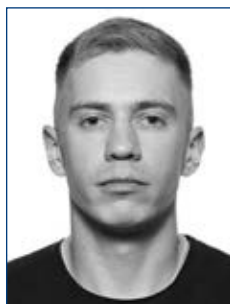




Sports training for 16-17 years old skiers-racers in mid-mountain conditions

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Abstract

Objective of the study was to determine the effectiveness of various approaches to the organization of the training process of 16-17 year old ski-racers in the competitive period in mid-mountain conditions.

Methods and structure of the study. The experiment involved two groups of young men with the 1st sports category, and a candidate for master of sports. The experimental group used the traditional approach with the inclusion of two cycles – adaptation and transition. The peculiarity of the organization of the training process was a gradual increase in the volume of low-intensity load against the background of monitoring adaptive-compensatory mechanisms and an increase in the intensity of the load by a repeated and variable method against the background of a reduced volume by the end of the cycle. The control group used a block approach, the features of which were the inclusion of a block of foothill training and the use of two peaks of high intensity in a weekly microcycle when training in the mountains, using the interval method against the background of underrecovery.

Results and conclusions. The results of the experimental group in all priority functional indicators significantly exceeded the results of the control group. A significant increase in the results in the 7.5 km race occurred in both groups and was almost the same. At the same time, it should be taken into account that the athletes of the control group used more stringent work regimes. This confirms the forcing of training, which, in our opinion, is unacceptable in these conditions for athletes of this age.

Keywords: skiers-racers, training process, training in the middle mountains, functional indicators.

Introduction. The current stage in the development of cross-country skiing is increasingly characterized by competitions in mountainous conditions, and athletes must be ready for them. In this regard, the question arises at what age it is necessary to start using training in mountainous areas in order to avoid the process of forcing training in young athletes - on the one hand, and to have time to identify athletes who actively respond to training in the middle mountains for their gradual acquisition of mountain experience, with the purpose of rapid adaptation to mountain conditions, on the other. The authors take the position that the age of 16-17 years is optimal for this, since it is a kind of transitional stage for cross-country skiers, after which they move to the stage of adult athletes and

compete at the same distances as adults, and, accordingly, endure the same physical loads [1-3].

Objective of the study was to determine the effectiveness of various approaches to the organization of the training process of 16-17 year old ski-racers in the competitive period in mid-mountain conditions.

Methods and structure of the study. The experimental study was carried out during two training events in the competitive period of the annual macrocycle. The study involved 20 young men with the 1st sports category and the category of a candidate for a master of sports, 10 people each in the control and experimental groups. The first training event took place at an altitude of 1500-1600 m above sea level.



The second training event continued at an altitude of 1000 m.

The training process of the experimental group included two cycles. The first is adaptive. Its characteristic features include: a large amount of low-intensity work (zone 1); power and short speed work in the hall; reducing the volume and intensity of training; conducting skiing trainings of an aerobic nature lasting from 1.5 to 3 hours; the volume in long-term training varied, based on the preparedness and functional state of the athlete.

The second cycle is transitional. Its features are: volume training of low and variable intensity; conducting an ECG before starting a workout to identify functional abnormalities; conducting a long tempo free style training the next day after functional diagnostics (see Table 1).

A long tempo workout consisted of three series, each of which included: three laps of 2.5 km in intensity zone 2 (heart rate 140-160 bpm) and one lap of 2.5 km at the ANOT level.

Each series is performed continuously, except if the athlete needed to replenish the water-salt balance.

In table 1 shows the indicators that the athlete must adhere to in each circle and in each series.

Results of the study and their discussion. The training process of the experimental group was based on the scientific works of V.N. Platonov and V.N. Seluyanov, and consisted of six weekly microcycles, in which 23 full training days were planned, 10 days of unloading, of which seven days with rest in the morn-

ing, three days with rest in the afternoon and five full days recreation.

The peculiarity of the approach was that at the beginning of microcycles, the volume of low-intensity load was gradually increased by a uniform method, against the background of monitoring the adaptive-compensatory mechanisms of the body of young skiers. At the end of the cycle, the intensity of the load performed by the repeated and variable method increased against the background of a reduced volume. Such an alternation of loads, in our opinion, helps to reduce the risk of adaptive failures and poorly controlled processes in the functional system of the body.

The training process of the control group was built on the principle of block periodization. The peculiarity of this approach was the inclusion of a block of foothill training, followed by a block of training in mountain conditions, including "calm aerobic work" in the acute and transitional phases of acclimatization and "hard work" in the stabilization phase. After that, the control group performed the work using the same microcycles as the experimental group, but the training process used an approach using two peaks of high intensity in a weekly microcycle. In the training process of the control group, various intensities were used, including the use of the interval method, in which a repeated load was performed against the background of incomplete recovery.

As the main criteria determining the effectiveness of the proposed training approaches, we used the functional indicators of cross-country skiers, which

Table 1. Indicators that an athlete must adhere to on each circuit and in each series of a long tempo workout

Series	1st round, min, s	2nd round, min, s	3rd round, min, s	4th circle (ANOT), min, s
1	9:05	9:15	9:10	7:35
2	9:15	9:15	9:30	7:30
3	9:00	9:05	9:20	7:25

Table 2. Comparison of functional indicators of cross-country skiers using different mountain training approaches

Functional indicator	KG X+m	EG X+m	KG X+m	EG X+m
	Before training in the mountains		After training in the mountains	
Rufier test (index)	3±0,16	3±0,1	3±0,15	2±0,1
Robinson index	94,3±0,8	93,9±0,8	92±1,3	87,8±0,8
Stange test, s	86±0,3	84±0,3	87±0,5	95±0,5
Genchi test, s	23±0,2	24±0,2	25±0,2	32±0,2
Hemoglobin level (g/l)	148±0,6	150±0,7	152±0,6	156±0,7
VC (l)	4,15±0,09	4,24±0,08	4,47±0,06	4,91±0,25



have the highest correlation with the result in distance races (see Table 2).

According to the table above, it can be concluded that the results of the experimental group in all priority functional indicators significantly exceed the results of testing the control group. In this regard, it can be argued that the approach used by the experimental group turned out to be more effective than the approach of the control group in terms of functional shifts.

In addition to functional indicators, the results of control starts in skiing at a distance of 7.5 km, carried out before and after using different approaches in training in the middle mountains, were compared. Both control starts were held on the plain at the same complex. A significant increase in the results in the control group was 31 s in the experimental group 35 s. This once again confirms the effectiveness of using the middle mountains in the training of cross-country skiers. Despite the fact that the improvement in the results of both groups is almost the same, it is worth considering that the athletes of the control group used more stringent work regimes than the athletes of the experimental group, thereby there was an element of forcing, which, in our opinion, is unacceptable for athletes of this age and in these conditions.

Conclusions. The middle mountains are an effective height for the training process of ski racers aged 16-17. A properly organized training process at such a height can give a very impressive addition to the sports results of athletes of this age group. To do this, you must adhere to the following rules:

- gradually increase the level of heights starting from 900-1500 m at the beginning of the use of the

middle mountains and, with the acquisition of mountain experience, bring it to the level of 2500 m;

- during the period of acclimatization, it is necessary to reduce the total volume of the load by 10-15% of that performed in the usual flat conditions;

- reduce the load to adapt to new climatic conditions and create conditions to ensure a favorable restructuring of the body and maintain an optimal level of fitness in the first week after returning from the mountains to the plains;

- to connect the structure and content of the training process during the period of reacclimatization with the training process carried out in the middle mountains;

- the main methods of training cross-country skiers 16-17 years old in mid-mountain conditions should be uniform and variable.

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