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THE USE OF VARIOUS GAMES AND GAME EXERCISES IN THE TRAINING OF YOUNG SHORT-DISTANCE RUNNERS[1]

A method of training young runners (12-15 years old) for short distances in a one-year training cycle using various games and game exercises has been developed.
Using an instrumental technique, tensodynamograms of the strength characteristics of those muscle groups involved in leg extension at the knee and hip joints were obtained. To assess the strength and speed-strength characteristics of the muscles of the lower extremities in young men, absolute strength was determined (the manifestation of isometric tension of the muscle group was recorded without taking into account time), the "explosive" muscle contraction in the isometric mode (force gradient) was estimated, and the value of strength indicators that young sprinters can develop in 0.1 s was calculated.
It has been revealed that the use of the developed methodology for training young short-distance runners in an annual cycle contributes to a statistically significant increase in the analyzed indicators and an increase in athletic performance.

Keywords*: young sprinters, one-year cycle, speed and strength indicators, strain kinamography, extension of the leg in the knee and hip joints.*

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ИСПОЛЬЗОВАНИЕ РАЗЛИЧНЫХ ИГР И ИГРОВЫХ УПРАЖНЕНИЙ В ПОДГОТОВКЕ ЮНЫХ БЕГУНОВ НА КОРОТКИЕ ДИСТАНЦИИ

Разработана методика подготовки юных бегунов (12-15 лет) на короткие дистанции в годичном цикле тренировки с использованием различных игр и игровых упражнений.
С помощью инструментальной методики были получены тензодинамограммы силовых характеристик тех групп мышц, которые участвуют в разгибании ноги в коленном и тазобедренном суставах. Для оценки силовых и скоростно-силовых характеристик мышц нижних конечностей у юношей определялась абсолютная сила (фиксировалось проявление изометрического напряжения мышечной группы без учета времени), оценивалось «взрывное» сокращение мышц в изометрическом режиме (градиент силы), а также рассчитывалось то значение силовых показателей, которые юные спринтеры могут развить за 0,1 с.
Выявлено, что использование разработанной методики подготовки юных бегунов на короткие дистанции в годичном цикле способствует статистически достоверному приросту анализируемых показателей и росту спортивного результата.

Ключевые слова: *юные спринтеры, годичный цикл, скоростно-силовые показатели, тензодинамография, разгибание ноги в коленном и тазобедренном суставах.*

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Relevance. Currently, a large amount of methodological material has been accumulated on the use of various speed and strength exercises in the training of runners [1, 3, 5]. However, the problem of choosing rational means of speed and strength training, the specifics of their use in training with a different contingent of sprinters, has not received a satisfactory justification and theoretical explanation.

In most cases, recommendations regarding the systematic use of speed and strength training tools are developed for qualified athletes [1, 5]. However, the foundation of higher skill is laid at the initial stages of training. And how the training of novice athletes will be rationally organized in various structural units of the annual training cycle is of paramount importance. In addition, the methodological provisions prepared for qualified athletes very often, without proper understanding, apply to the educational and training process of young athletes.

An analysis of the specialized literature has shown that special strength training facilities occupy an important place in the system of sports training for sprinters of various ages, and issues related to speed and strength training for young sprinters have clearly not been sufficiently considered [3, 4]. This is due to the fact that these tools, firstly, are designed to ensure the formation of such a structure of an athlete's physical fitness that would meet the specifics of the external relations of his body, and, secondly, should correspond in their effect to the athlete's activity regime in a specialized exercise.

The purpose of the study was to determine the effectiveness of the training methodology for young short-distance runners in a one-year macrocycle using outdoor, sports games and game exercises.

Methodology and organization of research. For an instrumental assessment of the strength and speed-strength capabilities of the muscles of short-distance runners, the method of computer tensodynamography was used, which made it possible to record the strength-time curve, as well as observe the rate of increase in muscle strength [2, 4]. The absolute force recorded during the manifestation of isometric tension of a group of muscles without time fixation was determined, the "explosive" muscle contraction in the isometric mode was estimated - the force gradient (the ratio of the maximum manifested muscle effort to the time of its achievement) and those values of strength indicators that sprinters can develop in 0.1 s. The recording and processing of the obtained strain-strain diagrams of the strength characteristics of those groups of muscles that are involved in the extension of the leg in the knee and hip joints.

The results of the study and their discussion. Based on a broad generalization of advanced pedagogical experience, a questionnaire survey of coaches, and an analysis of documentary material (training diaries), the structure of the annual cycle of 12-15-year-old short-distance runners at the stage of initial specialization was determined.

When developing this scheme, the main attention was paid to the problem of optimal planning of training for young athletes, which provided for such an organization of training that would exclude "forcing" training. Based on the obtained factual material, the following directions were identified in the organization of special physical training for young runners, designed to reduce the likelihood of forced training of those involved.

1. It was planned to slightly increase (by 10-15%) the amount of general physical training funds from the training loads of qualified sprinters. At the same time, exercises were widely used, which are used to a small extent by adult sprinters of higher qualifications. Thus, the predominant introduction into the educational and training process of young sprinters of outdoor, sports games, game exercises, etc.

2. The total fulfillment of the annual workload related to the means of special physical training is calculated. The volume of the latter was no more than 40-50% of the similar training effects of more qualified sprinters.

3. Organization of the load according to monthly cycles, maximum values of the use of training equipment are provided for no more than 10% per mesocycle of the annual volume of training activities. In adult athletes, these load parameters provide for the concentration of unidirectional means of special physical training up to 20% or more per month of the annual volume [1].

Based on the above material, a methodology has been developed for developing special fitness by using game training tools for young sprinter runners aged 12-15 years. Track and field sprinters trained according to the developed schemes of the complex organization of the training process of athletes of the first (12-13 years old, n=21) and the second (14-15 years old, n=18) experimental groups.

In the first experimental group, boys aged 12-13 years old, as a result of one-year training, along with an increase in the result in the 100 m

run by 1.43 seconds, significantly improved the indicators of special physical fitness: the running time of 20 m on the move and 60 m from the start improved, respectively, by an average of 0.19 s and 1.02 s; the results in the long jump improved. 0.40 m in length from a standing position, 1.02 m in triple jump from a standing position and 1.12 m in two–handed bottom-forward (3 kg) shot throw.

In particular, the differences in the performance of the 60 m run from the start, the triple jump, and the two–handed bottom-to-front shot have high statistical significance ($p<0.05$). There is also a significant, statistically significant ($p<0.01$) increase in strength characteristics – absolute strength, force gradient and force manifestation in 0.1 s.

In the second experimental group, the cumulative effect of one-year training in boys aged 14-15 was expressed in an improvement in performance in the 100 m run by 1.13 s, in the 20 m running and 60 m running, respectively, by an average of 0.17 s and 0.22 s, in the long jump from a standing position by 0.30 m, in the triple in the standing jump – by 0.84 m, in the two–handed shot throw from below - forward (3 kg) by 1.65 m. Statistically significantly, strength indicators increased for 1% of the significance level. Thus, the absolute force increased by 10.83 kg, the force gradient by 159.18 kg/s, and the manifestation of force in 0.1 seconds by 13.59 kg.

Conclusion. Outdoor games and game exercises have the greatest effect in terms of the interest of those involved in performing training work and ensuring high motor activity. The popularity of such games among the children's population is primarily due to the fact that they are close to the mental makeup of the child and are easier to perform in sports training. During any game, the following parameters must be recorded: the sum of the pulse rate for 5 minutes of the game, the highest heart rate during the game, the ratio of running and walking during the game, the level of fatigue of children, the interest of those involved in the game (the desire to continue the game).

Testing conducted at the beginning and at the end of the one–year pedagogical experiment showed a significant increase in the analyzed indicators among athletes of the experimental groups, which was reflected in the result of running at the main sprint distance - 100 m. The increase in strength indicators among young sprinters can be explained not only by the sensitive period of muscle strength development, but also by the effectiveness of training activities.

The results of the pedagogical experiment allow us to testify to the productivity of the speed and strength training methodology in an annual cycle, developed for short-distance runners aged 12-15 years, as well as the content of normative indicators assessing their fitness.

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