TRAINING AND COMPETITION LOADS IN THE TRAINING SYSTEM OF MIDDLE-, LONG- AND ULTRA-LONG-DISTANCE RUNNERS.

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Women's competitions in five events were added to the track and field program only in 2018

ABSTRACT

One of the trends in the development of the global sports movement at the end of the 20th century is the significant expansion of sports, individual disciplines, and competition programs in which women athletes participate, ranging from team and club competitions to the Olympic Games. Despite all their humanism, the first organizers of the modern Olympics did not dare to allow female athletes to participate. In 2010 alone, 11 athletes were admitted to the tennis and golf competitions at the Olympic Games in Paris, which constituted only 0.8% of the total number of participants. At the first Winter Olympics, 13 women (4.4%) took part. In subsequent years, the Olympic programs gradually expanded, and at the 2016 Games in Atlanta, women made up 35%, and at the Winter Games in Nagano, 44.2%. Almost any sport mastered by men has become feasible for women.

Women's competitions in five events were added to the track and field program only in 2018, at the 20th Olympic Games. In 2016, in Atlanta, women competed in 18 of 44 events. In endurance running, women's competitions were included in the Olympic program for the 800m distance. Gradually, middle-distance, long-distance, and marathon running began to be held in five events: 800m, 1500m, 5000m, 10000m, and 42195m. Over the years of rapid development of women's track and field events, athletic achievements, both record-breaking and in popular sports, have steadily increased.

The difference in record results between men and women gradually decreased, reaching 9-11% in running speed across various middle and long distances. This progress was facilitated by the use of advanced training methods, typical for male runners, which had been perfected for over a century, as well as a system of sports orientation and selection (4, 115, 131, 188, 280). The main factors determining women's progress in endurance running, as with men, were the increasing level of training and competitive loads and a rational training structure in various training cycles (32, 47, 60, 80, 91, 160, 184, 215, 317). At the same time, the future prospects for the development of women's athletics, including endurance running, are naturally linked to the structural and functional characteristics of their bodies, as certain functional properties limit the achievement of high athletic results similar to those of men (level

of strength, maximum oxygen consumption, etc.) both throughout their careers and at specific stages related to the ovarian-menstrual cycle (OMC).

While it's impossible to say that the female body is less perfect, it does differ significantly from the male body in a number of respects. Therefore, the problematic situation underlying the present study lies in the contradictions between the methodological approaches to women's training, which, during its inception, relied on the use of almost all the principles of training male runners, which, until a certain point, ensured continuous progress in athletic achievement, and the further development of methodological principles for training women, taking into account the structural and functional characteristics of their bodies, which have been widely and comprehensively described in both sports medicine and sports methodology literature. Only by considering both the methodological principles for training middle-, long-, and ultra-long-distance runners and the morpho-functional characteristics of the female body is further progress possible in these popular athletics disciplines.

Therefore, given the current trends in the development of sports, there is a pressing need for an experimental justification for a system of long-term training for girls, young women and women in athletics that primarily require endurance.

The aim of this study is to improve the training system for women in middle-, long-, and ultra-distance running. Developing a theoretical and methodological framework for structuring women's training across multi-year and annual cycles, as well as during the immediate preparation for major events, taking into account the specific functioning of the female body and the dynamics of physical performance according to the menstrual cycle, will enable the long-term training of women in endurance running to be improved.

Object of study: A system for training women in track and field events that primarily require endurance.

Subject of the study: The relationship between the effectiveness of training for female endurance runners and the manifestation of age- and skill-related characteristics of their body functions.

Study results. For the first time, the problem of improving the long-term training of female middle-, long-, and ultra-distance runners was examined retrospectively and comprehensively from a methodological and medical-biological perspective.

For the first time, a retrospective analysis of the women's training system in endurance-based athletics was conducted. The factors that facilitate the progress of this system and its shortcomings at specific stages of development were identified.

The existence of four categories of female athletes with their inherent characteristics of biological processes, dynamics of motor qualities and performance in the phases of the OMC has been experimentally substantiated.

The age dynamics of sports results and the training and competitive loads that ensure them at different stages of the multi-year cycle were determined, which formed the basis for the development of regulatory requirements for sports schools.

The relationship between the primary means and methods of training female athletes at different stages of their development and long-term training was identified. Standard indicators for young athletes of various skill levels were developed and substantiated, primarily ensuring improved performance.

The peculiarities of the manifestation of physiological processes that ensure performance depending on the specific course of the pubertal period in young middle- and long-distance runners have been identified and substantiated.

The results of the conducted research can be used in programming the educational and training process for middle- and long-distance runners in sports schools and national teams of various ranks, at all skill levels, from beginner athlete to Master of International Class (MSIC). The developed theoretical and methodological principles and the proposed technology for their application have already been implemented in the following processes: - writing textbooks and methodological developments for students of physical education institutes and students of the Higher School of Coaches; compiling curricula; developing scientific and methodological recommendations for national team coaches; developing scientific and methodological recommendations for improving training methods for children and adolescents for a wide range of coaches and paired workers; preparing and writing collections of scientific papers, abstracts of reports at scientific and practical conferences on issues of women's sports.

A theoretical and methodological concept for training female middle-, long-, and ultra-long-distance runners in terms of age, taking into account their anatomical, physiological, and other individual characteristics. Factors that facilitated the progress of the domestic system of training women in middle-, long-, and marathon distance running in the 1960s and 1990s (the second half). Specific features of training four categories of runners with their inherent dynamics of motor capabilities and performance during the phases of the ovarian - menstrual cycle. Specific features of training interventions of various focus (speed, strength, special endurance), based on the typological characteristics of female athletes during the immediate preparation for the main start in high-performance sports. Trends in the development of sports training for young runners, taking into account age-related and methodological features at different stages of long-term training.

The first stage. The advanced development of training theory and methods was determined by the earlier inclusion of endurance running in the track and field competition program in our country than in other countries and the use of the training methods tested by men in middle-distance running. The second stage. An increase in the overall volume of training loads, especially running in the aerobic energy supply mode, optimization of the individual competition system, the introduction of medical and biological control methods, accounting of loads classified by types of energy supply, specialization of coaches of national teams and clubs in working with the female contingent, and the systematic use of training in mid-altitude conditions. The third stage. The greatest successes. Some stabilization of significant overall load volumes. Transition to a two-cycle periodization in middle- and long-distance running and, in some cases, to a three-cycle periodization for marathon runners ; More detailed planning and accounting of loads classified according to energy and methodological criteria, an increase in the volume of exercises aimed at increasing the level of strength endurance and speed-strength qualities, and improvement of scientific, methodological, and medical-biological support.

The main factors influencing the decline in the level of athletic achievements of Russian female athletes at major competitions were the following. The inclusion of the 1500m distance in the Olympic Games program and the holding of the World Cross Country Championships, which led to a rapid increase in the popularity of running and competition worldwide, led to errors in methodology: an irrational balance of running training methods, an unjustified

retention of high volumes of interval training with an anaerobic-glycolytic focus on energy supply, and a delay in significantly increasing the overall volume of training loads, especially aerobic running and cross-country running. The maintenance of achievements at the Olympics and their decline in the intervening years were due to organizational factors: reduced funding, a decrease in the number of centralized training camps, a lack of equipped sports facilities; and progressive commercialization , with the dominance of economic incentives in the construction of individual competition calendars for female runners, to the detriment of proven methodological principles.

Research conducted at all stages of the long-term training of female athletes specializing in endurance running revealed individual characteristics of the dynamics of performance and the manifestation of physical qualities in certain phases of the ovarian-menstrual cycle (OMC). Regardless of the athletes' level of training and qualifications, they can be divided into four categories: a) performance capacity and the level of physical qualities are relatively unchanged throughout all phases of the OMC; b) performance capacity and the level of physical qualities significantly improve during the menstrual and postovulation phases ; c) a significant improvement in motor qualities of performance during the ovulation phase with relatively stable manifestations in other phases; d) a significant decrease in performance capacity, the level of strength qualities, and special endurance during the menstrual phase with a relatively constant manifestation of speed abilities.

The bodies of female athletes assigned to these four categories have different predispositions to performing speed- and strength-oriented loads and to improving special endurance in various phases of the OMC, which is especially evident at the stage of immediate pre-competition preparation.

During the menstrual phase, category I and III athletes tolerate various types of workload satisfactorily, as evidenced by the cardiovascular system's response. Category II runners experience increased performance during this phase, as evidenced by their efficient responses to various types of workload. Category IV runners show a significant decrease in their functional state at rest and at work, as measured by heart rate and blood pressure. Strength-based workloads and those aimed at improving specific endurance lead to the maximum mobilization of the body's autonomic systems. Runners in this category tolerate speed-based workloads somewhat better, as evidenced by their performance and recovery indicators.

During the postmenstrual phase, all optimal loads of various types do not cause any deviations in the performance of category 1, 3, and 4 runners. The exception is category 2 athletes, who experience intense heart rate and blood pressure responses during loads aimed at improving specific endurance. Their recovery process is longer. During the ovulation phase, category 1 and 4 runners show stable cardiovascular responses to loads of various types, emphasizing their stable performance. Category 3 runners tolerate loads of any type most easily, and their cardiovascular recovery after work is rapid. During the ovulation phase, category 2 athletes perform strength-oriented work and work aimed at improving specific endurance, which places greater stress on the cardiovascular system.

During the postovulatory phase, runners in the first, third, and fourth categories showed stable cardiovascular responses to various types of exercise. Compared to the ovulatory phase, runners in the second category showed statistically significant improvements in cardiovascular response to strength training and in improving specific endurance.

The results of the study indicate that an individual approach to training planning should be carried out taking into account the following factors: a) the dynamics of the manifestation of the athlete's performance in the phases of the OMC ; b) the characteristics of the manifestation of motor qualities in different phases of the OMC; c) the predisposition of the athlete's body to perform loads of a certain magnitude and direction throughout the OMC.

The high effectiveness of the training system, while respecting the identified factors, is directly confirmed by the medals won by 32 Russian runners at the Olympic Games, World Championships, and European Championships. This is indirectly confirmed by the fact that only two of them trained in mixed-gender groups, while 30 were trained by coaches in women's groups. Although not all of the "women's" coaches were familiar with the theory of load distribution across the OMC phases, they intuitively, based on their experience, individualized their training to a certain extent with the athletes.

Research has confirmed that the long-term training system for young female athletes is closely linked to their age-related changes: biological age, sensitive periods of physical development and body height -weight parameters, and responses to adequate loads. Furthermore, increased athletic performance is ensured by a continuous increase in training demands and a gradual increase in the complexity of the annual competitive training cycle.

Conclusions. Theoretical and experimental data, along with a summary of cutting-edge sports experience, confirmed the main hypothesis that further improvement of the training system for women specializing in middle-, long-, and marathon distance running will be associated with the effective implementation of their individual characteristics during long-term training. Despite the fact that the fundamental methodological principles of competitive and training activities for male and female athletes remain largely identical, the development of a domestic system for training women in endurance running over the centuries was associated with the continuous expansion of the Olympic Games, World, and European Championships, from the inclusion of a single 800m distance to five sets of medals in 800m, 1500m, 5000m, 10000m, and 42195m races.

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