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EFFICIENCY OF THE PROGRAM OF THE TRAINING PROCESS OF YOUNG ATHLETES OF 13-14 YEARS DURING THE FIRST MACROCYCLE OF ANNUAL TRAINING (ON THE EXAMPLE OF SPRINTER RUNNING)

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Purpose: to develop and prove the effectiveness of the training process program for athletes-sprinters during the first macrocycle of an annual training.

Material and methods: the experiment involved ten athletes, ranged from 13-14 years old who train in the athletics section of secondary educational institution. The following research methods were used: theoretical analysis and generalization of scientific and methodological literature data, pedagogical experiment, pedagogical testing and methods of mathematical statistics.

Results: it was determined that athletes at the stage of preliminary basic training use two-cycle planning of an annual training ("double" cycle). The structure of planning the training process in the first macrocycle is revealed on periods, stages, mesocycles. The program of the training process of athletes during the first macrocycle of the "double" cycle of an annual training is developed.

Conclusions: the effectiveness of the training process program among athletes was proved on the basis of increasing their physical preparedness and sports achievements in the track and field athletics competitions.

Keywords: athletics, program, macrocycle, physical strength, young sprinters.

Introduction

V.M. Platonov [11] formulated the main tasks of training athletes at the stage of preliminary basic training: 1) versatile development of motor skills, 2) health promotion, 3) elimination of shortcomings in the level of their physical development and physical fitness, 4) creation of motor potential that involves the formation of motor skills (corresponding to the specifics of future sports specialization), 5) the formation of a lasting interest of athletes in sports improvement in the chosen sport.

The athletics curriculum for CYSS states that the technical training at the preliminary basic training stage is based on the versatile material of the sport selected for the athlete's specialization.For example, in sprinting running the technique of starting exercises (start from walking and slow running, start from falling, leaning on one arm, low start in easy and complicated conditions), special running exercises, running technique (movements of arms, legs, torso position, breathing technique, etc.), running with variable speed, sprint running (smooth running, running up, on sand, etc.), technique of various jumping exercises, pushing the core and stuffed ball are mastered [1].

In the process of physical training of young athletes, special attention should be paid to the development of various forms of speed, as well as speed and strength, coordination skills and flexibility. Given the high growth rate of these motor abilities, it is inappropriate to plan at this stage sets of exercises with high intensity and short breaks, as well as training sessions with heavy loads [3].

Athletics experts [1] recommended the following distribution of the ratio of types of work of different predominant orientation at the stage of preliminary basic training, which is presented in table 1.

Table 1

The ratio of types of sports training of athletes at the stage of preliminary basic training

Stage of long-term preparation	General training,%	Auxiliary training,%	Special training,%	Technical training,%	Annual work volume,%
Previous base training	40	30	15	15	250-600

In the sports training of young athletes it is necessary to take into account a number of methodological and organizational features [12]:

1) training sessions should not be focused on sports achievements at the stages of initial and preliminary basic training;

2) the load must correspond to the functional capabilities of the biological state of the athlete's body;

3) in the training process it is necessary to adhere to a rational regime, ensuring household hygiene, proper organization of control over the health and physical development of the young athlete;

4) with increasing level of training of athletes gradually decreases the percentage of general physical training and increases the percentage of special physical training.

Scientists V.M. Platonov [11] and L.P. Matveev [9] are the founders of the theory of building the training of athletes in the long-term process of sports improvement. According to them, the construction of annual training can be carried out on the basis of one macrocycle - one-cycle training, two - two-cycle, three - three-cycle and so on. In each macrocycle there are periods: preparatory, competitive and transitional.

At the same time, in the multi-cycle construction of the training process during the year, different options are used: "double", "built" and so on. Because the

transition periods between the first and second, second and third, etc. macrocycles are not planned (L.P. Matveev, 1977; V.M. Platonov, 1986).

Analysis of the special literature showed that young athletes at the stage of initial and preliminary basic training are widely used two-cycle planning of annual training [4; 7]. The first macrocycle has a basic character, provides comprehensive training and performance in competitions, not as responsible as the main competitions of the year. The training process in the second macrocycle acquires a specific character, the preparation is aimed at a successful performance at the main competitions of the year [5; 8; 10].

V. Dobrynsky, J. Mudryk [6], O. Vysotska, V. Sergienko [2] and others studied the issues of improving the physical training of young athletes.

Thus, the issues of structure and content of two-cycle planning of annual training of young athletes at the stage of preliminary basic training in the scientific and educational literature are insufficiently covered, which led to the choice of the topic of our study.

Connection of research with scientific programs, plans, topics. This work was performed in accordance with the plan of research work of the Department of Theory and Methods of Olympic and Professional Sports of the Central Ukrainian State Pedagogical University named after Volodymyr Vynnychenko.

The purpose of the study: construction of the training process in the first macrocycle of the two-cycle annual training of sprinters 13-14 years old to competitions in athletics duel.

Objectives of the study:

1. Based on the analysis of scientific and methodological literature to study the planning of annual training of sprinters at the stage of preliminary basic training.

2. To develop the program of preparation of track and field athletes-sprinters of 13-14 years for competitions in track and field dueling during the first macrocycle of two-cycle planning of annual training and to define its efficiency.

Material and methods

The study involved ten athletes aged 13-14, who train in the athletics club of the basic educational institution "Dmitrov secondary school of I-III degrees named after Taras Shevchenko" Dmitrov village council of Znamyansky district of Kirovograd region. Athletes specialize in 60 and 100 m running, have 3-4 years of sports training experience and sports qualification – III and II youth categories in athletics.

The following methods are used to solve the research problems: analysis of scientific and educational literature, pedagogical experiment, pedagogical testing, methods of mathematical statistics.

Results of the research

In the course of the research the structure of planning the training process of sprint athletes in the first macrocycle of two-cycle annual training was developed (Table 2).

Table 2

The structure of planning the training process in the first macrocycle of two-cycle annual training of athletes 13-14 years

Macrocycle																
Periods	Preparatory												Winter competitive			
Stages	General preparatory								Special training				Competative			
Mesocycles	Retracting				Retracting				Base				Competative			
Months	September				October				November				December			
Microcycles	R	R	R	S	R	R	S	S	R	S	S	RM	SM	CM	RM	RM
Competition, h.								2						2		
Recovery tools, h		2		2		2		2		2		2		2		2

Note: R - retracting microcycle, S - shock microcycle, RM - reducing microcycle, SP - supply microcycle, CM - competitive microcycle.

In the structure of planning the training process of athletes during the first macrocycle of two-cycle annual training there are two periods: preparatory and winter competition, as well as three stages: general training (September-October), special training (November) and competitive (December). Thus, athletes at the stage

of preliminary basic training use two-cycle planning of annual training ("double" cycle). Because, with two-cycle planning of annual training between macrocycles there is no transition period. The competitive period of the first macrocycle smoothly passes into the preparatory period of the next (L.P. Matveev, 1977; V.M. Platonov. 1986).

The planning of the training process in the general preparatory stage involved two retracting mesocycles. The task of retracting mesocycles is to increase the level of general and auxiliary physical fitness and functional capabilities of athletes' body systems, strengthen the musculoskeletal system and the ability of athletes to withstand loads, the value of which is gradually increasing.

Upon completion of the general preparatory stage, the participation of athletes in the open Championship of the Kirovohrad region in track and field duel among boys and girls born in 2005-2006 (October 26, 2019, Kropyvnytskyi) is planned to increase their training and competitive experience. The athletics duel, in which the athletes took part, includes a 60-meter hurdles and a 60-meter sprint, as well as a 60-meter hurdles and a 400-meter run.

The special-preparatory stage is represented by the basic mesocycle, which provides purposeful special training, by increasing the percentage of special-preparatory exercises as close as possible to the competitive ones.

The winter racing period is represented by a racing mesocycle. The participation of athletes in the main competitions of the macrocycle - the Championship of Cherkasy region in athletics duel among boys and girls born in 2005-2006 (December 7, 2019, Cherkasy) is planned.

During the development of the program of the training process of athletes during the first macrocycle of the "double" annual cycle of training in the athletics club, we focused on the athletics curriculum for CYSS. Thus, athletes 13-14 years of the first year of training at the stage of preliminary basic training, according to the athletics program for CYSS, have 12 hours of weekly workload (Table 3) [1]. At the same time, the athletes in the athletics club at the basic educational institution have only 8 hours of weekly workload.

Table 3

Minimum age of athletes, minimum group size, weekly training regime in athletics at the stage of preliminary basic training at CYSS

Stage of sports training	Year of study	Number of athletes in the group	Age, years	Requirements for sports training	Weekly training load, hours
Preliminary basic training	1	8	13-14	III jun.-II jun.	12
	2	8	14-15	II jun.-I jun	14
	3	7	15-16	I jun.-III	18
	More than 3 years	6	16-17	III-II	20

The developed program of the training process of athletes during the first macrocycle of training consisted of a program of four mesocycles. In turn, the program of each mesocycle consisted of a program of four-week microcycles. The program of the I and II microcycles was similar, as well as the program of the III and IV microcycles of each mesocycle. The means are the same, but the duration (number of approaches and series) and intensity of work in the second microcycle is greater than in the first, as well as in the fourth microcycle, more than in the third.

In the microcycles of the first *retracting mesocycle*, small and medium loads are planned. There is a small amount of special training exercises aimed at developing different types of endurance: speed, strength, jumping. The development of speed, speed-power, coordination skills and flexibility is planned. Running work is represented by shuttle running 3x60 m, accelerations from 20 to 50 m, starts with a load of 4-6x20 m, interval running at a distance of 50 to 150 m, two or three series with intensity (80-85%). During the mesocycle, the amount of running work increases from 2000 m to 3000 m. Auxiliary physical training of sprinters is represented by a variety of jumping and strength exercises, as well as special barrier exercises. In addition to physical training, there is a variety of technical training: mastering the technique of special training exercises in sprinting and hurdles, long

jump. Regarding psychological training, special attention was paid to the formation of motivation of athletes to regular classes in the athletics club.

In the second *retracting mesocycle*, small amounts of aerobic endurance work are planned. Because the performance of large amounts of aerobic work by sprinters in the preparatory period has a negative impact on speed technique and the manifestation of speed abilities (V.M. Platonov, 1984). During the mesocycle there is a tendency to increase the volume of running work (acceleration from 30 to 60 m, starts with resistance 4x20 m, running at 6x20 s and 6x10 s, barrier running 30-60 m, interval running at a distance of 70 to 250 m with an intensity of 85-90%, etc.), aimed at the development of speed abilities and speed endurance.Thus, the volume of special running work of athletes increases from 2250 m to 3500 m. The volume of speed and strength work to strengthen the muscles of the legs and feet (various jumps, long jumps, jumping complexes, etc.) also increases. In addition, the amount of strength work with the barbell increases (12 kg): jumps, lunges, barbell bench press, etc.

In shock microcycles, athletes performed significant amounts of anaerobic running on Monday, so no running was planned for Wednesday, and strength work aimed at developing absolute strength, power and jump endurance is planned. Significant amounts of running work are scheduled for Friday again.

The basic mesocycle involves the development of speed and speed-power abilities, absolute strength, power, jumping and special speed endurance; improving the coordination structure of movements in the smooth and barrier running of athletes (technical training). Running work of athletes is beginning to acquire a special character. The amount of special running work of athletes increases from 2350 m to 3000 m, but it is smaller than in the previous mesocycle.

In the first two microcycles (retractable and shock), only on Monday, athletes perform significant amounts of special running work aimed at developing speed abilities and speed endurance. This work requires deep use of energy resources of the body and the recovery period can last up to several days. After such classes, there is a significant suppression of speed abilities, so on Wednesday, strength training is

planned in the gym for the development of absolute strength and endurance of athletes. On Friday, the athletes have a recovery exercise with a small load (basketball, massage).

In the third microcycle (shock) on Monday athletes perform a large load of speed and power direction (interval running 2 series 60 + 80 + 100 m with an intensity of 85-90%, jumping complex: 4x20 m jumps on the right leg and 4x20 m jumps on the left leg ; running 4x100 m with a tire). On Wednesday, the amount of load decreases and changes the direction of the load - the development of strength endurance in the gym. On Friday, athletes perform a load aimed at developing speed and general endurance (alternating running series of 1 minute (~ 400 m) and 2 minutes (~ 300 m) 2 repetitions of 2 series, cross 2500-3000 m.

In the fourth microcycle (recovery) the average and small size of loading is planned, the volume of training work in comparison with the shock microcycle is reduced, means of active rest are widely applied.

Thus, when compiling the training program of each microcycle, the impact on the body of young athletes of training with different size and direction of the load, as well as the duration of the recovery process after them was taken into account. The same opinion in the process of building microcycle programs is held by leading experts in the theory and methods of sport (L.P. Matveev, 1977; V.M. Platonov, 1987; V.M. Platonov, F.P. Suslov, 1995; Yu. M. Scrape, 1976 and others).

The competitive mesocycle begins in December. This mesocycle reduces the amount of strength work with weights (barbell, barbell, dumbbells, etc.), but increases the amount of speed and strength work with your own body weight (multi-jumps, deep jumps, one-legged jumps, etc.). The intensity of special running exercises reaches maximum values (90-96 %).There is a tendency to reduce the volume of special running work from 3100 to 2550 m. The technical improvement of the coordination structure of smooth and barrier running continues. Athletes continue to carry out a variety of technical training, mastering the technique of special training exercises in sprinting and hurdles, long jump. The tasks of general and special psychological training of athletes are solved.

In order to determine the effectiveness of the developed training process of athletes during the first macrocycle of the "dual" cycle of annual training, a comparative analysis of statistical indicators of physical fitness of athletes at the beginning and end of the macrocycle (Table 4).

There is a general tendency to improve the statistical indicators of physical fitness of athletes. Significant (P<0,05) increase in results was found in the 30 m run by 3,86 % (t=2,56), the 200 m run – by 5,07 % (t=4,62), the 300 m run. m – by 2,17 % (t=2,47) and long jumps from a place – by 7,57 % (t=3,93). The obtained data show that under the influence of the developed training program during the first macrocycle of training, there was a significant improvement in the indicators of speed abilities, speed endurance and explosive power.

Table 4

Comparison of indicators of physical fitness
athletes at the beginning and at the end of the macrocycle (n=10)

№	Tests	X±m		probability estimation	
		September	December	t	p
1	Running 30 m from the start, s	5,18±0,06	4,98±0,05	2,56	<0,05
2	Running 60 m from the start, s	9,73±0,07	9,50±0,09	2,09	>0,05
3	Running 100 m from the start, s	15,55±0,06	15,38±0,06	2,00	>0,05
4	Running 200 m from the start, s	33,89±0,19	32,17±0,32	4,62	<0,05
5	Running 300 m from the start, s	55,2±0,38	53,8±0,42	2,47	<0,05
6	Long jump from a place, s	186,2±2,33	200,3±2,73	3,93	<0,05

Insignificant (p>0,05) increase in the results of athletes was found in the 60 m run by 2,36 % (t=2,09) and in the 100 m run – by 1,09 % (t=2,00). The calculated value of the Student's t-test in these tests is not significantly lower than the critical value (t_{cr}=2,28).

The unreliable increase in results in the 60 m and 100 m runs from the start in athletes can be justified by research data from leading experts in the theory and methods of physical education and sports. Thus, these tests make it possible to assess the manifestation of speed in the integral motor action, which includes the speed of a simple motor reaction, the frequency of movements, the speed of single cyclic

movements, the rapid onset of movement.In turn, the speed of a simple motor response is little amenable to training, due to genotype (B.M. Shiyan, 2010). The frequency of movements has a significant annual increase in girls 11-12 years, and from 13 to 16 years the annual increase slows down (L.V. Volkov, 1998).

At the same time, we agree with the opinion of L.V. Volkov [3], who states that high rates of speed increase in holistic motor actions are observed in young athletes from 11-12 to 14-15 years. In the course of our research, purposeful high-speed training of athletes aged 13-14 was carried out only in basic and competitive mesocycles. The second macrocycle of the "double" annual cycle of training of athletes is longer and involves planning a larger amount of speed training, compared to the first macrocycle.

Conclusions / Discussion

1. It is determined that athletes at the stage of preliminary basic training use two-cycle planning of annual training ("double" cycle). In the structure of planning the training process during the first macrocycle training of athletes there are two periods: preparatory and winter competitive; three stages: general-preparatory, special-preparatory and competitive; four mesocycles: two retractable, basic and competitive. The main task of the first marocycle is defined - creation of the functional base for trainings during the year and participation in competitions of the winter competitive period.

2. The effectiveness of the program of the training process of athletes during the first macrocycle "dual" cycle of annual training is proved by the following criteria:

a) according to the sports achievements of the athletes during the participation in the main competitions of the macrocycle - the open Championship of Cherkasy region on track and field duel among boys and girls born in 2005-2006 According to the results of the competition, one athlete took the first place in the 60 m hurdles + 60 m, the second - the second place in the 60 m hurdles + 400 m, and the third - V place in the 60 m hurdles. Thus, out of ten athletes who participated in the experiment, one

athlete became the winner of the competition, one - the prize-winner, and the other took the fifth place;

b) on the basis of significant (P<0,05) improvement of statistical indicators of physical fitness (speed abilities, speed endurance and explosive power) of athletes during the experiment. Thus, the results in the 30 m run increased by 3,86% (t=2,56), in the 200 m run – by 5,07% (t=4,62), in the 300 m run – by 2,17% (t=2,47) and long jumps – 7,57% (t=3,93).

Prospects for further research. It is planned to develop a training program for sprinters 13-14 years old during the second macrocycle of the "double" cycle of annual training.

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