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The effectiveness of the phased application of a set of special exercises aimed at improving athletic fitness during the annual training of middle-distance runners

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Abstract

Purpose: The purpose of this study is to determine the results of a study on the phased application of a set of special exercises aimed at improving the athletic form of middle-distance runners during annual preparatory training and the scientific justification of its practical application. importance. This article analyzes the effectiveness of step-by-step improvement of athletic fitness during annual preparatory training by increasing the final acceleration of middle-distance runners at the stage of athletic improvement.

Methods: As examples of pedagogical tests and control exercises, the following were used: analysis of scientific and methodological literature, pedagogical supervision, organization of research, pedagogical experience, mathematical and statistical methods and analysis of the results obtained.

Results: The indicators of physical fitness of the middle-distance runners of the experimental group were 12.9 ± 0.2 seconds in the 100 m run, and in the control group - 12.8 ± 0.3 seconds. The results of the experimental group in the 200 m run were 26.4 ± 0.7 seconds, and in the control group - 26.1 ± 1.5 seconds. The results of the experimental group in the 400 m run were 55,1±1,1 seconds, in the control group 54,9±1,2 seconds. The results of the experimental group in the 600 m run were 91,4±1,1 seconds, in the control group 91,2±0,9 seconds. The results of the experimental group in the 800 m run were 122,4±1,5 seconds, in the control group 122,2±1,7 seconds. The results of the experimental group in the 1000 m run were 172,3±1,3 seconds, in the control group 171,6±1,9 seconds. The results of the experimental group in the 1500 m run were 255,2±2,8 seconds, in the control group 254,7±2,6 seconds. The long jump test was 227±4.49 cm in the experimental group and 229±5.24 cm in the control group. The triple jump test was 717±17,1 cm in the experimental group and in the control group 719±24,2 cm.

Conlcusion: According to the results of the current study and pedagogical observation, it turned out that in the study to determine the physical fitness of middle-distance runners, there was no significant difference between the level of physical fitness of the subjects of the experimental and control groups. But when we studied and compared the results obtained at the beginning of this study, it turned out that the athletic form of the athletes of the experimental and control groups was not sufficiently formed.

Keywords: Preparatory training, competitive period, physical training, cumulative effectiveness, tool, athletic form, step-by-step improvement.

Introduction

After an athlete gets fit, he is faced with the task of maintaining it throughout all responsible competitions and turning it into the achievement of sporting achievements (1, 4,5).

Athletic fitness is not only a condition, but also a process, a process of continuous improvement of all qualities, skills, and abilities that show readiness to achieve success in sports (6, 7).

In a highly trained state (in athletic form), an athlete can show better data on physical, technical and tactical results in his activities (2, 3).

Middle-distance runners, based on the development of speed-strength endurance during annual preparatory training, using special exercises aimed at increasing final acceleration, achieving stable athletic fitness during competitions and improving it during year-round competitions, creates an opportunity to ensure the growth of athletic results.

Methods

The current study was conducted from September 2021 to August 2022. Coaches and athletes were provided with information about the duration of special exercises after training, rest intervals.

In the study, the following pedagogical tests were used to determine the physical fitness of athletes: The 100 m sprint, 200 m high-speed sprint, 400 m sprint for high-speed endurance, 600 m, 800 m and 1000 m sprints for high-speed endurance, 1500 m sprint for special endurance, as well as fast explosive leg strength in the long jump and triple jump from the place were used.

Results and discussion

The results of the study showed that the annual training cycle of middle-distance runners should be diverse in content and form, depending on goals and objectives, training periods and the season. Since conducting the same training leads to a decrease in the effectiveness of athletes,

therefore, when solving tasks set before training, they use different means and methods to achieve the desired results. The complexity, volume and intensity of exercises, the number, time, season and physical fitness of athletes vary. Conducting exercises after the preparatory and final part of the workout in the form of recovery runs and additional exercises is one of the means to achieve the overall effectiveness of training and ensure a high level of fitness formation.

Taking into account such factors as the goals and objectives of training in the annual training cycle of middle-distance runners, the calendar of annual competitions and the participation of athletes in them, this set of exercises was specially designed for training mesocycles (see table 1).

The use of a special set of exercises at the stages of the annual training of middle-distance runners

It is recommended to perform this set of exercises lasting 20-30 minutes, designed for the first preparatory stage of the annual training cycle of middle-distance runners. The positive effectiveness of exercises is achieved mainly through the use of equal load and minimum rest intervals.

Such training should be carried out once or twice according to a weekly scheme. Before the main workout, the following exercises are additionally performed. The following is the procedure for using these sets of exercises (see table 1).

Based on a step-by-step system of the annual training process of middle-distance runners at the stage of sports improvement participating in the experiment, a set of

Table 1. Description of the application of a set of exercises at the preparatory stage I of middle distance runners (part I)

№	*The content of the exercises*	*The norm of exercise*	*Rest*	*Organizational and methodological guidelines*
	FIRST SET OF EXERCISES (EXERCISES PERFORMED LYING DOWN)			
1	Start state. Lying on back, arms out to the sides, the right hand touches the left leg, then the left hand touches the right leg	4x4 times	10 s	The exercise should be performed according to the standard interval method
2	Start state. Lying on stomach, arms out to the sides, the right hand touches the left leg, then the left hand touches the right leg	4x4 times	10 s	The exercise should be performed according to the standard interval
3	Start state. Lying on your back, legs straight, you can raise and lower one leg with resistance (with a partner), and if there is no partner, you can use the resistance of the other leg	4x4 times	10 s	The exercise should be performed according to the standard interval method
4	Start state. Lying on side, lifting leg straight and side, overcoming the resistance of the partner pressing down, then down, overcoming the resistance of the partner pressing up, the same with the other leg	4x4 times, the same on the left and right sides	10 s	The exercise should be performed according to the standard interval method
5	Start state. Lie down on stomach, lift back and overcome partner's resistance with straight foot. It's the same with the other leg.	4x4 times, the same on the left and right sides	10 s	The exercise should be performed according to the standard interval

Table 2. Description of the application of a set of exercises at the preparatory stage I of middle distance runners (part II)

№	The content of the exercises	The norm of exercise	Rest	Organizational and methodological guidelines
SECOND SET OF EXERCISES (THE EXERCISE RUNNING ON A 100 M SEGMENT IS PERFORMED WITH STRAIGHT ARMS OUTSTRETCHED)				
1	Running of minimum duration with high climbing	During 30 seconds	Without an interval	The exercise should be performed in a standard continuous way
2	Jumping on one leg, changing legs and "catching" the support with a strong active forward movement, the bent leg is thrown out	During 30 seconds	Without an interval	The exercise should be performed in a standard continuous way
3	Fast stretching with forward movement of the legs, straight grip in front of the chest	During 30 seconds	Without an interval	The exercise should be performed in a standard continuous way
4	"Wheel" (running with a high hip lift with the foot moving forward)	During 30 seconds	Without an interval	The exercise should be performed in a standard continuous way
5	Step to the side, lifting your legs while actively moving hips	During 30 seconds	Without an interval	The exercise should be performed in a standard continuous way

exercises coordinating the work of antagonistic synergistic muscles of the thigh and calf was used and the following results were achieved.

The physical fitness indicators of the middle-distance runners of the experimental group improved by 12.9 ±0.2 seconds at the beginning of the study in the 100 m run, by 12.5 ±0.3 seconds at the end of the study, an

Table 3. Description of the application of a set of exercises at the preparatory stage I of middle distance runners (part III)

№	The content of the exercises	The norm of exercise	Rest	Organizational and methodological guidelines
THIRD SET OF EXERCISES (ABOVE THE OBSTACLES HOLD IT IN OUTSTRETCHED HANDS)				
1	Jump over set obstacles (10 obstacles), forcing the leg to bend (otherwise it cannot be missed)	5 times	30 s	The exercise should be performed according to the standard interval method
2	Then the fences are placed as usual, after 2 meters	5 times	30 s	The exercise should be performed according to the standard interval method
3	Jumping over obstacles at every step	5 times	30 s	The exercise should be performed according to the standard interval method
4	Standing to the side of an obstacle, with a straight leg, crossing an obstacle with a forward slide (with a jump)	5 times	30 s	The exercise should be performed according to the standard interval method

Table 4. Description of the application of a set of exercises at the preparatory stage I of middle distance runners (part IV)

№	The content of the exercises	The norm of exercise	Rest	Organizational and methodological guidelines
	FOURTH SET OF EXERCISES (STRENGTH EXERCISES TO STRENGTHEN THE MUSCLES OF THE BACK AND ABDOMEN)			
1	Lying on his stomach, lifting his torso and holding on to the barbell on his back, the partner holds on to their legs	4 times	10 s	The exercise should be performed according to the standard interval method
2	Lying on back, lifting the body, holding the back of head. The starting state kneeling, sitting on the ground to one side, rising up, then sitting down to the other side, holding the barbell with outstretched arms	4 times	10 s	The exercise should be performed according to the standard interval method
3	Kneeling, tilt the pelvis forward, holding the barbell at the shoulders	4 times	10 s	The exercise should be performed according to the standard interval method
4	"Block-step", lying on back, straight grip – by the head and start state	4 times	10 s	The exercise should be performed according to the standard interval method
5	"Block-step", getting up and turning down and onto the other leg, holding hands right in front of chest	4 times	10 s	The exercise should be performed according to the standard interval method
6	Standing on one leg (the other is held by the partner), grabbing the barbell with outstretched arms, turning the pelvis 180 degrees	4 times	10 s	The exercise should be performed according to the standard interval method
7	Lying on his back (the partner holds his legs), holding the barbell at arm's length, lifting the pelvis	4 times	10 s	The exercise should be performed according to the standard interval method

increase of 0.4 seconds improved by 3.3%, in the control group at the beginning of the study by 12.8 ±0.3 seconds, at the end of the study by 12.6±0.4 seconds An increase of 0.2 seconds increased by 2.4%. In the 200 m run, the experimental group showed an improvement of 26.4±0.7 seconds at the beginning of the study, an increase of 25.1±0.5 seconds at the end of the study by 1.3 seconds by 5.2%, the control group showed an improvement of 26.1±1.5 seconds at the beginning of the study, an increase of 25.4±1.1 seconds at the end of the study by 0.7%. the second was 3.1%. In the experimental group, 400 m running showed an improvement of 55.1±1.1 seconds at the beginning of the study, an increase of 53.0± 1.2 seconds at the end of the study by 2.1 seconds 4%, in the control group an increase of 54.9±1.2 seconds at the beginning of the study by 53.2± 1.5 seconds at the end of the study by 1.7 seconds 3.2%. In the 600 m run in the experimental group, 91.4 ± 1.1 seconds at the beginning of the study and 89.3±0.9 seconds at the end of the study. The increase was 2.1 seconds by 2.3%, in the control group 91.2±0.9 seconds at the beginning of the study and 90.1±1.1 seconds at the end of the study with an increase of 1.1 seconds by 1.4%.

In the experimental group, in the 800 m run at the beginning of the study, 122.4±1.5 seconds, at the end of the study 118.9±1.4, an increase of 3.2 seconds improved by 2.7%, in the control group, the increase was 122.2±1.7 seconds at the beginning of the study and

Table 5. Description of the application of a set of exercises at the preparatory stage I of middle distance runners (part V)

№	The content of the exercises	The norm of exercise	Rest	Organizational and methodological guidelines
FIFTH SET OF EXERCISES (JUMPING EXERCISES)				
1	Standing, holding hands directly in front of chest, sitting down, rolling back and forth, then immediately jumping up	10 times	20 s	The exercise should be performed according to the standard interval method
2	Standing, brisk walking, turning into high-frequency jogging, both legs in the middle and back, without twisting	30 times	20 s	The exercise should be performed according to the standard interval method
3	While standing, jump back and forth (keeping arms straight), then the other leg	30 marta	20 s	The exercise should be performed according to the standard interval method
4	Standing, push-ups, sideways, legs and knees should always work	10 times	20 s	The exercise should be performed according to the standard interval method
5	"Frog jumping". correctly hold the turnstile from above while standing; squatting, jumping over each turnstile, then lifting. Jump over each turnstile on one leg (the other leg is held by a partner).	10 times	20 s	The exercise should be performed according to the standard interval method
This set of exercises should be completed by running 400 m (the pace is slightly faster than jogging). These exercises are aimed at increasing hip joint mobility and strengthening leg muscles.				

120.1±1.8 seconds at the end of the study with an increase of 2.1 seconds by 1.7% at the end research.

When running 1000 m in the experimental group, an increase of 172.3±1.3 seconds at the beginning of the study, an increase of 168.1±1.9 seconds at the end of the study improved by 4.2 seconds by 2.5%, in the control group, an increase of 171.6±1.9 seconds at the beginning of the study and an increase of 169.9±2.3 seconds at the end of the study was 1.7 seconds by 1.1%. In the experimental group at a distance of 1500 m at the beginning of the study, 255.2±2.8 seconds, at the end of the study 249.8±2.9 seconds, an increase of 5.4 seconds, an increase of 2.2%, in the control group at the beginning of the study 254.7±2.6 seconds, an increase of 253.5±2.3 seconds, an increase of 1.7 seconds, an increase of 0.5%. In the experimental group for the standing long jump test, the distance of 227±4.49 cm at the beginning of the study, at the end of the study, the distance of 237±5.25 cm improved by 10 cm, 4.2%, in the control group, the distance of 229±5.24 cm at the beginning of the study and 235±4.97 cm at the end of the study increased by 6 cm 2.5%. In the experimental group for the triple long jump test from a standing position of 717±17.1 cm at the beginning of the study, an increase of 742±16.94 cm at the end of the study improved by 25 cm by 3.3%, in the control group an increase of 719±24.2 cm at the beginning of the study, an increase of 734±21.52 cm at the end of the study was 19 cm by 2.6%, which was proved by the results obtained (see table 2).

An analysis of the results obtained at the end of the study with middle-distance runners showed that the athletic form of the athletes of the experimental group was stable and

increased compared with the athletic form of the athletes of the control group.

Conclusion

The physical fitness indicators of the middle-distance runners participating in the study at the beginning of the study showed an increase in 100 m running in the experimental group by 0.4 seconds by 3.3%, and in the control group by 0.2 seconds by 2.4%. In the 200 m run in the experimental group, the increase was 1.3 seconds by 5.2%, in the control group -0.7 seconds by 3.1%. In the experimental group, when running 400 m, the gain improved by 2.1 seconds by 4%, in the control group the increase was 1.7 seconds by 3.2%.

At the beginning of the study, in the experimental group, when running at 600 m, the increase was 2.1 seconds by 2.3%, in the control group the increase was 1.1 seconds by 1.4%. The increase in the experimental group in the 800 m run was 3.2 seconds by 2.7%, in the control group the increase was 2.1 seconds by 1.7%. In the 1000 m run in the experimental group, the increase was 4.2 seconds by 2.5%, in the control group, the increase was 1.7 seconds by 1.1%. In the 1500 m run in the experimental group, the increase was 5.4 seconds by 2.2%, in the control group, the increase was 1.7 seconds by 0.5%. In the long jump from a standing position, distance improved by 10 cm, 4.2% in the experimental group, and in the control group, distance improved by 6 cm by 2.5%. In the triple long jump from a standing position, the distance in the experimental group improved by 25 cm by 3.3%, in the control group, the results were recorded with a distance of 19 cm by 2.6%.

It is proved that the use in the pedagogical experience of the complex of special exercises developed by us to improve athletic form during the annual training of middle-distance runners is an effective approach due to the results obtained and stable results at competitions.

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