Improving the endurance of management students with the help of alternative aerobic means

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Abstract

Objective of the study is to evaluate the effectiveness of various aerobic forms of physical activity in developing the endurance of students majoring in management.

Methods and structure of the study. The relationships between the load characteristics of aerobic motor activity and changes in endurance indicators were studied in 48 students aged 18.5±1.6 years, represented by groups engaged in athletics, hiking, cycling, and swimming.

Results and conclusions. According to the developed training programs, the content of endurance development measures is focused on triggering mechanisms of adaptation to cyclic loads in uniform modes of functioning of the motor-cardiac sphere. The strength of the links between the use of alternative means of physical activity and the level of endurance development indicates the advisability of selectively using the content and technological components of physical activity in solving the tasks of physical education for students.

Keywords: *development of endurance, students, types of physical activity, cyclic loads.*

Introduction. The imperatives of the National Project 'Sport – the Norm of Life' are the development of physical qualities in young students, the most important of which is endurance [5]. Student age is the most favorable period for developing endurance without resorting to maximum and submaximal intensity loads [4].

To develop general endurance in physical education classes, steady long-distance running in aerobic mode is usually used [3]. At the same time, there are many types of physical activity that are attractive to students and contribute to the development of endurance, including running of varying duration [2].

The modern concept of sports training is based on the fact that adaptation processes depend mainly on the magnitude of training stimuli and the body's response, which is largely determined by the individual characteristics of the person exercising [1].

Despite numerous studies, to date, no universal, universally recognized system has been developed that allows for precise control of students' aerobic capacity. Given that the adaptive capabilities of students under the combined influence of physical and educational factors are limited, the most important task of physical education is to develop means of varying the specificity of training loads with a general focus on improving the aerobic capacity of students. At the same time, it should be noted that the use of various means of physical activity makes an unequal contribution to improving the functional base of students, which can have both a stimulating and a destructive effect on the formation of students' educational competencies.

Objective of the study is to evaluate the effectiveness of various aerobic forms of physical activity in developing the endurance of students majoring in management.

Methods and structure of the study. During the training program, the relationships between the load characteristics of various aerobic forms of physical activity and changes in the endurance indicators of 48 students aged 18.5±1.6 years, belonging to the main group in terms of health status for physical education classes, represented by groups of athletics, hiking, cycling, and swimming.

Track and field running classes were held three times a week for 4 months in the form of cross-country training on various surfaces, avoiding hard ground. Shoes with shock-absorbing soles were used. The running pace was selected individually. Initially, low-intensity aerobic running loads (120-130 bpm) were used, which were alternated with walking when necessary. The duration of continuous running was 7-10 minutes at the start and was gradually increased to 30-40 minutes. The pedagogical emphasis was placed on deep breathing with powerful short exhalations.

Hiking involved walking certain tourist routes of varying length, elevation and difficulty. Hiking trips lasted 1 time a week for about 4-6 hours with a 10-15 minutes' rest after each hour of hiking, as well as shorter breaks of 1-3 minutes after intense movement (15 minutes) associated with overcoming difficult terrain. The main type of exercise was aerobic, with short intervals of mixed aerobic and anaerobic exercise when walking uphill. The intensity of the exercise, controlled by heart rate, was 120-130 bpm; during breaks, the heart rate was brought down to 80-90 bpm.

Cycling included cyclical exercise twice a week with high energy expenditure based on cycling skills. Classes lasting 1-3 hours were held in a group of the same physical fitness level; city routes alternated with riding on roads in rough terrain where cyclists were allowed. The intensity of the load varied from low to medium, and the heart rate was 125-140 bpm.

The swimming group included students who were confident in their ability to move in the water using their chosen method. Endurance training included steady swimming for 30-40 minutes at a heart rate of 125-135 bpm. Each training session included swimming in a specific style (except for butterfly). Before the start of the session, flexibility and joint mobility exercises were performed in the water.

The level of general endurance was assessed using special exercises.

Results of the study and discussion. According to the training programs developed, the content of endurance development measures focuses on triggering mechanisms of adaptation to cyclic loads in uniform modes of functioning of the motor-cardiac sphere (Table 1).

The focus of the program material, which includes combinations of low- and medium-intensity aerobic exercises used to plan and select possible options for class content, expands the possibilities for technological approaches to developing students' endurance. The validity of the polystructural approach is indicated by a reliable increase in endurance indicators in the physical education structure of the test subjects from 4.3% to 12.8% in each of the structural components of the educational model implementation.

In the basic configuration, hiking equipment, which increase the aerobic capacity of the body by varying the intensity of the load, elevation changes, length and complexity of tourist routes, have a high developmental potential, which indicates the resonant nature of adaptive restructuring that forms a new essence of students' physical fitness.

Cycling tourism resources lay the foundation for the transition of physical education to a higher aerobic regime based on the transformation of operational tools and the stimulation of energy supply capacity.

The functionality of swimming training has determined the development of special endurance based on swimming skills. The steady growth of functional capabilities and the power of energy systems is set by the target guidelines of the training process, corresponding to the level of functional preparedness of students.

Table 1. Dynamics of student endurance indicators

Indicator	before	after	P-value	
3 km run, s	755,7±26,7	672,3±28,4	3,4	< 0,05
5 km walk, s	2846,1±128,5	2661,4±234,2	6,0	< 0,05
10 km cycle, s	1486,1±334,8	1179,3±345,9	5,6	< 0,05
300 m swim, s	297,7±67,2	279,5±45,2	6,1	< 0,05

The representativeness of changes in the energy supply of muscle activity is due to adaptive processes that stimulate aerobic mechanisms for improving performance, hemodynamics and energy metabolism when mastering each of the physical education programs.

The selective choice of the type of physical activity determines the balance and expediency of using various means to improve the functioning of bioenergetic systems responsible for the aerobic supply of muscle work.

The developed options for the selective use of alternative means of physical activity, based on the specificity of the training impact with a general focus on improving the aerobic capabilities of students, ensure an effective increase in the functional capabilities and quality of endurance of students.

Conclusions. The results obtained prove the effectiveness of meaningful variation in training programs based on cyclical means of developing endurance with uniform prolonged exposure to moderate-intensity loads. The strength of the links between the use of alternative means of physical activity and the level of endurance development indicates the advisability of selectively using content and technological components of physical activity in solving the tasks of physical education for students.

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