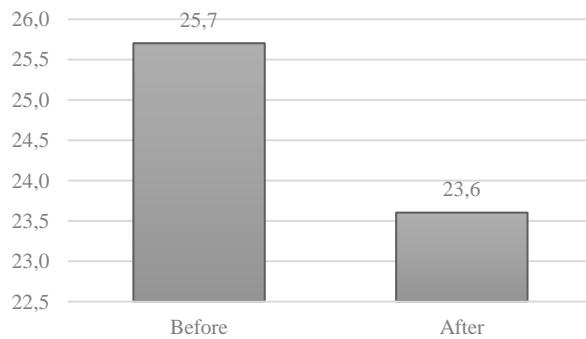


Fig. 2. Average indicators of the test group women in the percentage ratio of body fat mass before and after the experiment, %

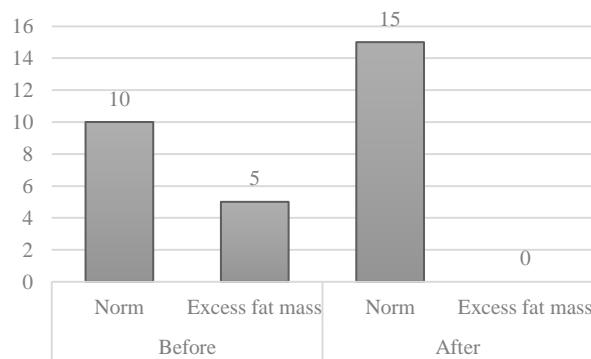


Fig. 3. Indicators of women in the test group in the percent ratio of body fat mass before and after the experiment, number of subjects

and another 4 have excess body weight (Fig. 5).

After the experiment, the indicators in the Quetelet index improved significantly. The average indicator decreased by 1.5 units and amounted 22.9 units. It generally corresponds to the norm (Fig. 4). Moreover, for each representative, the Quetelet index began to correspond to the norm (Fig. 5). The differences between the results before and after the experiment were significant ($p<0.05$).

IV. CONCLUSION

Thus, the results of the study indicate that the classes on the "Tabata system" are effective for correction of body weight in women 25-30 years old. The indicators studied by us have improved significantly. During the experiment, body weight decreased, due to which the indicator in the Quetelet index returned to the norm in all subjects. In the direction of reduction, the percentage of body fat has changed. Significant differences between the indicators before and after the experiment are observed in the Quetelet index and the percentage of body fat.

After the experiment, the subjects noted external changes in physique, which is associated with body weight decrease and strengthened muscles, improved performance, general

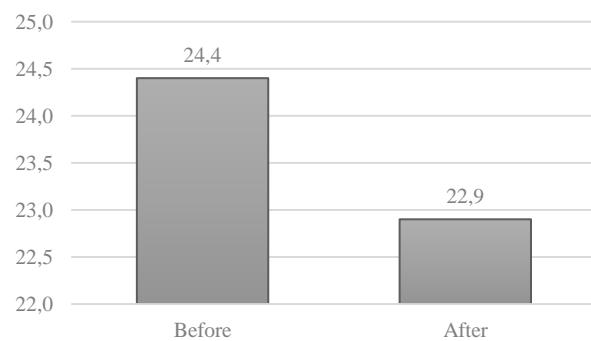


Fig. 4. Average Quetelet index of the test group women before and after the experiment, %

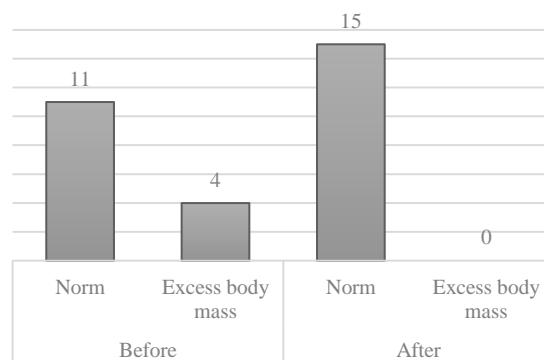


Fig. 5. Indicators of women in the test group in the Quetelet index before and after the experiment, number of subjects

condition and mood, as well as sustained motivation for further studies on the "Tabata system".

References

- [1] Plastinina, V.B., Stolbova, A.N., Berdinskikh, N.M. Interval training as a way to improve aerobic processes in the body and effective weight loss. Society. Science. Innovations.: the collection of scientific articles.- Kirov: Vyatka state University. 2017, pp. 6197-6204.
- [2] Kozupitsa, G. S., Loginov, S.I. The correction of body fat and muscle mass by means of health-improving physical culture. Theory and practice of physical culture. 2013, vol. 3, pp. 83-87.
- [3] Maksimova, E. N., Alekseenkov, A.E. The use of interval training in the process of physical education of students. Science 2020. 2017, vol. 3 (14), pp. 41-45
- [4] Palladina, O. L. Comparative analysis of body composition correction methods in overweight individuals engaged in health fitness. Sports Medicine. 2014, vol. 2014(1), pp. 117-124.
- [5] Slepenchuk, E. I., Slepenchuk, V.M., Belov, A.A. Improving the effectiveness of classes with middle-aged people when correcting body weight in a fitness center. Physical Culture: Upbringing, Education, Training. 2016, vol. 4, pp. 17.
- [6] Safonova, O.A., Voitenko, P.V. Tabata as a direction for improving the process of physical education at the University. Symbol of science. 2016, vol. 6-2 (18), pp. 200-204.
- [7] Tabata: description and features of training, contraindications. URL: <http://www.rutvet.ru/tabata-opisanie-i-osobennosti-trenirovki-protivopokazaniya-9040.html>.
- [8] Timokhina, N.V., Shavyrina, S.V. Tabata system as an effective means of physical education for 3rd-4th year students of the Social faculty. Science 2020. 2017, vol. 3(14), pp. 154-158.
- [9] Training on the Tabata system. URL: <http://pohudejkina.ru/trenirovka-po-sisteme-tabata.html>.
- [10] Zhaowei Kong, Xitao Fan, Shengyan Sun, Lili Song, Qingde Shi, Jinlei Nie. Comparison of High-Intensity Interval Training and Moderate-to-Vigorous Continuous Training for Cardiometabolic Health and Exercise Enjoyment in Obese Young Women: A Randomized Controlled Trial. PLOS ONE. DOI:10.1371/journal.pone.0158589 July 1, 2016.
- [11] Haifeng Zhang, Tom K. Tong, Weifeng Qiu, Xu Zhang, Shi Zhou, Yang Liu, and Yuxiu He. Comparable Effects of High-Intensity Interval Training and Prolonged Continuous Exercise Training on Abdominal Visceral Fat Reduction in Obese Young Women. Journal of Diabetes Research. 2017, vol. 2017, article ID 5071740, 9p. DOI: <https://doi.org/10.1155/2017/5071740>.
- [12] Man-Gyo Lee, Kyung-Shin Park, Do-Ung Kim, Soon-Mi Choi, Hyoung-Jun Kim. Effects of high-intensity exercise training on body composition, abdominal fat loss, and cardiorespiratory fitness in middle-aged Korean females. Applied Physiology, Nutrition, and Metabolism. 2012, 37(6), pp. 1019-1027, <https://doi.org/10.1139/h2012-084>.
- [13] Gökçe Oktay. Investigation of effects of 8 weeks Zumba exercise of women on health related physical fitness factors. European Journal of Physical Education and Sport Science. 2018, vol. 4, 6, pp. 16-24.
- [14] Pyanzin, A.I., Kuzmin, A.A., Pyanzina, N.N. Formation regularities of the functional systems in case of sportsman's organism adaptation to loads. Pedagogico-psychological and medico-biological problems of physical culture ad sport. 2014, 30(1), pp. 130-136. DOI: 10.14526/28_2014_28