Suspension Training Classes as an Effective Means to Reduce the Bodyfat Level in Middle-Aged Women

Zinaida M Kuznetsova1*, Aleksandr S Kuznetsov1, Roman S Nagovitsyn2, Stanislav A Kuznetsov3, Olga G Maksimova3, Elena G Khrisanova4, Mikhail G Kharitonov4 and Aleksandra Yu Anisimova5

1Tchaikovsky State Physical Education Institute, Tchaikovsky, Russia
2Department of Physical Culture and Life Safety, Glazov State Pedagogical Institute, Glazov, Russia
3University of Management "TISBI" Naberezhnye Chelny, Russia
4Department of Theoretical Basis of Physical Education, I. Ya. Yakovlev State Pedagogical University, Cheboksary, Russia
5Department "Physical Culture and Sports Technologies", Izhevsk State Technical University Named After M. T. Kalashnikov", Izhevsk, Russia

*Corresponding Author: Zinaida M Kuznetsova, Tchaikovsky State Physical Education Institute, Tchaikovsky, Russia.
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Abstract

Background: Scientists have recorded a significant increase in a sedentary lifestyle among the middle-aged population. Experts recommend increasing the level of motor activity for women of 30 - 40 years old with the help of innovative technologies in the field of wellness fitness to reduce body obesity at various levels. Study aim is to develop a group training programme for suspension training and prove its effectiveness in lowering the percentage of bodyfat level for women using unconventional diagnostic equipment.

Materials and Methods: Participants - women of 30 - 40 years old who do not have contraindications to physical aerobic exercises (n = 24). The research period is 12 months. Some women (n = 12) carried out group exercises in suspension training mainly with TRX loops. The indicators of the percentage of bodyfat level were evaluated by following methods: weighing on a smart scale Xiaomi Mi Body Composition Scale, measuring with a caliper and hydrodensitometry. The statistical analysis of data was performed using Student’s T-test.

Results: A significant (p < 0.01 and p < 0.05) advantage of women who are engaged in achieving suspension training a higher level of the training process effectiveness for “burning” body fat deposits, compared with other programmes of group and independent aerobic fitness has been revealed.

Conclusion: The research has proved on the basis of mathematical and statistical processing of the results that classes in health-improving group suspension training in a stable motor mode of an aerobic nature improves proportional body composition of middle-aged women. The author’s recommendations on the implementation of non-traditional diagnostic procedures for the percentage of bodyfat level body composition measuring allows to increase motivation to set individual goals for middle-aged women in the field of body shaping.

Keywords: Suspension Training; Women 30 - 40 Years Old; Bodyfat Level; Aerobic Exercise

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Introduction

The main motives of middle-aged people to implement an independent motor activity are health conservation, body correction, lower body fat percentage and increased aerobic and anaerobic fitness [1,2]. Experts in the field of sports and fitness have proved that the implementation of systematic aerobic exercises positively affects the body of middle-aged athletes [3]. To achieve this effect an individually differentiated intensity [4,5] and an optimal exercise duration is required [6]. Aerobic exercise performed in a group or individually helps to strengthen the physical and psychological climate of students [7,8].

One of the most common types of aerobic exercise is exercise complexes with expanders [9]. The use of expanders is especially relevant for the fitness of female athletes who are not recommended to exercise extra weight [10]. Currently, a large number of sports fitness types are offered with the use of various types of expanders, the practical use of which has a variety of applications in physical education activities [6,11]. A set of exercises using these technologies allows to implement a continuous training process in non-specialized conditions [12].

In the direction of health fitness, the use of expanders has only recently been gaining a theoretical and methodological base [13,14]. There are research works on the use of special rubber bands in increasing the level of muscle strength and elasticity, as well as a means of getting rid of problem body areas [13,15]. Data were found on the possibility of using expanders of both high-intensity training and combined aerobic-anaerobic training of moderate intensity in the process of improving body proportions and strengthening women's muscle corset [11]. One of the most innovative directions from the implementation of expanders in the training process is exercises using suspension training [14].

Suspension training is a type of sports fitness for exercising with own body weight. It consists of two slings that are interconnected and fixed at a certain height. Slings should be secured to a solid base. While performing physical exercises in limbo, arms and legs should be firmly inserted into the loops. With the help of this equipment, it is possible to engage not only in aerobic suspension fitness, but also to carry out stretching exercises [11]. Based on the unstable position when leaning on the loops, not only the external muscles, but also the stabilizing muscles are involved during the complex of physical exercises [16]. As experts point out, using the training presented, it is possible to improve the entire body, tone the muscles, strengthen the spine and improve posture [9].

The classes based on suspension training have several levels of load depending on the stiffness of the slings [9]. One of the most common types of loops are TRX loops. They have a differentiation of slings of different resistance. This allows to train each muscle group in accordance with the required load and simultaneously perform exercises on the arms, back and legs. A feature of suspension training is the individualization and differentiation of physical exercises for any level of training: there are both simple exercises for beginners and more complex for advanced ones. During exercising, it is possible to adjust the load by changing the angle and amplitude of movement [11]. The resistance level of this equipment during the exercise is chosen by the trainer, and independently according to individual capabilities. However, in order to obtain a positive training effect, it is necessary to choose a level for performing the load according to the maximum repetition [10].

The minimum pressure on the joint-ligamentous apparatus when performing exercises with cord, tape, wrist and stick expanders for certain muscle groups allows to get a reliable healing and functional effect [14,17]. However, analytical data show that insufficiently studied issues are the application of the described type of suspension training. This trend in health fitness is gaining particular popularity among middle-aged women.

We suggested that the use of suspension training exercises in the practice of group physical exercises for women aged 30 - 40 years will make it possible to achieve a higher level of the training process effectiveness for “burning” body fat compared to other programmes of group and independent fitness training for women.
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Aim of the Study

The aim of the study is to develop a group training programme for suspension training and to prove its effectiveness in lowering the percentage of women's bodyfat level with the help of unconventional diagnostic equipment.

Materials and Methods

Participants: Women of 30 - 40 years old who do not have contraindications to physical aerobic exercises (n = 24). The research period is 12 months. Some women (n = 12) carried out group exercises with suspension training mainly with TRX loops. All women underwent a medical examination and at the time of the study start had no contraindications for aerobic and anaerobic exercises, but without the use of a barbell, dumbbells and weight training equipment. All research participants gave informed consent to participate in the studies and publish the results. The selection of women 30 - 40 years old came from among relatively healthy women with experienced in group exercises in the fitness room. The selection took into account the percentage of women bodyfat [18]. For research, women were selected with a significantly identical percentage of body fat. On average, the percentage of body fat was 32.65 ± 1.87%.

Procedure

The study was conducted for twelve months (April 2018 - March 2019). At the beginning of the study (April), after the first quarter (July), in the middle of the study (October), after the third quarter (January) and at the end (March), the women were tested to check the level of body fat. The implementation of bodyfat monitoring included three methods: caliper measurement [19], hydrodensitometry [20] and weighing on smart scales [21] on a Xiaomi Mi Body Composition Scale device.

Caliper measurement was carried out in four places in women: on the waist 10 cm to the right or left of the navel at the same level, on the biceps in the middle in the front, on the shoulder blade slightly lower at an angle of 45 degrees and on the triceps in the middle between the shoulder and elbow with back side. Subsequently, the obtained figures were compared with the statistical table [22].

Hydrodensitometry was implemented on the basis of underwater weighing of the participants in the experiment. Based on the data obtained during normal weighing on scales, when weighing under water and indicators of residual lung volume, the percentage of bodyfat level was calculated using a special formula [20].

To implement testing on smart scales, Xiaomi Mi Body Composition Scale had to download a special mobile application in advance on a smartphone. The Xiaomi Mi Body Composition Scale device was chosen on the basis of two factors: positive reviews on social networks and the financial possibility of its acquisition. After weighing on the special scales of the presented brand in the smartphone in an online mode, the individual body fat level in percent was determined [23]. As studies show, this measurement method is actively used in the scientific literature on physical education, sports and fitness [21].

Before the start of the experiment, all women were invited to regularly engage in various physical exercises, mainly aerobic exercise, without using weights, such as barbells, dumbbells and weight training equipment, independently and in the group during the study period. Participants (n = 12) of the control group (CG) implemented the training process using various techniques, including various mobile applications on smartphones. Women (n = 12) of the experimental group (EG) carried out the training process on the basis of group exercises with outboard training. He was offered a special training programme for suspension training using TRXloops 2 - 4 times a week, consisting of three blocks of exercises (Table 1).

Each exercise had to be repeated for 8 - 12 repetitions per arm or leg. It was suggested that each participant in the experiment individually or based on the recommendations of the trainer choose slings according to the level of resistance. In the first half of the study, women had to complete the training cycle presented in 1 - 2 rounds 2 - 3 times a week, in the second half of the study 2 - 3 rounds 3 - 4 times a week.

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<table>
<thead>
<tr>
<th>Set of exercises for suspension training using TRX loops</th>
</tr>
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<tbody>
<tr>
<td><strong>1 exercise block: for the upper body</strong></td>
</tr>
<tr>
<td>Bicep Curl</td>
</tr>
<tr>
<td>Tricep press</td>
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<tr>
<td>TRX Twist</td>
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<tr>
<td>Reverse Fly</td>
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<tr>
<td>TRX-pullover</td>
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<tr>
<td><strong>2 block of exercises: for the abdomen and back</strong></td>
</tr>
<tr>
<td>Plank basic</td>
</tr>
<tr>
<td>Crisscross climber</td>
</tr>
<tr>
<td>Forearm Plank</td>
</tr>
<tr>
<td>Side Plank</td>
</tr>
<tr>
<td>Side Plank Thrust</td>
</tr>
<tr>
<td>TRX-Bicycle</td>
</tr>
<tr>
<td><strong>3 block of exercises: for the hips and buttocks</strong></td>
</tr>
<tr>
<td>TRX-Squat</td>
</tr>
<tr>
<td>Suspended Lunge</td>
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<tr>
<td>TRX Forg</td>
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<tr>
<td>Floating Lunge</td>
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<tr>
<td>Side lunge</td>
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<tr>
<td>TRX Bridge</td>
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<tr>
<td>Suspended aductors</td>
</tr>
<tr>
<td>TRX-Burpee</td>
</tr>
<tr>
<td>Hamstring Runner</td>
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</tbody>
</table>

Table 1: Set of exercises for suspension training using TRX loops.

To evaluate the results of the research, the authors used the SPSS20 programme. The level of reliability and reliability of the obtained data was determined using Student’s T-test at \( p < 0.05 \) and \( p < 0.01 \).

**Results**

At the beginning of the experiment (April 2018), all women showed statistically the same results for all three methods for determining the level of body fat (\( p > 0.05 \)). After the first quarter of the experiment (July 2018) and the first half of the study (October 2018), the results of the analysis of the composition of the fat mass of women revealed an improvement in the results in both focus groups. However, mathematical and statistical processing of the results at this stage of the study showed no significance of the difference (\( p > 0.05 \)) between the recorded data and the indicators before the experiment. Nevertheless, monitoring the body composition of the experimental participants using hydrodensitometry showed a slight statistical increase in the EG (\( p < 0.05 \)). Three months later (January 2019) after the third quarter of the experiment, significantly different results were found between EG and CG, not only based on hydrodensitometry (\( p < 0.05 \)) but based on methods for measuring the composition of fat with a caliper (\( p < 0.05 \)).

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At the end of the research (March 2019), positive results were found for both focus groups compared to their initial level based on all diagnostic procedures (p < 0.05). Moreover, the data obtained from EG women using underwater weighing based on hydrodensitometry revealed a statistical significance of the difference (p < 0.01) in comparison with the initial level. A comparative mathematical-statistical analysis between the EG and the CG after the experiment revealed the significance of the experiment on the basis of measurements with a caliper (p < 0.05) and using hydrodensitometry (p < 0.01). However, the statistical processing of the EG and CG data after the experiment, obtained using Xiaomi Mi Body Composition Scale weights, did not show the significance of the difference (p > 0.05). The full test results are presented in figure 1-3.

**Figure 1:** The results of the experimental work based on measurements with a caliper.

**Figure 2:** The results of the experimental work on hydrodensitometry.

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Figure 3: The results of the experimental work on weighing on smart scales Xiaomi Mi Body Composition Scale.

Based on the analysis of the data obtained, the EG revealed the most significant dynamics of a decrease in the fat body level of women. Namely, based on measurements by a caliper from 32.77 ± 1.12% at the beginning of the experiment to 28.59 ± 0.89% after the experiment. In turn, the minimal impact of the annual training process was recorded in the CG - from 32.52 ± 1.37% to 31.4 ± 1.22%. Nevertheless, mathematical and statistical processing of indicators of the body composition of the participants in the experiment (p < 0.01 and p < 0.05) showed a positive trend in reducing the percentage of body fat in both focus groups. Based on the data obtained, it was recorded that the participants in the EG study did not reduce the intensity of the training process, compared with women in the CG. In this regard, the experimental work showed that the statistical results of the impact of the experiment were recorded mainly only at the end of the third quarter of the declared period (January 2019). Despite the reliability of the physical exercises use positive impact according to the method of suspension training, the women of the CG also achieved positive results, however, statistically lower in comparison with the EG. The reliability of the comparative study between the CG and the EG after the experiment is confirmed not only by mathematical and statistical processing of the results (p < 0.01 and p < 0.05). But also based on a visual analysis of the women's bodies with the help of photo diaries: fat folds on the stomach became smaller, which will be possible to get rid of, continuing the training process. Special parts of the EG woman body, such as the hips and buttocks, to which the suspension training was mainly aimed, began to look more fit after the experiment.

Discussion

It has been proved by specialists in the field of health fitness that to reduce the percentage of women’s bodyfat level it is necessary to use innovative aerobic exercise techniques [8,24]. As the results of the experimental work [13] show, hanging training is perfectly used as health and rehabilitation physical activities [11,15]. The use of the presented unconventional equipment during the implementation of physical exercises significantly positively affects the effectiveness of the training process [6]. Nevertheless, the use of expanders cannot be aimed at developing functional qualities and improving the figure of women, as the implementation of a separate training process [9]. Experts prove that the implementation of physical exercises only on the basis of resistance has a reliably short-term positive effect [4]. In contrast to the indicated results of these researches, the positive result obtained in our study is statistically proven. EG girls, who during the experiment, who were engaged mainly with the use of suspended training exercises, recorded a decrease in body fat. This does not contradict other studies [13,15], since the main focus in performance was not on the development of functional and physical improve-

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ment, but on the change in the percentage of fat in the body composition of the research participants. This research, based on the originality and innovativeness of the approach to using physical exercises of suspension training, statistically allowed to achieve a higher level of the training process for efficiency "burning" fat deposits in women EG (p < 0.01 and p < 0.05), in comparison with other fitness training programmes of the KG experiment participants.

The implementation of the training process based on various programmes on the use of suspension training allows diversifying physical exercises, thereby motivating middle-aged women to perform maximum physical activity [21]. In the conducted experimental research, a certain not reliable result of the fitness programme effectiveness using exercises of suspension training was recorded, compared with other types of an aerobic nature motor activity [8]. The results obtained revealed no significant comparative effect on reducing the amount of fat in the body of women 30 - 40 years old based on measurements on smart scales Xiaomi Mi Body Composition Scale. The recorded false results coincide with the data of scientists who used similar devices in their research as diagnostic equipment [2]. Inaccuracy of obtaining the result can be obtained due to incorrect interpretation of data on new equipment and insufficient research work in this direction [25]. For statistical scientific knowledge, in the future it is necessary to use several options for smart scales, including equipment of various brands [21]. In this regard, the experiment used not only innovative modern approaches to the implementation of continuous monitoring of the women body composition [22,24]. But also, the traditional standards of measuring the composition of the participants body in the experiment, in order to identify the percentage of fat [23,26]. Experts argue that it is the use of a caliper measurement [19] or underwater weighing [20] that can provide reliable scientific results. Monitoring carried out in this study using a system of three diagnostic procedures allowed us to obtain statistically significant results and prove the need to use not only modern, but also traditional methods for diagnosing the percentage of bodyfat level in 30 - 40 years old women [27-31].

**Conclusion**

The study has proved that suspension training in the practice of independent exercise is an effective way to lower bodyfat levels in middle-aged women. Through regular classes in a special set of exercises, women reliably received a higher level of "burning" body fat compared to other programmes of independent or group aerobic fitness. The study has proved on the basis of mathematical and statistical processing of the results that the active lifestyle of 30 - 40 years old women in a stable motor mode of aerobic nature improves the proportional indicators of their body composition.

The results of the experiment will be of interest to a wide range of specialists in the field of physical education and sports, fitness trainers, as well as athletes involved in aerobic exercises. The author’s recommendations on the implementation of diagnostic procedures for the percentage body composition measuring of bodyfat level will increase motivation for setting individual goals for middle-aged women in the field of body shaping. Further research will be aimed at studying the influence of the author’s aerobic training programme on different age and qualification categories. Unconventional modern diagnostic procedures for measuring the body composition of women will be studied. An experimental research will cover a larger sample of subjects with different individual capabilities and needs for the motor activity implementation.

**Conflict of Interest**

The authors of the article claim that there is no conflict of interest.

**Bibliography**


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