



## FUNCTIONAL READINESS AND THE PROBLEM OF TRAINING PROCESS MANAGEMENT.

Masharipova Rano Yusupovna  
Tashkent State Medical University  
ranowmasharipova@gmail.com

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*For the first time in an experimental annual training cycle, a gradual increase in training loads was implemented using a mixed energy supply mode*

### ABSTRACT

*Significant issues related to optimizing the structure, volume, intensity, and especially the dynamics of training loads for young skiers remain insufficiently studied. Analyzing the results of control competitions, functional fitness dynamics, and especially the results of major competitions for young skiers, a number of authors believe that traditional load planning does not contribute to achieving higher results in the main starts of the season. According to numerous literary sources, the traditional annual training cycle for young skiers has some shortcomings in the distribution of training loads throughout the annual sports training cycle. The main drawback, in our opinion, is that the bulk of the loads are essentially applied at the beginning of winter competitions, i.e., in November-December, and in a significantly smaller volume at the end of the season - February-March. V.S. Fomin emphasizes that not total "maximization" of loads in cyclic sports, but scientifically based "economization" can become a promising direction for finding solutions, especially in children's and youth sports*

**The aim of the study** was to increase the sports and health effectiveness of the training process for young skiers by taking into account the dynamics of their functional fitness.

**The object of the study** is young skiers and racers of the national team aged 11-15 years.

**The subject of the study** is the structure and distribution of loads in the dynamics of the annual training cycle of young skiers.

**, the following main tasks** were envisaged:

1. To study the structure and dynamics of the traditional distribution of loads in the annual training cycle of young skiers.

2. To experimentally justify the training load regimen based on their health-improving effectiveness.

3. To test the effectiveness of the experimental training load regime in the dynamics of the annual training cycle.

**Study results.** It is hypothesized that implementing the fundamental physiological principles of sports training—improving adaptive mechanisms not to prolonged exposure to a constant volume of training loads, but to a gradient of these loads (a wave-like increase in intensity from start to start, with a maximum volume before the main competition for specific athletes)—will not only reduce the overall functional deficit but also significantly increase the functional reserves of young skiers, and, as a result, enhance their athletic skills.

For the first time in an experimental annual training cycle, a gradual increase in training loads was implemented using a mixed energy supply mode, with a gradual increase leading up to the main season start for the supervised team in February, while the volume of ineffective aerobic training loads was simultaneously reduced. As a result, the training loads were reduced while simultaneously increasing the athletic and health-improving effectiveness of the training loads. For the first time, the excessive and inadequate distribution of training loads in the annual training cycle of young skiers was identified and quantified. The results of the pedagogical experiment allowed for a reduction in the total training time by an average of 340 km (15%), and the volume of cross-country skiing by 14%, which contributed to the increase in the functional reserves of young skiers and an improvement in their athletic skills.

The developed experimental load distribution regime was implemented into educational and training practice and ensured a significant increase in the athletic skills of young skiers (7 athletes out of 12 achieved the standard of the 1st adult category, instead of the 1st in the control cycle) and the level of their functional fitness, which was confirmed by two implementation certificates.

The study's results can be applied to other cross-country skiing disciplines. In the traditional annual training cycle, young skiers completed a very high total volume of cyclic training—over 2,000 km per season, more than half of which was performed in a low-efficiency aerobic energy regimen. The monthly peak occurred during the first competition of the season in December and then gradually decreased, leading to cumulative fatigue in the young skiers and a progressive decline in competition results. In the experimental regime, the total volume of cyclic training increased gradually and in waves from competition to competition, reaching its maximum before the main competition for the supervised team. This resulted in an average 15% reduction and an increase in the effectiveness of the annual training cycle. The introduction of the principle of a wave-like increase in the volume of training loads in a mixed energy supply mode for the main competition for the team's athletes ensures not only a reduction in the overall overall physical activity, but also an increase in the health effectiveness and athletic skill of young skiers.

**Conclusions.** Of young skiers' daily time budget, 51% is spent on scheduled school activities, 21% of which is spent on various forms of physical activity. However, only 5% of this time is spent on physical activity in the school (physical education classes, recess), while the remaining 16%. According to the traditional training system, young skiers perform a very large volume of cyclical loads—an average of 2,290 km during the annual training cycle, of which more than half (1,200 km, or 52%) is performed in a low-impact aerobic energy supply mode. Meanwhile, the most health-improving, mixed energy supply mode is used for an average of no more than 40% of the total load. The monthly peak (an average of 500 km) occurs at the first

start of the season in December, and then gradually decreases due to the accumulation of moderate fatigue. At the beginning of the experimental annual training cycle for young skiers, unlike the traditional (control) cycle, the intensity of mixed (aerobic-anaerobic) energy supply was moderated. This intensity was then gradually increased in waves toward the main season start for the supervised team in February—to a total of 440 km instead of 320 km in the control cycle, a 17% reduction. This was accompanied by a simultaneous reduction in non-productive aerobic energy supply. As a result, the experimental annual cycle saw a decrease of 330 km, an average of 15%.

The implementation of the developed more "economical" distribution of training loads in the annual pedagogical experiment allowed for a significant increase in the functional capabilities of the young skiers' bodies, as evidenced by the achievement of a higher level of development of the energy and motor components of functional readiness for the main start for the team in February - on average up to 60-70% of M, instead of 52-54% of M in the traditional (control) annual training cycle.

An experimental distribution of loads based on their energy focus in the annual training cycle for young skiers proved not only more "economical" but also more effective than the traditional method. This was confirmed by a stable and statistically significant improvement in all motor fitness indicators based on the results of control competitions by an average of 3-5%. The traditional training regimen for young skiers demonstrated minor and insignificant changes in competition results compared to other previously conducted training cycles for young skiers.

The implementation of some basic physiological principles of sports training - the development of adaptation mechanisms not to the long-term impact of a constant volume of training loads, but to the gradient of these loads, a gradual increase in priority loads in a mixed energy supply mode, made it possible not only to reduce by an average of 15%, but also to significantly increase the functional reserves of the body of young skiers, and to ensure a statistically significant increase in the level of their athletic skill by 3-13%, to the level of the 1st adult category.

**Practical recommendations.** To improve the specialized training and health benefits of young skiers' sports training at the base, we recommend:

- when distributing loads in the dynamics of the annual cycle, take into account the physiological requirement that the athlete's body must adapt not to the magnitude of long-term and monotonously performed training loads, but to the gradient of these loads, with a wave-like increase in their intensity from moderate and average, to maximum for each most important competition;

- use loads that are as adequate as possible to the main sport and performed primarily in the most health-effective mode of mixed (aerobic-anaerobic) energy supply, since work in the aerobic energy supply zone (moderate power zone) has practically no training effect, and the monotonous nature of these loads in cross-country skiing can cause a negative effect;

- At the beginning of the annual cycle, contrary to traditional practice, moderate the use of mixed-energy loads. The recommended reduction at the beginning of the cycle should be achieved primarily by performing loads in aerobic energy supply mode, which can ensure their completion with a relative lack of fatigue. Subsequently, gradually increase the volume of cyclic

loads performed in mixed energy supply mode. This should be maximized not by the start of the competition, but by the main event for the individual athlete or team.

- some of the basic physiological principles of sports training outlined above should be taken into account for the development of the adaptive mechanisms of the athlete's body, which will not only reduce, but at the same time significantly increase the functional reserves of the body of young skiers, and ensure an increase in the level of their athletic skill;

- the effectiveness of annual training cycles for young skiers should be assessed based on the dynamics of motor and functional fitness, as well as the results of control competitions and the main starts of the cycle;

There is reason to believe that the athletic and health-improving effectiveness of the experimental training load distribution regimen for young skiers could have been even greater, but excessive, albeit psychologically justified, caution on the part of coaches prevented an optimal reduction in the volume of ineffective aerobic and anaerobic energy consumption, which, in our opinion, remains somewhat excessive for young skiers. It is also recommended that the developed experimental load distribution regimen be tested during the annual training cycle of young skiers, which could contribute to improving not only the athletic but also the health-improving effectiveness of the basic training phase of highly skilled cross-country skiers.

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