

PECULIARITIES OF THE CONTENT
AND ORGANIZATION OF THE
STRENGTH TRAINING OF YOUNG
MIDDLE DISTANCE RUNNERS
IN THE ANNUAL CYCLE



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Аннотация

Эффективность подготовки бегунов на средние дистанции чаще всего связывалась с совершенствованием кислородно-транспортной функции. Дееспособности мышечной системы отводилась не менее значимая роль, т.к. сократительные и окислительные свойства мышц, во многом, детерминируют двигательные возможности. В контексте существующей парадигмы резерв для роста их спортивного мастерства исчерпан. В связи с этим наметился тренд на применение средств из арсенала силовой подготовки. Однако их значимость не подвергается сомнению лишь в отношении бегунов высокой квалификации.

Ключевые слова: бег на средние дистанции, средства, методы, годичный цикл, силовая подготовка.

Анотація

Наявність суперечливих думок про роль впливів силового характеру в підготовці бігунів на середні дистанції викликає інтерес до проблеми доцільності їх використання і на ранніх етапах багаторічної підготовки. Прагнення фахівців вивести вплив даної групи з «тіні» дистанційних засобів підготовки збереглося, проте дану точку зору готові підтримати не всі. У статті представлені дані дослідження ефективності силової підготовки бігунів на середні дистанції. Виявлено, що в їх підготовці застосування засобів силового характеру допустимо, що спектр їх застосування широкий, що підвищення спортивної майстерності супроводжується збільшенням навантажень в групі засобів даної спрямованості. Встановлено некоректна інтерпретація даних наукових досліджень, що видається за протиріччя між досягненнями науки і практики спорту.

Ключові слова: біг на середні дистанції, тренувальні навантаження, силова підготовка, етап початкової спортивної спеціалізації

Formulation of the problem and analysis of the latest publications. It was considered for a long time that the effectiveness of middle distance runners preparation at medium distances is associated exclusively with the improvement of the mechanism of functioning of the oxygen transportation system [1, 2, 3, etc.]. Data from recent studies suggest that the ability of the muscular system of middle distance runners plays an equally significant role in the development of their sportsmanship. Many authors agree that the contractile and oxidative properties of the muscles of a runner can largely determine his/her motor abilities, while the rest of the physiological systems of the body functionally support and provide the required level of muscular activity [1, 2, 4, 5, etc.].

Interest in this approach in the preparation of middle distance runners has arisen because of the fact that it became obvious that the reserves of the «extensive way» for improving their preparedness have become exhausted, which is mainly due to the inability to timely replenish energy and plastic resources. Therefore, experts agree that the way to the further improvement of sports results is due to the introduc-



tion of more specific means of influence in the preparation. Among the latter, experts attribute the impact from the arsenal of means of strength training, since from their point of view the purposeful application of means of accentuated influence on the neuromuscular apparatus contributes to an increase in the athletic result [1, 5, 6, 7].

However, the high importance of strength training for middle distance runners is not questioned only for athletes of high qualification. The expediency of their application in the training of young runners for a long time caused fundamental differences in the experts' circle [3, 7, etc.].

The purpose of the study was to identify the specific content of strength training for young middle distance runners and the options for its organization in a one-year cycle.

Methods and organization of research. In the survey, specialists ($n = 21$) were interviewed on the content of strength training and the forms of its organization in a one-year cycle of training middle distance runners aged from 13 to 15 years. Respondents were provided with a list of power tools ($n = 29$) as the most demanded for this section. As a measure of demand, the concordance coefficient parameter (W) was used. In the context of the problem under study, the features of using the methods most often recommended for strength training of young middle distance runners were investigated [2, 7, 8]. As respondents, the survey involved coaches, of which 52.4% are of the highest category. The survey was conducted in February-March 2009. In order to identify the organization of force loads in the annual cycle of training of the group of runners, a survey was conducted. Experts ($n = 21$) were invited to present their own version of their organization in a one-year cycle and to assess on a four-point scale, depending on the value (in accordance with the existing classification) [4, 5]. Organiza-

tion of loads of this orientation in the annual cycle was determined by the dynamics of the values of the total and partial parameters. The degree of their variation was determined by the value of the coefficient of variation (V_c). The procedure provided for calculation of the confidence interval with a probability of 95%, with a significance level $P < 0.05$ of the average value of the total load parameter. This range was used in differentiation of the forms of organization as a reference point. If the load parameter during a year varied within the confidence interval, this option was identified as a steady one, otherwise variable. Consistency of experts' opinions ($n = 21$) with respect to the dynamics of loads was determined from the value of W .

Results of the study and their discussion. For a long time it was believed that the effectiveness of preparation of middle distance runners is associated with the improvement of the functions of the oxygen transport system. Later it was established that the muscle components play an equally important role in the realization of the motor potential of athletes in conditions of competitive activity. Currently, experts argue that the targeted impact on these components contributes to a more significant increase in runners' level of their specific efficiency than when using remote training means [1, 2, 5, etc.].

Unfortunately, this point of view has not found adequate reflection in methodological developments. It is believed that the use of power tools in the preparation of young middle distance runners has a negative effect on the condition of their musculoskeletal system, on the one hand, and on the other, has only an indirect effect on the growth of athletic achievements in this form of track and field athletics. Therefore, their use is not advisable [3, 6, etc.].

Despite the declared unpopularity of using exercises in this area in the training of young runners, they are quite widely represented in the

arsenal of tools used. It is established that 100.0% of respondents use means of power character in training young middle distance runners. It has been revealed that preference is given to the means aimed at developing strength and speed-strength forms of motor manifestation of endurance (51.8%), as well as speed-strength abilities (27.6%), developed with emphasis on the speed component. To a lesser extent, the actual speed-strength exercises are used, which are used to increase the strength component of the movement (10.3% each). The obtained data suggest that the development of strength capabilities was carried out mainly in the mixed (44.8%) and alactate (37.4%) energy supply zones. The «poorest» of all is represented the arsenal of means used in the aerobic energy supply zone (2.6%). There is also a tendency to reduce to a minimum the development of tools in the glycolytic energy supply zone (15.2%) ($W = 0.796-0.902$).

The analysis of the content of strength training presupposed the study of methods that predetermine the predominant direction, the effects used for this purpose. To this end, the experts were offered a list of methods recommended for use in the implementation of the tasks of strength training. According to the analysis results, the most popular among trainers in strength training is the re-serial method (43.3%), and the striking method (5.3%) is the least. The remaining methods vary in the range 10.8 - 14.2% ($W = 0.810 - 0.865$). Depending on the need to develop some form of motor manifestation of their strength, their demand is changing. It should also be noted that respondents are not inclined to use conjugate and variational methods (Figure 1).

According to the data of the analysis of power loads, changes of their parameters in a year cycle reflect presence of the certain similarity in the approaches to the form of their organization. Dynamics of



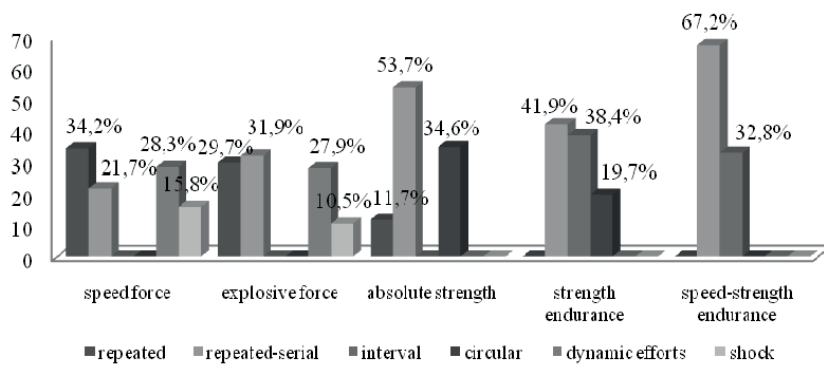


Fig. 1. The ratio of training methods used to develop various forms of motor manifestation of power abilities in middle distance runners, aged 13-15 years, %

power loads in the annual cycle of preparation has an ordered nature of their construction, expressed in a clear alternation of periods, where their values reach their maximum and minimum. There are two such

periods in the annual cycle, and they are logically justified, because coincide with the periods of the main competitions of the season (I-II and V-VI months), the increasing of motor capacity by the runners, tak-

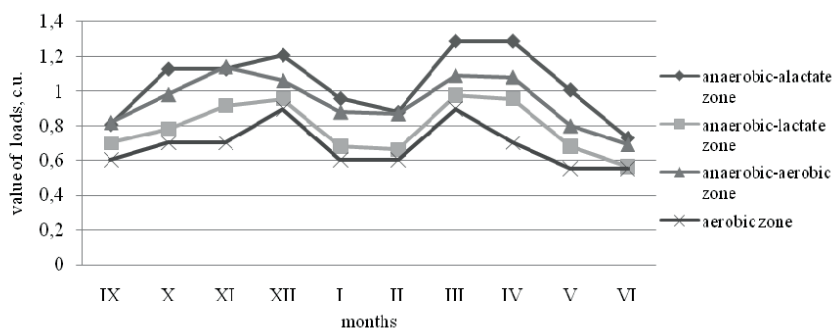


Fig. 2. Steady variant of distribution of power loads in the annual cycle of preparing middle distance runners aged 13-15 years (by zones of energy supply), c.u..

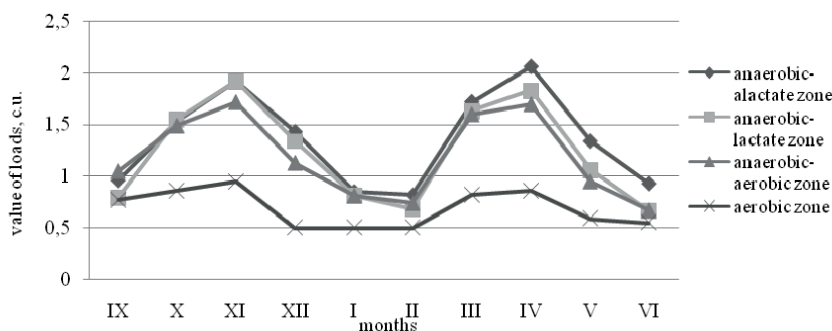


Fig. 3. Variational variant of distribution of power loads in the annual cycle of preparing middle distance runners aged 13-15 years (by zones of energy supply), c.u..

ing into account the time required for restoration (XI-XII and III-IV months). Differences occur only in the magnitude of the variation in the loads and the nature of their concentration over time.

Thus, in a steady variant some priorities in use of loads of various zones of power supply can be seen. In a simplified form, the ranking can be carried out on the basis of the principle of their decreasing dominance. In a variational variant such situation was not revealed. The only exception is the aerobic loads which are developed in a much smaller volume than the rest. Among the reasons for the «negligent» attitude to the loads of this orientation in the means of strength training, one can attribute their dominance in the means of running training.

The dynamics of influences in the means of strength training of alactate orientation is also tied to changes in the parameters of loads of the same orientation in means of running nature. Perfection of the mechanism of alactate energy supply of runners in the annual cycle is carried out by successive dominance of loads of this orientation, first in means from the arsenal of running, and then power training. In the case of glycolytic loads, the same tendency is observed, but «exactly to the contrary». Loads in the mixed energy supply zone are mastered within the framework of parallel use of the means of running and power training. One can also note a more «concentrated» nature of the concentration in the annual cycle of power loads in the variational variant (Figures 2-3).

The obtained data indicate that in both analyzed variants, the actual strength loads in the I-II and V-VI months are used in the minimum volume, and at the maximum in the XI and III months (Figures 4-5). The dynamics of this parameter in the variational «version» is more expressed than in the steady version. The nature of the distribution of loads in the means of speed-



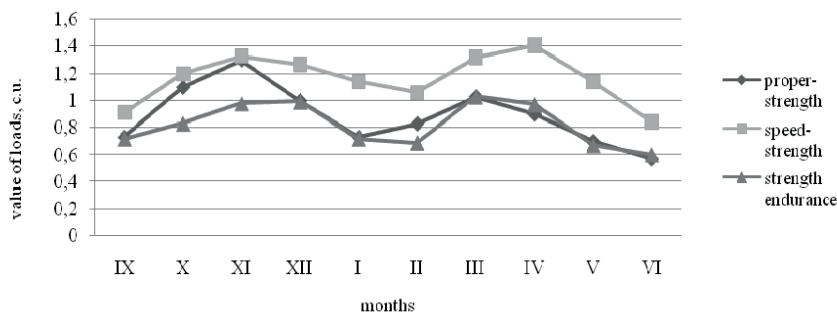


Fig. 4. Steady distribution of strength loads in the annual cycle of training middle distance runners aged 13-15 years (by the primary direction),c.u.

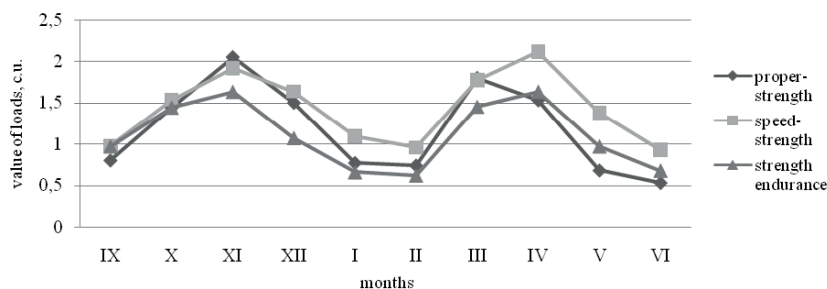


Fig. 5. Variational distribution of strength loads in the annual cycle of training middle distance runners aged 13-15 years (by the primary direction),c.u..

strength directivity in both versions has a sign of a certain similarity.

Thus, in the analyzed variants, the largest volumes of loads of this group of means are mastered in the second macrocycle. Peaks also coincide with their maximum (XI and IV months) and minimum values (II and VI months). In the second macrocycle, the maximum values in this load parameter are achieved one month later (IV month) than in the parameter of the effects of the actual strength character. Dynamics of the loads, mastered by young runners in the regime of power endurance, is close in nature to their construction in the group of speed-strength means. The difference is observed in the magnitude of the variation of the parameter and in the period when they reach their maximum. The low value of the volume of loads of power directivity, developed in

the endurance regime, is apparently compensated by their high volumes in means of running character [3, 8].

Conclusions. The results of the study suggest that 100.0% of coaches use strength training in the training of middle distance runners aged 13-15 years. It is mainly aimed at improving: strength and speed-strength endurance (51.8%); speed-strength abilities (27.6%), developed with an emphasis on the speed component. The means used in the mixed (44.8%) and alacatate (37.4%) energy supply zones dominate. To a lesser extent, actual strength exercises and speed-strength exercises (10.3%) are used, stimulating the growth of the force component of motion ($W = 0.796-0.902$). In strength training, the most frequently used is the re-serial method (43.3%), and least often (5.3%) striking method ($W =$

0.810 - 0.865). In strength training, two variants of its organization are used in the annual cycle: variable and steady. In the dynamics of loads, the periods in which they reach the «extreme» values ($W_{min} = 0.806 - 0.852$, $W_{max} = 0.735 - 0.789$) are revealed. These are the periods of an accentuated increase in the runners' motor potential and its realization in competitions. Differences are only in the magnitude of the variation of loads and the nature of their concentration in time.

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