The specifics of strength training for elite female wrestlers

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Abstract

Objective of the study is to evaluate and analyse the effectiveness of using high-repetition and statodynamic modes of muscular activity among highly skilled female wrestlers during their physical preparation for sporting competitions.

Methods and structure of the study. The experiment was conducted at the Comprehensive School of Higher Sports Excellence in St Petersburg, involving 22 highly skilled female wrestlers. Baseline measurements were taken before the start of the experiment, and again after 3 and 6 months. The main mechanism for utilising the statodynamic mode in the developed programme was the inclusion of additional sets performed with minimal weight and a reduced range of motion, without relaxation of the working muscle, and with a high number of repetitions.

Results and conclusions. The results of the pedagogical experiment showed that a high-repetition training regime, used as a supplement to strength training as part of periodic adjustments to training loads, is an optimal and effective approach for reducing body fat and increasing muscle mass in female wrestlers during their training. A statistically significant improvement in results was observed after six months of the pedagogical experiment in most of the tests studied in the experimental group using a statodynamic training regime.

Keywords: *wrestling, female wrestlers, physical training, competitions, performance, muscle activity.*

Introduction. Modern wrestling is characterised by a rapid increase in the physical fitness requirements for highly skilled athletes. An analysis of current practice shows that dynamically adjusting training loads to take account of the specific nature of the competitive period helps to improve sporting performance [1–2, 6]. In this regard, it is essential to identify the most effective methods for organising the training process, which ensure readiness for competitive demands, stimulate adaptation processes, and maintain optimal performance levels depending on the stage of preparation. Research by Russian scientists confirms that simply increasing the volume and intensity of training loads does not guarantee high sporting results [3–5].

Objective of the study is to evaluate and analyse the effectiveness of using high-repetition and statodynamic modes of muscular activity among highly skilled female wrestlers during their physical preparation for sporting competitions.

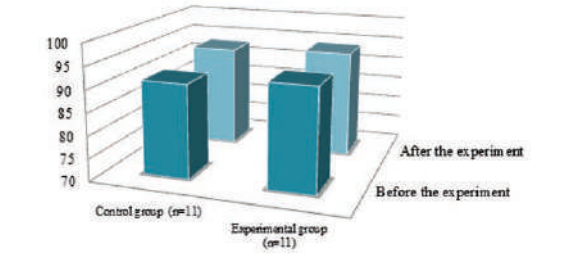
Methods and structure of the study. The study involved a review and analysis of scientific and methodological literature, a questionnaire survey, sports-pedagogical testing, and a pedagogical experiment.

The experiment was conducted at the Comprehensive School of Higher Sports Excellence in St Petersburg, involving 22 highly skilled female wrestlers. The athletes were divided into a control group and an experimental group, with 11 participants in each. The athletes in the control group trained using standard methods, whilst the experimental group followed a specially designed programme. Baseline measurements were taken before the start of the experiment, and again after 3 and 6 months. The main mechanism for utilising the statodynamic mode in the proposed programme was the inclusion of additional sets performed with minimal weight and a reduced range of motion, without relaxing the working muscle, and with a high number of repetitions. These sets were per-

formed after 4–5 strength sets, in the classic style. The following exercises were included as the programme's core exercises: pull-ups, bench press, classic squat, seated dumbbell press, Romanian deadlift, bent-over barbell row, and stationary bodyweight lunges. To adjust the training load, a short range of motion was used, with a time under load of 30–45 seconds. During the recovery period between sets, exercises targeting other muscle groups were performed.

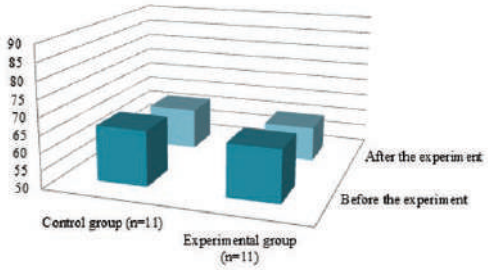
Results of the study and discussion. The results of the questionnaire survey indicate that the athletes are aware of the need to adjust training loads according to the stages of preparation. The results of the experiment demonstrate the effectiveness of the programme developed, which incorporates statodynamic approaches into the training process for female wrestlers.

Strength indicators and muscle mass in the experimental group of female wrestlers increased significantly compared to the control group, whilst waist circumference decreased (Table 1). The results of the experimental phase demonstrate the effectiveness of incorporating statodynamic approaches into the training process for the development of muscle mass and strength in female athletes.



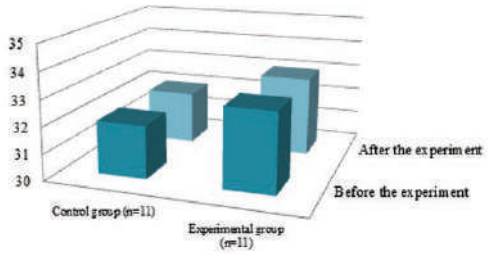
	Control group (n=11)	Experimental group (n=11)
Before the experiment	91	93
After the experiment	93	94

Figure 1. Comparative results of chest circumference measurements in the control and experimental groups (cm)



	Control group (n=11)	Experimental group (n=11)
Before the experiment	66	65
After the experiment	62	60

Figure 2. Comparative results of waist circumference measurements in the control and experimental groups (cm)

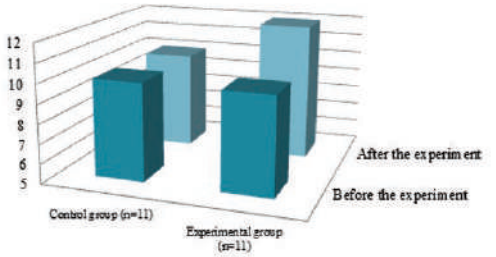


	Control group (n=11)	Experimental group (n=11)
Before the experiment	32	33
After the experiment	32	33

Figure 3. Comparative results of biceps circumference measurements in female athletes in the control and experimental groups (cm)

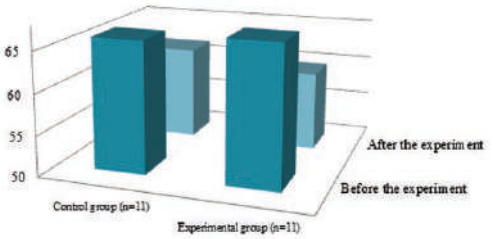
Table 1. Results of a 6-month educational experiment

Exercises and measured parameters	Before the experiment			After 3 months			After 6 months		
	Control group (n=11)	Experimental group (n=11)	p	Control group (n=11)	Experimental group (n=11)	p	Control group (n=11)	Experimental group (n=11)	p
Pull-ups (in 1 min)	11±2	10±4	>0,05	11±3	12±3	>0,05	9±2	11±3	<0,05
Bench press: 30% of body weight (in 1 min)	10±2	10±3	>0,05	12±2	14±3	<0,05	10±2	12±2	<0,05
Classic squat 40% of body weight (in 1 min)	16±2	17±3	>0,05	18±2	21±2	<0,05	16±2	20±2	<0,05
Weight (kg)	66,1±6	67,1±7	>0,05	71,2±9	69,2±9	<0,05	61,6±5	59,7±5	<0,05
Waist circumference (cm)	66±6	65±6	>0,05	67±4	66±6	>0,05	62±3	60±2	<0,05
Chest circumference (cm)	91±5	93±3	>0,05	94±6	94±3	>0,05	93±6	94±3	<0,05
Bicep circumference (cm)	32±2	33±1	>0,05	33±3	34±2	>0,05	32±3	33±2	>0,05



	Control group (n=11)	Experimental group (n=11)
Before the experiment	10	10
After the experiment	10	12

Figure 4. Comparative results for the number of repetitions of the exercise (barbell press) in the control and experimental groups



	Control group (n=11)	Experimental group (n=11)
Before the experiment	66,1	67,1
After the experiment	61,6	59,7

Figure 5. Comparative results of weight measurements for female athletes in the control and experimental groups (kg)

The results of the control measurements demonstrate the effectiveness of the developed method for adjusting training loads for highly skilled female wrestlers.

Conclusions. The results of the pedagogical experiment indicate that a high-repetition regime, when used in conjunction with strength training involving periodic adjustments to training loads, is an optimal and effective component of the training programme for reducing body fat and increasing muscle mass in female wrestlers. During the experiment, a statistically significant improvement in results was observed after six months of the pedagogical experiment in most of the tests studied within the experimental group using a statodynamic training regime.

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