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FEATURES OF STRENGTH TRAINING FOR WOMEN 30-35 YEARS OLD USING THE "FUNCTIONAL LOOPS TRX" SIMULATOR

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Purpose: to substantiate the effectiveness of using TRX suspension loops exercises for the development of strength qualities in women 30-35 years old.

Material and methods the study was conducted during the year with a group of women 30-35 years old (10 people), engaged in health fitness. To determine the effectiveness of the use of exercises on TRX suspension loops for the development of strength qualities in women of 30-35 years old, analysis and generalization of literary sources, pedagogical observation, testing, pedagogical experiment, methods of mathematical statistics were used.

Results: the analysis of the results of the study showed that after the experiment, the average group indicators of the strength qualities of women 30-35 years old turned out to be significantly higher compared to the results of the initial testing, their increase was from 4 % to 39 %. Also, a comparative analysis of the results of women in the study group using the Student's test showed reliably the best indicators of strength readiness in almost all tests ($p<0,05$; the value of t ranges from 2,11 to 2,79), except for the tests "Countermovement jump" and "Standing

long jump" where the result is also better, but it is not statistically significant (t_p=2,10; p>0,05).

Conclusions: the results obtained showed the effectiveness of using exercises on functional TRX loops for the development of strength qualities in women 30-35 years old.

Keywords: development of strength qualities, fitness program, women 30-35 years old, TRX functional loops simulator, exercises.

Introduction

Public awareness of the importance of human physical health, as one of the fundamental values of human existence, stimulated the development of a whole fitness industry, the pioneer of which, according to E. Le Corre [18], was B. Macfadden (1868-1955), a talented publisher, an active supporter of the athletic direction in the development of physical culture, a specialist in the field of a healthy, physically active lifestyle [13]. Note that every year new fitness technologies appear on the fitness industry market. Their appearance is due to the results of scientific research on the problems of physical activity; the advent of new sports equipment (Pilates rings "Ultra-Fit Circle Mini", plyometric boxes, crossfit ropes, suspension straps "Suspension Training Straps" (TRX-loops), etc.); initiative and creative search of fitness specialists; social demand; fashion, etc. [fourteen]. Analysis of scientific and methodological literature [2, 7, 15] indicates that today it is very popular to use aids in fitness training, in particular functional TRX suspension loops. The existence of various fitness technologies with the use of aids and devices that contribute to an increase in the level of strength readiness of trainees does not yet give grounds to speak of the existence of detailed programs of health-improving trainings using exercises on the TRX Functional Loops simulator for strength training of women 30-35 years old. Thus, the question of the peculiarities of the use of exercises on the TRX simulator in the process of health-improving exercises for women of 30-35 years old is poorly researched, therefore,

it is of interest to scientific research. It is this theoretical and practical collision that determines the problematic situation of this study.

Purpose of the study is to substantiate the effectiveness of the use of exercises on TRX suspension loops for the development of strength qualities in women aged 30-35 years.

Material and Methods of research

The pedagogical experiment, in which 10 people participated, was organized with the aim of increasing the level of strength readiness of women 30-35 years old using exercises on the TRX Functional Loops simulator. A number of scientists Shipunova D., Timokhina N. [15], Golovina V. [5] draw attention to the fact that the full name of exercises with TRX suspension belts is training with its own weight using suspension reconstruction (loops). Their creator is a Marine who created this device in 1990 with the aim of maintaining physical fitness in the absence of any simulators [15]. TRX functional suspension loops are a device consisting of two slings that are connected to each other and have various suspension options at different heights from the floor.

The TRX Functional Loop Trainer (Fig. 1) consists of nylon straps that create resistance using two components: body weight and gravity. After the initial testing of the level of strength readiness, the women trained according to the proposed functional program on TRX loops (Fig. 1). Wellness classes were held 3 times a week for 45-60 minutes. The choice of the volume, intensity and orientation of women's sports activity was determined by their state of health, functional capabilities of the body, the level of physical performance and fitness. [11; 19].

Fig. 1. Exercises on the simulator "Functional loops TRX"

As part of the fitness program with TRX functional suspension loops, strength exercises were performed from various starting positions: *squats* (Squat, Pistol squat, Suspended Lunge, Pistol squat), where the loops are a source of balance and support; *lunges* (Alternative Lunges, Plyo lunge, Cross Floating Lunge, Floating Lunge, Floating Lunge Jump, Side lunge, Suspended Side Lunges); *flexion-extension of the arms (push up)* (Bicep Curl, Tricep extension, Push up, Tricep press, Mountain Climber Pushup, TRX Twist, Dips); *deadlift* (TRX Row, High row, Table Row, Deadlift); *pull up* (Pull up, TRX Twist); *plank* (Plank basic, Plank Up & Down, Ripper, Crisscross climber, Tuck knee, Pike, Forearm Plank, Plank saw, Forearm Plank Climber, Side Plank, Forearm Side Plank, Reverse Suspended abductors, Mountain Climber, Walk Plank); *exercises in the supine position of the leg on TRX loops (*Leg Curl, Bicycle, Bridge, Hip Raise, Suspended aductors, Hamstring Runner) *jumps* (TRX Forg, Wide Jump) and others. Today, there are many exercises, versions and modifications of these simple movements for different parts of the body, therefore, throughout the study, these exercises were performed not only as independent separate exercises for a clearly defined number of times, but also a combination of several exercises was carried out, due to which the level of complexity of that or some other exercise. Since the range of exercises on the TRX loops is very wide, it was not difficult to adjust the intensity of the load. According to scientifically based recommendations [11; 16; 17], when choosing exercises for the development of power qualities of

women 30-35 years old, it was necessary to take into account their suppressive effect on the development of a certain power quality, the possibility of providing local, regional and general effects on the musculoskeletal system and the possibility of accurate dosing of the load. It is important to note that the advantage of doing exercises on the TRX loops, in contrast to traditional strength exercises, was that they were designed to handle every centimeter of the body, because the load was distributed evenly. Thus, exercises on the "Functional loops TRX" simulator integrated strength and balance into a single dynamic format, making it possible to maximize the effectiveness of their implementation.

Results of the research

Analyzing the peculiarities of the use of exercises on the "Functional loops TRX", it is necessary to pay attention to the fact that they are based on a specially displaced center of gravity, which activates the stabilizing muscles (core). In this regard, it should be noted that no matter what exercises are performed, all stabilizers are involved in the work in order to provide the body with balance in the most natural way. It should also be noted that exercises on the "Functional loops TRX" simulator strengthen the stabilizing muscles by performing functional movements and dynamic movements instead of the usual exercises to develop the muscles of the shoulder girdle, back, and abdominals from the starting position. At the same time, a significant load on the stabilizers also occurs during exercises for the muscles of the upper shoulder girdle, chest, back, anterior abdominal wall and muscles of the lower extremities. So, the analysis of the specificity of exercises on the "Functional loops TRX" simulator allows us to make an assumption about their positive influence on the development of strength qualities in women aged 30-35. Therefore, within the framework of the pedagogical experiment to check the effectiveness of the use of TRX suspension loops exercises for the development of power qualities in women aged 30-35, at the end of the study, a final testing was carried out (Table 1).

Table 1

Indicators of strength readiness of women aged 30-35 years during the study (n=10), (t_{gr}=2,23 at p <0.05; t_{gr}=3,17 at p<0,01)

№ i/o	Test name		$\overline{X}$ ±m	$\overline{X}$ ±m	t_p	P	Increase in results, %
			At the beginning of the study	At the end of the study			
1	Flexion and extension of the arms in the supine position (number of times)		8,60±0,62	11,40±0,50	3,52	<0,01	33%
2	Pull-ups on the crossbar (number of times)		4,17±0,32	5,25±0,22	2,79	<0,05	26%
3	Lifting the torso from a supine position (number of times)		27,20±1,34	32,70±1,10	3,18	<0,01	20%
4	Lifting the legs while hanging (number of times)		4,30±0,47	5,70±0,40	2,27	<0,05	32%
5	Holding the leg forward (s)	rights	25,10±0,85	28,60±0,67	3,24	<0,01	14%
		left	22,10±0,71	25,40±0,85	2,99	<0,05	15%
6	Countermovement jump (cm)		17,83±1,91	21,61±1,88	1,42	>0,05	21%
7	Standing long jump (cm)		152,6±4,03	158,6±2,60	1,25	>0,05	4%

As can be seen from the presented materials of Table 1, according to the test "Flexion and extension of the arms in the lying position", the women of the study group showed an average group result of 8,60±0,62 times at the beginning of the study and 11,40±0,50 times at the end. The difference between these indicators is statistically significant, since t_p=3,52>t_{gr}=3,17. This indicates that the use of exercises for the development of strength on the TRX suspension loops contributed to an improvement in the average result by 33% (Table 1). When performing the next test task "Pulling up on the bar"−women 30-35 years old during the study showed the following results: 4,17±0,32 times (initial testing) and 5,25±0,22 times (repeated testing). The difference between these indicators is statistically significant (p<0,05). This means that the results of the study have objectively improved and their growth was 26% (Table 1). In the course of the study, the average group results shown by women 30-35 years old when performing the test "Raising the trunk from a prone position" also received significant shifts. If at the beginning of the study women were able to lift the trunk 27,20±1,34 times, at the end of the study this result increased by 20 % and amounted to 32,70±1,10 times.

At the same time, t_p=3,18> t_{gr}=3,17 with a significant difference in the average group results. Thus, such dynamics of changes in strength readiness indices of women aged 30-35 years is associated with the effectiveness of the use of exercises on the "Functional loops TRX" simulator. Improvement of the results of the level of development of strength qualities also occurred in the next test "Raising the legs in the hanging" and amounted to 32 %. Women who exercised on the "Functional loops TRX" showed a result of 4,30±0,47 times at the beginning of the study and a result of 5,70±0,40 times at the end. According to Student's test, the difference between the average group results in this test is statistically significant, since t_p>t_{gr}. So, the positive changes in the development of power qualities in women aged 30-35 years were due to the different aspects of the influence of the proposed exercises (Table 1).

Determination of the development of power qualities in women aged 30-35 years was also carried out using the tests " Holding the leg forward on the right leg" and " Holding the leg forward on the left leg". While holding the right leg, they showed an average group result of 25,10±0,85 s at the beginning of the study and 28,60±0,67 s at the end. Since t_p=3,24> t_{gr}=3,17, we can conclude that the difference between these indicators is statistically significant. With the holding of the left leg, the women showed an average group result of 22,0±0,71 s at the beginning of the study and 25,40±0,85 s at the end. The difference between these results is also statistically significant, since t_p>t_{gr}. It should be noted that these results allow us to conclude about the effectiveness of using the proposed strength exercises: the improvement in the result on the right leg is 14 %, on the left 15% (Table 1).

In the test "Countermovement jump" women of the study group showed the average group result of initial testing 17,83±1,91 cm, and 21,61±1,88 cm of repeated testing. The difference between these indicators is not statistically significant, since t_p=1,42 <t_{gr}=2,23. However, the obtained indicators of the development of power qualities of women 30-35 years old indicate an improvement in the results in the course of the study by 21 % (Table 1).

When performing the exercise "Standing long jump", the women who took part in the experiment showed a result of 152,6±4,03 cm at the beginning of the study and a result of 158,6±2,60 cm at the end (the improvement in the result during the study was 4%) (Table 1). According to the Student's test, the difference between the mean group values is not statistically significant (p>0,05).

Conclusions / Discussion

The results of the research carried out supplement the theoretical provisions on the problem of human health, as one of the most difficult complex problems of modern science [3]. The results of our research supplement the data of V. B. Zinchenko, Yu. A. Usachev [8], V. M. Osipov [12] and others about the peculiarities of the use of fitness means in order to increase the physical activity of individuals. We also agree with the statement of experts [1, 13; 14] that the development of the fitness industry contributes to its expansion and requires classification and definition of methodological features that determine the use of appropriate means in fitness programs. Experts [2, 4, 6] emphasize that the use of a variety of special simulators allows you to effectively develop a variety of motor qualities and abilities of those involved, improve their technical skills, skills and physical qualities, and also creates the necessary conditions for precise control and management of the most important parameters load. The data obtained have expanded the knowledge of many specialists that strength training is an important component of health fitness, since a properly structured strength training provides significant functional benefits and improves human health and well-being [9; 10, 20]. But for the first time, we have evaluated the effectiveness of using TRX suspension loops exercises for the development of strength qualities in women aged 30-35. So, according to the results of the study, it was established that the use of exercises on TRX suspension loops in health-improving exercises with women of 30-35 years old has a positive effect on the development of their strength qualities. At the end of the experiment, the average group indicators of the strength qualities of women 30-35 years old turned out to be significantly higher compared to the results of the initial testing, their growth ranged from 4 % to 33 %. Also, a

comparative analysis of the results of women in the study group using the Student's test showed significantly better results of strength readiness in almost all tests ($p<0,05$; 0,01), except for the tests "Countermovement jump" and "Standing long jump" where the result is also better, however, it is not statistically significant ($p>0,05$).

Prospects for further research will be aimed at studying other fitness technologies aimed at increasing the motor activity of women 30-35 years old.

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