УДК 613.71

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A set of athletic gymnastics exercises for regulating body weight in physical education classes

Abstract. The article addresses the issues of body weight regulation among students through the application of a set of exercises in athletic gymnastics during physical education classes. It also presents the results of scientific studies that confirm the possibility of using means of athletic gymnastics in physical education to eliminate figure deficiencies, regulate body weight, strengthen abdominal muscles and arm muscles, as well as form proper posture. Recommendations are provided on how to use athletic gymnastics methods that contribute to regulating students' body weight.

Keywords: athletic gymnastics, body weight, traditional art crafts, experimental complex.

According to the latest survey conducted by the All-Russia public opinion research center (2025), it can be confidently stated that more than one-third of young people lead an active lifestyle, for whom interest in physical culture and sports is a fashionable fitness trend [8]. Physical activity allows them to maintain and enhance their health, always stay in optimal physical shape and live a healthy lifestyle [5, pp. 10-14; 10, pp. 9-12].

The active lifestyle of modern youth is due to the accessibility of fitness clubs, as well as the development of various programs for engaging in physical culture and sports, creating new methods for correcting body figures and rational nutrition [2, pp. 138-141; 3, pp. 43-47; 9, pp. 42-49].

The authors of this article have carried out research on the influence of a complex of exercises using tools from athletic gymnastics, which contributes to the development of physical qualities and regulation of body mass in students at the Russian university of traditional art crafts [6, pp. 162-166].

Considering the problem of adapting trainees to physical exertion, it should be noted that the conditions of professional activities of future artists in traditional applied art determine the need to develop resistance not only to mental but also to physical stress in specific areas such as artistic embroidery, artistic lace-making, jewelry making, bone carving, lacquer miniature painting and fabric painting.

During the educational process, learners experience increased exposure to adverse working factors leading to health disorders and functional deviations.

Among negative factors, we can highlight lack of physical activity, monotony of work processes arising from frequent repetitive execution, uncomfortable working postures, dusty rooms in art workshops, odors from coloring substances and paints and possible increase in air temperature.

All these factors over prolonged periods of production activity result in fatigue development. Performing small monotonous labor operations leads to the formation of inhibition processes in higher nervous centers of the brain, resulting in reduced attention level, movement speed and accuracy, visual acuity decline, drowsiness and lethargy.

Prolonged restriction of motor activity and sedentary lifestyle contribute to slowing down the metabolic process, leading to an increase in body weight and accumulation of fat deposits, which determined the choice of topic for this study.

Objective: to develop and experimentally verify the effectiveness of a set of exercises with elements of athletic gymnastics aimed at adjusting the body weight of students.

Based on the relevance of the study, the following hypothesis was formulated: it is assumed that systematic performance of a set of physical exercises using elements of athletic gymnastics will promote control over body weight and improve physical condition.

Research objectives:

- study the peculiarities of applying athletic gymnastics techniques in physical education and sports sessions.

- justify and experimentally test the efficiency of a set of exercises utilizing athletic gymnastics tools aimed at regulating body weight and proportions of students.

To achieve the objectives, the following research methods were used: theoretical analysis and synthesis of data from scientific-methodological literature; pedagogical observation; questionnaire surveys; anthropometric studies; sequential pedagogical experiments; methods of mathematical statistics.

The research took place within the department of physical culture at the Russian university of traditional art crafts between September 2024 and June 2025. A total of eighteen first-year female students aged 18-20 participated in the study. Participants were selected based on their sedentary lifestyle and extended time spent in fixed positions (sitting or standing) according to their field of study.

In the course of the study, anthropometric measurements were taken from the participants. Initial measurements were performed in September 2024, while follow-up measurements were done in June 2025. For comparative purposes, tables were compiled comparing initial data with subsequent findings.

Taking into account the baseline anthropometric data of the students, a series of athletic gymnastic exercises was developed specifically designed to adjust their body weight. This program was implemented between October 2024 and May 2025 in a sports hall equipped with training machines, dumbbells and elastic bands.

Training sessions occurred twice weekly, lasting 90 minutes each session. These workouts were divided into three stages:

1st stage – “Body weight reduction (1 session on exercise equipment, 2 sessions of wellness aerobics)”.

2nd stage – “Figure correction (2 sessions on exercise equipment, 1 session of wellness aerobics)”.

3rd stage – “Consolidation of obtained results (one session on exercise equipment, one session of wellness aerobics, one session of pilates and stretching)".

During the first stage, students trained for six months following an experimental athletically oriented program (table 1).

Table 1

Experimental athletics-oriented complex (first stage)

No	***Name of exercise***	***Muscle group***	***Sets (Number of repetitions)***	***Number***
1.	Hyperextension	Back muscles	3	15 reps
2.	Straight crunches	Abdominal muscles	3	15 reps
3.	Leg extension on machine	Lower limb muscles	3	15 reps
4.	Leg curl on machine	Lower limb muscles	3	15 reps
5.	Lat pull-down	Back muscles	3	15 reps
6.	Seated row	Back muscles	3	15 reps
7.	Push-ups	Chest muscles	3	15 reps
8.	Bench dips	Upper limb muscles	3	15 reps
9.	Kneeling push-ups	Upper limb muscles	3	15 reps
10.	Forearm plank	Abdominal muscles Back muscles	3	30 sec

The goal of the exercises at this stage was to strengthen the thigh, gluteal, abdominal and back muscles of the students. Students were advised to perform three sets for each exercise at a moderate pace. Each approach involved repeating the exercises 15 times. Rest intervals between approaches were 40 seconds.

On the second stage, students worked out using the experimental athletics-oriented complex presented in tables 2 and 3.

The aim of the second stage was to correct the type of student's physique and eliminate anatomical shortcomings. Special emphasis was placed on strength training and stationary machine-based exercises.

During the third stage, students continued to train using the experimental athletics-oriented complex outlined in table 4.

Table 2

Experimental athletics-oriented complex (second stage)

No	*Name of exercise*	*Muscle group*	*Sets (Number of repetitions)*	*Number*
1.	Hyperextension	Back muscles	3	20 reps
2.	Straight legs raise on bench	Abdominal muscles	3	20 reps
3.	Squats	Lower limb muscles, gluteal muscles	3	20 reps
4.	Lunges	Lower limb muscles, gluteal muscles	3	20 reps
5.	Leg curls on machine	Lower limb muscles	3	20 reps
6.	Leg extensions on machine	Lower limb muscles	3	20 reps
7.	Seated hip abduction on machine	Gluteal muscles	3	20 reps
8.	Seated hip adduction on machine	Lower limb muscles	3	20 reps
9.	Glute bridge on mat	Gluteal muscles	3	20 reps
10.	Static wall sit	Lower limb muscles	3	30 sec

Table 3

Experimental athletics-oriented complex (second stage)

No	*Name of exercise*	*Muscle group*	*Sets (Number of repetitions)*	*Number*
1.	Hyperextension	Back muscles	3	20 reps
2.	Oblique crunch	Abdominal muscles	3	20 reps
3.	Pull-ups	Back muscles	3	20 reps
4.	Seated cable row	Back muscles	3	20 reps
5.	Dumbbell chest press	Chest muscles	3	20 reps
6.	Lying dumbbell flyes	Chest muscles	3	20 reps
7.	Dumbbell bicep curls	Upper limb muscles	3	20 reps
8.	Overhead triceps extension with dumbbells	Upper limb muscles	3	20 reps
9.	Side lateral raises	Upper limb muscles	3	20 reps
10.	Plank	Abdominal muscles Back muscles	3	30 sec

Exercises included in the experimental complex at the third stage focused on working all muscle groups of the students and maintaining their muscular tone. Pilates and stretching exercises were utilized to relax muscles, increase joint mobility and provide overall relaxation and tension relief after workouts.

Relaxation exercises were recommended and incorporated into every phase of the experimental training regimen.

Table 4

Experimental athletics-oriented complex (third stage)

No	*Name of exercise*	*Muscle group*	*Sets (Number of repetitions)*	*Number*
1.	Hyperextension	Back muscles	3	15 reps
2.	Straight crunches	Abdominal muscles	3	15 reps
3.	Squats	Lower limb muscles	3	15 reps
4.	Lunges	Gluteal muscles	3	15 reps
5.	Pull-ups	Back muscles	3	15 reps
6.	Seated cable row	Back muscles	3	15 reps
7.	Lying dumbbell flyes	Chest muscles	3	15 reps
8.	Knee push-ups	Upper limb muscles, chest muscles	3	15 reps
9.	Dumbbell bicep curls	Upper limb muscles	3	15 reps

Research findings and discussion

Analysis of the questionnaire responses allowed us to examine the motivations and interests of students towards participation in physical education activities.

The survey revealed that 46% of respondents do not see any point in engaging in physical activity more than once a week, 30% believe that two sessions per week would suffice, 24% consider three sessions per week most effective.

When asked about motivation for participating in physical activities: 50% responded that they engage primarily to lose weight, 37% indicated that improving health and experiencing positive emotions are key drivers, 13% mentioned stress relief, fatigue alleviation and socializing with friends as primary reasons.

Changes in testing indicators before and after the experiment, measured using the methodology "Self-feeling, activity, mood" (SfAM), are summarized in table 5.

Table 5

Average values of SfAM questionnaire indicators

Questionnaire	*Before the experiment M±σ*	*After the experiment M±σ*	*%*
Self-feeling	3,2 ± 5,4	4 ± 5,4	9*
Activity	3,8 ± 5	4,8 ± 5,4	9*
Mood	3,6 ± 5,1	4,3 ± 5,4	7,7*

Note: *when $p < 0.05$

Analysis of the testing results using the SfAM methodology showed that after the experiment, all indicators of the tested individuals increased compared to those prior to the experiment: "self-feeling" and "activity" increased by 9% after the

experiment, while the "mood" indicator increased by 7.7%. The upward trend in the indicators demonstrates the positive effect of the experimental athletic gymnastics complex on the well-being, activity and mood of the students, which became a determining factor in regulating their body weight and proportions.

As a result of the conducted research, it was found that the majority of the initially examined anthropometric indicators of the tested group had normal body weight, accounting for 72.1% of the total number of tested individuals [1, pp. 11-13; 7, pp. 21-24]. The proportion of individuals with excess body weight amounted to 22.1%, whereas those with low body weight constituted 5.8%.

The dynamics of the body weight measurement results (in kg), chest circumference (in cm), waist circumference (in cm), hip circumference (in cm), thigh circumference (in cm) and body mass index (units) both before and after the experiment are presented in table 6.

Table 6

Mean value of anthropometric indicators

Measurements	***Before the experiment*** $M \pm \sigma$	***After the experiment*** $M \pm \sigma$	Δ,%
Body weight	51 ± 95	50 ± 89	5,4*
Chest circumference	85 ± 131	85 ± 121	3,6*
Waist circumference	58 ± 134	58 ± 122	4,6*
Hip circumference	88 ± 134	85 ± 119	7,2*
Thigh circumference	51 ± 70	51 ± 60	5*
Body mass index (BMI)	17,3 ± 28,1	17,3 ± 26,3	5,5*

Note: *when $p < 0.05$

Analysis of the test subjects' main indicators showed that all indicators decreased percentage-wise after the experiment compared to the pre-experiment values. The body weight indicators decreased by 5.4%, chest circumference by 3.6%, waist circumference by 4.6%, hip circumference by 7.2%, thigh circumference by 5%, and body mass index by 5.5%. The results of the study are graphically illustrated in figure 1.

The research results demonstrate that the experimental exercise complex, employing athletic gymnastics tools, used during physical education and sports activities, has a positive effect on the dynamic changes in students' body weight. Consequently, the application of this experimental complex can be deemed effective in improving the anthropometric indicators of students in the context of physical education and sports.

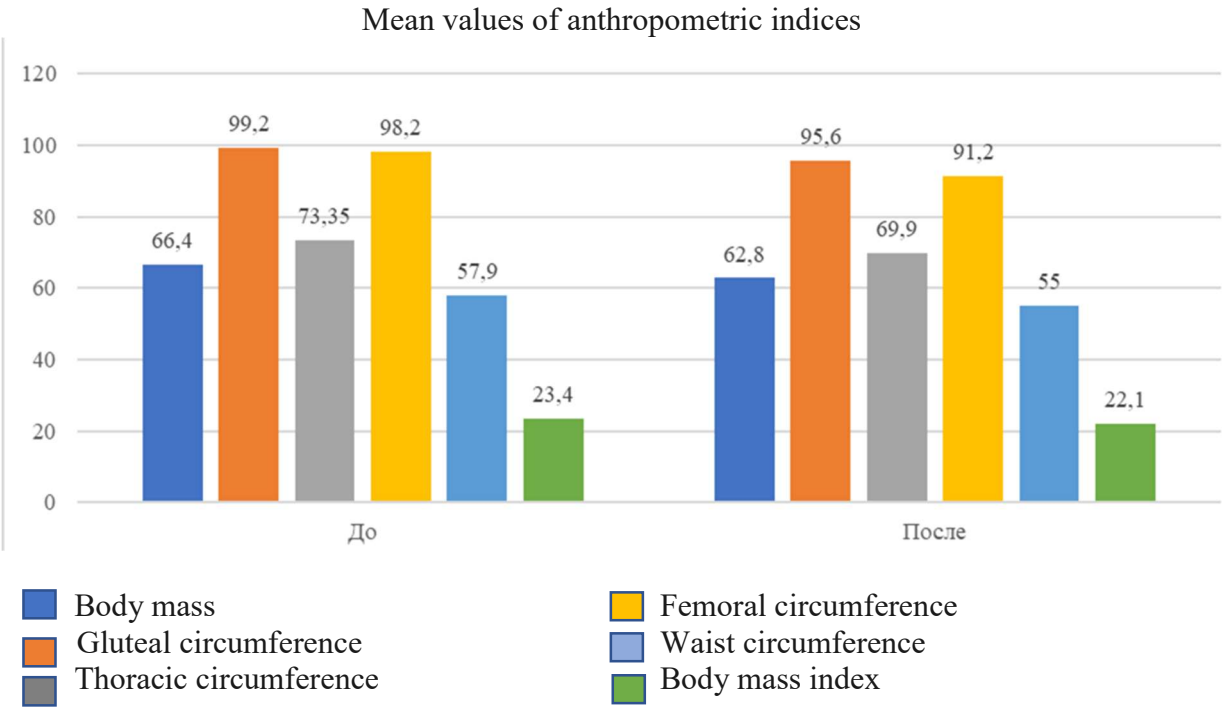

Fig. 1. Research results of anthropometric indicators before and after the experiment

Therefore, based on the aforementioned information, it can be concluded that the experimental exercise complex involving athletic gymnastics tools positively affects the regulation of students' body weight and can be utilized in the educational process at the Russian university of traditional art crafts and its branches to enhance the physical preparedness of students, taking into account practical recommendations. These recommendations involve paying attention to conducting surveys among participants, assessing their psychoemotional state, motivating students to participate in physical education, measuring anthropometric data and holding discussions on healthy lifestyle practices.

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