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EFFECTIVE METHODS FOR DEVELOPING ENDURANCE IN CHILDREN AGED 10–12 WHO PARTICIPATE IN ATHLETICS

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Annotation: This article scientifically examines effective methods for developing endurance in children aged 10–12 who participate in athletics. The study analyzes the age-related and individual characteristics of young athletes, their levels of physical fitness, and the effectiveness of training tools and methods aimed at improving general endurance. Particular attention is paid to the purposeful use of running exercises, active games, general developmental exercises, and specialized training exercises, as well as to determining the volume and intensity of physical workloads in accordance with the functional capacities of young athletes.

The study substantiates the potential for improving the physical fitness of young track and field athletes through the gradual development of general endurance, the rational distribution of training loads, and the application of pedagogical monitoring methods. The findings are expected to contribute to improving the effectiveness of training sessions aimed at developing general endurance in children aged 10–12 and to the scientific and methodological enhancement of the training process.

Keywords: 10–12-year-old athletes, track and field athletics, general endurance, endurance development, physical fitness, sports training, age-related characteristics, running exercises, physical workload, training process, pedagogical monitoring, active games, training sessions.

Endurance plays a particularly important role in the physical development of a growing organism. It is an essential physical fitness component that reflects an individual's ability to perform a specific physical activity effectively over an extended period, resist the onset of fatigue, and maintain working capacity. General endurance is characterized by the body's ability to mobilize and demonstrate its functional capacities during relatively prolonged physical activity involving various muscle groups. Developing this quality from childhood through scientifically substantiated training methods and appropriate physical exercise not only contributes to improved athletic performance but also has a positive impact on children's overall physical development, motor activity, and adoption of a healthy lifestyle.

Track and field athletics is one of the sports that offers extensive opportunities for developing general endurance. Its constituent disciplines, including race walking, running, jumping, and throwing, are based on fundamental human motor activities and contribute to the development of various functional systems of the body. In particular, the rational application of regulated running exercises, variable-pace running, short-duration repeated running, relay races, and active games constitutes an effective means of developing general endurance in young athletes.

The age range of 10–12 years represents a significant stage in children's natural growth and development, the expansion of their motor capabilities, and the formation of physical fitness components. During this period, functional changes associated with the development of the cardiovascular, respiratory, and neuromuscular systems become increasingly evident. Therefore,

the development of endurance requires the duration of exercises, number of repetitions, pace of execution, recovery intervals, and overall training load to be appropriately adjusted to each child's biological maturity and functional capacity. In this regard, rather than prescribing an identical workload for all children, it is essential to consider their individual physical capabilities, health status, and current level of physical preparedness..

In the Republic of Uzbekistan, a number of normative and legal acts have been adopted to promote the development of physical education and sports, encourage the widespread participation of young people in sports activities, foster a healthy lifestyle, and improve the system of mass sports. In particular, Presidential Decree No. PF-6099, dated 30 October 2020, entitled “On Measures for the Widespread Implementation of a Healthy Lifestyle and the Further Development of Mass Sports,” established an important organizational and legal framework for increasing physical activity among the population and promoting mass sports. The decree places particular emphasis on the development of walking, running, and other mass sports, as well as on expanding opportunities for regular physical activity in people's everyday lives.

One of the major challenges encountered in practical training is the insufficient diversity of training methods used to develop endurance, the inadequate consideration of individual characteristics when determining the duration and intensity of running exercises, and the lack of a sufficiently systematized set of criteria for evaluating training effectiveness. Such shortcomings may affect young athletes’ adaptation to training loads, the improvement of their physical fitness indicators, and their motivation to participate in sports activities.

Therefore, the development of general endurance in 10–12-year-old track and field athletes requires an integrated approach involving continuous running, variable-pace running, alternating running and walking, relay exercises, active games, and general developmental exercises. Applying these training methods in the preparatory, main, and concluding phases of each session in accordance with clearly defined pedagogical objectives, progressively increasing training loads, and systematically monitoring athletes’ functional condition are essential prerequisites for ensuring the effectiveness of the training process.

Middle-distance (800–1500 m) and long-distance (3000 m and above) running events require athletes to demonstrate a high level of aerobic capacity, anaerobic endurance, technical running efficiency, and disciplined adherence to structured training regimes. In contemporary sport practice, the management of the training process is increasingly based on the integration of digital technologies, biometric monitoring systems, big data analytics, and real-time training load control. Such an approach allows for a comprehensive analysis of individual athlete characteristics, precise regulation of training stimuli, and the development of optimized, individualized workload models aimed at maximizing athletic performance.

Physical education and sports are important factors in strengthening human health and developing the functional capabilities of the body. In particular, long-distance running in athletics requires a high level of endurance from the athlete’s body. Endurance is the athlete’s ability to withstand prolonged physical exertion, perform exercises without stopping, and resist fatigue. In long-distance running, endurance directly influences sports performance. Therefore, studying, shaping, and developing the athlete’s endurance level holds special significance in sports physiology, pedagogy, and theory.

Special endurance — specific to a particular sport. For example, in long-distance running, it includes maintaining running speed for a long time, avoiding a decrease in speed in the final stages, and properly distributing energy expenditure.

It has been emphasized that the special endurance of middle- and long-distance runners largely depends on the body's ability to maintain a balance between oxygen demand and its consumption over a prolonged period. During long and ultra-long distance running, it is important that oxygen consumption, heart rate, and minute blood volume remain at a consistent level for an extended time. Despite this relative stability, fatigue gradually increases, and the athlete completes the distance with pronounced signs of exhaustion.

There are many reasons for this, but one of the main causes is the temporary weakening of the activity of the central nervous system tissues in the brain, which regulate running. Naturally, if an athlete starts running at a pace beyond their capacity, fatigue occurs more quickly, forcing them to slow down or stop. In this situation, the oxygen demand exceeds expected consumption. Not only the muscles, but also the brain tissues fail to receive sufficient oxygen. As a result, the athlete's work capacity decreases, and the intended performance outcome is not achieved.

Today, when planning sports training, it is necessary not only to consider the preparatory components but also to develop new training programs aimed at ensuring athletes are thoroughly prepared for major competitions, such as world championships and cup events.

Achieving high results in long-distance running in athletics depends largely on the athlete's technical and tactical skills, which is self-evident. However, the distribution of the main training loads for athletes in these sports is directly related to their functional state. It is determined by the cardiovascular system, respiratory organs, lung vital capacity, and physiological capabilities. The speed and performance in long-distance running are not only based on technical and tactical mastery but, importantly, also on the athlete's functional readiness. Therefore, it is essential to consider the physiological value of training loads and functional capabilities when planning and distributing the training process.

The aim of the study is to improve the methodology for developing general endurance in 10–12-year-old children engaged in track and field athletics, to identify effective training methods and means based on young athletes' age-related and individual characteristics, and to develop scientifically substantiated methodological recommendations for their implementation in the training process.

Research Methods. The study was aimed at improving the methodology for developing general endurance in 10–12-year-old children engaged in track and field athletics. During the research process, the physical fitness of young athletes participating in athletics clubs organized at general secondary schools, the content and structure of their training sessions, the system of exercises employed, and the effectiveness of physical training loads were examined. Particular attention was focused on identifying the pedagogical, physiological, and organizational factors influencing the development of general endurance.

The methodological framework of the study was based on scientific approaches concerning the general principles governing the development of physical fitness components, the fundamental principles of sports training organization, the consideration of the anatomical and physiological characteristics of young athletes, and the gradual progression of physical training loads.

The following scientific and pedagogical research methods were employed during the study:

- Analysis and synthesis of scientific and methodological literature;

- Pedagogical observation;
- Pedagogical testing;
- Pedagogical experiment;
- Monitoring of the functional state of the cardiovascular system;
- Mathematical and statistical analysis.

Research Results. In the course of the study aimed at improving the methodology for developing general endurance in 10–12-year-old children engaged in track and field athletics, the organization of training sessions conducted in athletics clubs at general secondary schools, the system of exercises employed, the planning of physical training loads, and the physical fitness indicators of young athletes were examined. The pedagogical observations revealed a number of organizational and methodological shortcomings that may influence the effectiveness of training activities aimed at developing general endurance.

In particular, insufficient attention was observed in the planning of training loads to the age-related and individual characteristics of young athletes, their initial level of physical fitness, and their functional capacities. In some training sessions, the sequence of running exercises and other physical training activities was not consistently determined in accordance with clearly defined pedagogical objectives. Furthermore, the regularity and continuity of exercises specifically designed to develop general endurance were not adequately ensured. These circumstances indicate the need to improve the methodological organization of endurance training by taking into account the developmental characteristics and physical capabilities of children aged 10–12.

The analysis of the training process also highlighted the importance of selecting exercise methods according to the specific objectives of each training session. In particular, continuous running at a moderate and individually appropriate pace provides opportunities to develop aerobic endurance and improve the body's ability to sustain prolonged physical activity. Variable-pace running, in turn, enables young athletes to adapt to changes in movement intensity while maintaining the continuity of physical activity. The alternating use of running and walking is also an appropriate methodological approach for regulating exercise intensity and recovery, particularly among children with different levels of physical preparedness.

Another important finding concerned the potential of relay exercises and active games in developing general endurance. These activities combine repeated locomotor movements with elements of competition, coordination, and cooperation, thereby creating favorable conditions for maintaining children's interest and motivation during training. Their application can make endurance-oriented sessions more engaging while providing opportunities to develop motor activity through varied forms of exercise. However, the duration, intensity, and frequency of such activities should be adjusted to the individual capabilities of participants.

The study also emphasized the importance of combining general developmental exercises with specialized running activities. General developmental exercises performed during the preparatory phase of a training session help prepare the major muscle groups and functional systems for subsequent physical activity. The main phase should include endurance-oriented exercises selected according to the training objective and the athletes' level of preparedness. The concluding phase should focus on gradually reducing exercise intensity and supporting recovery through low-intensity walking and appropriate breathing exercises.

Particular importance was attached to the systematic monitoring of young athletes' functional condition during the training process. Monitoring indicators such as heart rate before and after exercise, the rate of heart rate recovery, the ability to maintain a prescribed running pace, and the athletes' subjective responses to physical exertion can provide useful information for adjusting training loads. In addition, pedagogical testing, including the six-minute running test, can be used to assess changes in general endurance, provided that testing conditions and procedures remain consistent.

Based on the methodological analysis, the development of general endurance in 10–12-year-old track and field athletes can be organized around the following interrelated training areas:

1. **Continuous running at a moderate pace.** This method is intended to develop the ability to maintain prolonged physical activity and improve aerobic endurance. The duration and pace of running should be determined according to the athlete's individual preparedness and functional capacity.
2. **Variable-pace running.** Alternating periods of relatively faster and slower running helps young athletes adapt to changes in exercise intensity and develop the ability to regulate their pace during prolonged physical activity.
3. **Alternating running and walking.** This approach makes it possible to regulate the overall intensity of training, introduce appropriate recovery intervals, and gradually increase the duration of continuous physical activity.
4. **Relay exercises and active games.** These methods combine endurance-oriented physical activity with competitive and motivational elements. They help maintain children's engagement and provide varied opportunities for repeated locomotor activity.
5. **Combination of general developmental and specialized exercises.** The integrated application of these exercises contributes to the comprehensive physical preparation of young athletes and creates the necessary conditions for performing endurance-oriented activities.
6. **Individual regulation and pedagogical monitoring of training loads.** The selection of exercise duration, intensity, repetition frequency, and recovery intervals should be based on the athlete's age, health status, initial fitness level, and response to physical exertion.

In conclusion, The analysis of scientific and methodological literature, together with the examination of the organization and content of training sessions, demonstrates that the development of general endurance in children aged 10–12 who participate in track and field athletics requires a scientifically substantiated, systematic, and individually differentiated approach. At this age, the development of endurance should be based on children's age-related anatomical, physiological, and functional characteristics, as well as their initial level of physical fitness and individual adaptation capacities.

The findings indicate that the effectiveness of endurance development largely depends on the appropriate selection and purposeful combination of training methods. In particular, continuous running at a moderate pace, variable-pace running, alternating running and walking, relay exercises, active games, and general developmental exercises constitute important components of the training process. Their systematic application creates favorable conditions for improving aerobic endurance, increasing tolerance to prolonged physical activity, and developing the functional capacity of young athletes.

It was also established that the planning and regulation of physical training loads play a significant role in the methodological organization of endurance training. The duration, intensity, frequency, and recovery intervals of exercises should be adjusted in accordance with the age-related and individual characteristics of each athlete. The gradual progression of training loads, the appropriate alternation of physical activity and recovery, and the avoidance of excessive exertion are essential conditions for maintaining the continuity and effectiveness of the training process.

Furthermore, the integration of endurance-oriented exercises into the preparatory, main, and concluding phases of training sessions makes it possible to establish a coherent pedagogical structure. The use of continuous and variable-pace running in combination with relay exercises and active games can also contribute to maintaining children's motivation and interest in systematic sports participation.

An important methodological conclusion is that pedagogical monitoring should be an integral component of the development of general endurance. Regular assessment of running performance, heart rate responses, recovery characteristics, and changes in physical fitness provides an objective basis for evaluating training outcomes and making appropriate adjustments to exercise loads.

In general, the development of general endurance in 10–12-year-old track and field athletes should be regarded as a continuous pedagogical process that combines scientifically selected training methods, individualized load regulation, age-appropriate exercise organization, and systematic monitoring. The implementation of these methodological principles provides a scientific and practical basis for improving the quality of young athletes' physical preparation, supporting their functional development, and establishing the prerequisites for further improvement of sports performance.

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