Construction of the annual macrocycle of short-distance runners at the stage of in-depth specialization

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Abstract

Objective of the study was to improving the sports training of sprinters aged 15-17 years based on the analysis of the dynamics of their training loads and the ratio of work of various directions in the annual cycle.

Methods and structure of the study. Variants of individual planning of year-round training were subjected to statistical analysis in 23 sprinters of the I sports category (n=18) and candidates for master of sports (n=5). The volume of fixed assets of training was fixed in specific units of measurement (kilometers, tons, number of times) and from the total annual volume, taken as 100%, the load dynamics by months of the annual training cycle was calculated as a percentage.

Results and conclusions. On the basis of statistical analysis, the issues of organizing the training load and the ratio of work of various predominant directions in the structure of the annual cycle of training for sprinters of a given level of sportsmanship are considered. The nature and dynamics of the distribution of training means for athletes by months of the annual macrocycle were determined. The data obtained indicate that the modulation of the load parameters in terms of magnitude and direction, as well as the content and nature, should not only correspond to the strategic goals of training in the macrocycle, but also be commensurate with the natural course of development of the athlete's motor function.

Keywords: *analysis, training, annual cycle, load distribution, sprinters, means, volume, intensity, organization.*

Introduction. The organization of the annual macrocycle is a kind of "road map" for the preparation of an athlete for the planned time cycle. This is due to the determinants that determine the effectiveness of its adaptation to the means and methods of influence characteristic of a given sport [1,4,7]. It should be emphasized that any approaches to optimizing the system of training athletes can be justified only if they are based on fundamental theoretical foundations. And the very individuality of athletes can be effectively expressed only within the framework of general provisions that characterize rational forms of building training [4,7,8].

The training process provides for both the predominant development of certain aspects of the athlete's preparedness, and their comprehensive improvement on individual structural formations of the annual cycle [3, 7]. At the same time, it is important to ensure the continuity of tasks in the choice of training influences, and the final expression of the degree of rationality of the management of the training process and an objective characteristic of its productivity will be the sports result shown by the athlete at the main start of the season [2, 4, 7].

Objective of the study was to improving the sports training of sprinters aged 15-17 years based on the analysis of the dynamics of their training loads and the ratio of work of various directions in the annual cycle.

Methods and structure of the study. Variants of individual planning of year-round training were subjected to statistical analysis in 23 sprinters of the I sports category (n=18) and candidates for master of sports (n=5). A group of basic training means was analyzed, which are used in the training process of sprinters and are widely represented in the spe-

cial literature [5]. First, the volume of fixed assets of training was recorded in specific units of measurement (kilometers, tons, number of times), and then, from the total annual volume, taken as 100%, the dynamics of training loads was calculated in percent by months of the annual training cycle. This made it possible to compare and compare both the training impacts expressed in different units of measurement and the training strategy of individual runners in a given season.

It should be emphasized that we did not study the individual characteristics of the training of each athlete separately, since we were interested in the general trend in the organization of the annual training cycle for runners of this skill level.

Results of the study and their discussion. The average values of the total annual volume of fixed assets of special training and statistical parameters that determine the variability of training effects in sprinters were revealed (see table).

Noteworthy is the large variability (25.8%) in relation to the volume of running with an intensity of 80-90% on segments of 100-300 m and weight training (22.2%). The least variable means of training for female runners in this sample is running on segments over 300 m with an intensity of 80% or less, including cross-country running. Obviously, the organization of training in the annual cycle and on its structural formations in terms of content and volume has an individual focus, but at the same time it should not contradict the fundamental laws of building the training process [2,4,7].

Based on the calculated indicators, the orientation of the distribution of the main means of training female runners by months of the annual macrocycle was revealed. The obtained research results (Fig. 1, 2) indicate that the training process in October-December and March-April is mainly focused on solving the problems of special strength training of female athletes. Thus, in November, much attention was paid to weight-bearing exercises (12.6±11.3%), and the volume of jumping exercises (various multi-jumps, jumps, jumps, etc.) amounted to 9.1±5.4% of the annual volume. In December, respectively, the monthly volume of speed-strength exercises amounted to 15.8±14.2 and 12.0±7.2%. This may indicate a certain concentration of the volume of means of special strength training at the basic stage of the annual macrocycle.

It is also important to note a certain delimitation in time of the maximum volumes of means of special strength and integral training (running at maximum speed) in female runners, which is typical for highly skilled female athletes [2]. At the same time, in October, athletes did not run at maximum speed (95-100%) and started running segments at maximum speed only in November, and the volume of such a run was only 3.8±0.4%. In December, the volume of running at maximum speed increased and reached 8.3±0.9% of the annual. The largest amount of running at maximum speed is observed in January, as well as in May, April and June.

At the same time, in the light of modern ideas about the construction of training [1,3,6], it is not recommended to simultaneously perform significant amounts of strength training and training effects associated with an increase in maximum running speed. In this case, a large power load can adversely affect the current level of speed-strength fitness, which does not contribute to the quality of the training process associated with the adaptation of the motor apparatus of athletes to cyclic locomotions of maximum power. If in the autumn-winter period, after special strength training, speed-oriented work follows, which makes it possible to optimally use the cumulative effect of power load, then in the second preparatory period, these two types of loads are performed almost in parallel.

Average values ($\bar{X}$), standard deviation (σ) and variability (V%) of the annual volumes of the main means of training sprinters aged 15-17

Means of special training	$\bar{x}$	σ	V%
Volume of running at a speed of 95-100% (segments up to 80 m), km	11,4	2,1	18,4
The volume of running at a speed of 91-100% (sections 100-300 m), km	10,3	1,7	16,5
The volume of running at a speed of 80-90% (sections of 100-300 m), km	25,5	6,6	25,8
The volume of running at a speed below 80% (sections over 300 m), km	70,6	5,3	7,5
Various jumping exercises, number of times	6000	1050	17,5
Various weight-bearing exercises, number of times	90	20	22,2

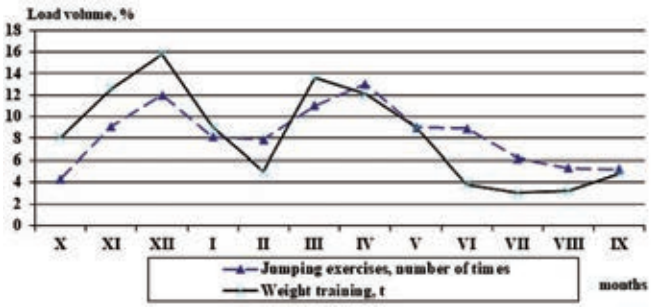

Figure 1. *Distribution of means of speed-strength orientation among sprinters in the annual cycle of training*

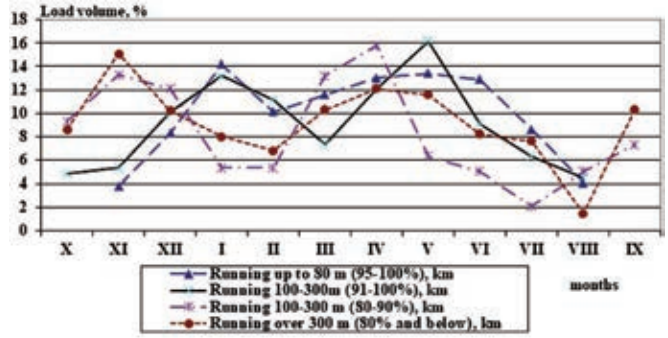

Figure 2. *Distribution of the main means of running training among female runners for short distances in the annual cycle of training*

In the process of special strength training, female athletes simultaneously use smooth running at low speed. So, in the first preparatory period (November), the load of a speed-strength nature coincides with the maximum (15.1±9.1%) of aerobic work (running on segments over 300 m with an intensity below 80%). As evidenced by special studies [6, 8], it is preferable to implement adaptation to training effects in the initial phase due to vegetative functions that prevail in the aerobic provision of muscle activity. The latter promotes an increase in the power of energy systems and acceleration of adaptive biochemical processes that occur during the anabolic phase of metabolism in the body [6]. In this regard, before the start of volumetric power loads (that is, in October), you should perform a maximum of aerobic running work.

In the second preparatory period (April and May), still significant amounts of running are recorded with an intensity below 80%. Such planning at this stage of the annual cycle is not entirely rational, since at this time the emphasis should be on training effects of a mixed aerobic-anaerobic orientation (running in segments of 100-300 meters with an intensity of 91-100%).

The largest monthly volume of running on segments of 100-300 m with an intensity of 91-100% is performed in the first preparatory period in December and January, in the second - in April and May. During the transitional period, which for athletes of this qualification falls in mid-June and August, all the main means of training are performed in a supportive mode, as evidenced by a significant reduction in the volume of training impact parameters.

Conclusions. The analysis of the given factual material of the organization of the training process by sprinters of the corresponding qualification showed that the athletes have a rather large variability in the volume of the main means of training, both by months of the annual cycle, and by the total volume for the year. In part, this fact can be explained by the lack of objective data on the required parameters of the main means of training female runners at the stage of in-depth specialization.

The organization of training in sprinting determines the necessity of constant clarification of the content and distribution of means of a speed-strength nature in the macrocycle, since due to the short duration of the support time in sprinting, it is not so much the increase in the level of absolute strength that becomes important, but local, “targeted”, working out the muscles [1, 3, 11, 12] involved in cyclic locomotion of maximum power. The correct selection of speed-strength exercises, taking into account the operating modes of the musculoskeletal system in the structure of the movement system during high-speed running, can largely initiate a further increase in sports results.

To increase the level of special strength training in sprinting, “long” jumping exercises should be used to a greater extent. It should be noted that highly skilled sprinters perform about 20 km of such jumps per year. Jumping from foot to foot in segments of 30-60 m with the control of time and number of steps gives the greatest effect [2]. The results in these tests can also serve as informative indicators for assessing the preparedness of female athletes and adjusting the course of their training process.

It is very important that the modulation of the load parameters in terms of magnitude and direction, as well as the content and nature, correspond not only to the strategic goals of training in the annual cycle, be in proportion with the natural course of development of the athlete’s motor function, but, at the same time, be adequate to the current state of her body. at the time of the training session. In this case, it is necessary to take into account the individual characteristics of a

particular athlete and rely more on her leading motor abilities.

Such an organization of the training process, based on the constant consideration of the characteristics of each athlete, is the most justified at the stage of in-depth specialization [9,10], setting targets for building their training at the next stage of long-term improvement.

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