POSSIBILITIES OF INCREASING THE PHYSICAL HEALTH STATUS OF STUDENTS DIFFERENT MODES OF RACING LOADS

Serorez T.B.
Donetsk National Technical University

Annotation. *Purpose*: to substantiate theoretically and experimentally verify technology aimed at improving the process of university students in extracurricular athletics. *Material*: the study involved 413 male students aged 21-23 years. *Results*: organize and compile materials 26 references, extracurricular training program designed jogging, investigated the level of aerobic and anaerobic productivity first men of mature age, experimentally proved improving technologies for university students on the basis of cross-country use loads. Investigation of the influence of cross-country training of different directions on aerobic and anaerobic performance of the body indicates the advantage of cross-country loads that stimulate anaerobic energy processes. Confirmed the close correlation between aerobic and anaerobic performance and endurance of the organism, which gives grounds to consider the latter as one of the main components of physical fitness. Found that the relationship of aerobic and anaerobic capacity of the organism to other quality parameters of motor activity is weak or absent. *Conclusions*: it was found that the effectiveness of training depends on the energy of work and energy.
Keywords: aerobic, anaerobic, performance, physical, health, exercise, lactate, motor.

Introduction

The problem of improving health status is the most urgent thing for senior students is also caused by the absence in most Ukrainian universities mandatory physical education classes to educational levels "Expert" and "Master" or due to low quality of the respective classes. Above problem has increased particularly over last 20 years - in that time, scientists have recorded a significant decline of indicators which characterizing the physical state of the Ukrainian [4, 24]. According to the WHO, more than 80% of children and teenagers have significant deviations in health. Thus one of the perspective ways to solve it, is the development and implementation in the educational process of health technology. The largest reserves of using these technologies rooted in efficient organization of extracurricular classes with students (L.P. Sergienko, 2007; Krutsevych T.Y., 2010, U.M. Furman, 2011).

Purpose, tasks of the work, material and methods

Purpose of research - was in the theoretical justification and experimental verification technologies directed for health improvement of university students during extracurricular classes in athletics.

Tasks of study - was to systematize and synthesize materials of literary sources, develop programs of extracurricular jogging classes, investigate the level of aerobic and anaerobic performance of the adult male - students body, substantiate health technology for university students through the use of running loads.

Research Methods. We investigated the effectiveness of exposure classes using running loads of aerobic and anaerobic orientation on physical health of adult male – students (21 - 23 years). Choosing this group for study effectiveness of investigated running programs is conditioned, on the one hand of scientific information that the level of men physical health, which is determined by the relative measure VO2 max, significantly lower than women. The average value of VO2 max for men below "safe" health levels, and women level significantly higher [5, 23].

Experimental research work carried out at the HSI “Lugansk National University of Taras Shevchenko”. The study involved 413 male students aged 21 - 23 years and 17 sports teachers and doctors. In general, the course of the research examined 413 males (students) aged 21 - 23 years, from which 109 persons were engaged in running for 24 weeks in accordance with the established programs. Results were 7 used programs dictated by training power supply mode operation and load volume. Physical education of persons who were in eighth (control) group was carried out in accordance with the curriculum for universities of Ukraine: studies conducted by training schedule (twice a week) and once a week on their own. In classes were used exercises from athletics, gymnastics, sports and outdoor games. In classes exercises used in athletics, gymnastics, sports and outdoor games. Examination carried out in stages - before the training cycle after 6, 12, 18 and 24 weeks from the start and after 6 and 12 weeks after their finish. It is allowed to trace the dynamics of changes in the studied parameters.

Results of the research

To improve physical health can be apply different modes of physical training, but their effectiveness depends on the method of training, duration and frequency of sessions and the work mode of power supply [8, 22], which respectively displayed on the functions of the body [3]. Uninterrupted training method may be accompanied by performing work in aerobic and mixed-mode of power supply. In this case, the load will be effective under conditions of high systolic blood volume and oxygen consumption. The optimum level of indicators of performance achieved during continuous operation which duration from 10 to 90 minutes at heart rate 145-175 beats p/min. This mode of operation also contributes capilarithation of infarction. According to V. Platonov [17], the maximum effectiveness of training intensity is shown at work at the level of the threshold of anaerobic metabolism (TANM). Moreover, a positive effect on aerobic performance with stress intensity closer to TANM can occur for the duration of sessions about 10-12

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minutes. There is also an opinion due to applying the method of continuous running load, duration shall not be less than 30 minutes at the intensity that provides a significant stimulation of aerobic processes. The level of oxygen consumption thus should be around its maximum value. To achieve this level of oxygen consumption possible only after 3-7 min [4]. Implementation of these loads requires optimal mobilization functions of cardio-respiratory system that provides transport of oxygen to the working muscles. By increasing the running load by duration of the constant intensity can achieve greater training effect [23]. However, after a period of extended operation observed inconsistencies in activity of systems what provides oxygen transport to the working muscles. This is manifested by decreasing systolic and cardiac heart output, oxygen consumption, increased heart rate, deviation between external respiration and oxygen consumption, breathing and circulation.

F.P. Suslov [20] argues that running loads in aerobic mode power supply, when using a continuous method can be divided into three zones:

The first - replacement. When running heart rate increased to 130 beats/min. Work with such heart rate only improves capilarithation of muscles of the foot, shin and thigh, but shows no drilling action on the myocardium. Oxygen consumption in this area is less than 50% of VO2 max.

The second area - maintenance. When working in this area heart rate increasing up to 130-150 beats/min. These workouts cause cardio respiratory system biochemical, morphological and functional changes that enhance performance of aerobic organism. Oxygen consumption is 50-60% VO2 max.

The third area - developing. When working in this area heart rate increasing up to 150-170 beats/min. In this mode, the system receives cardio respiratory significant biochemical, morphological and functional changes that enhance the body's aerobic performance. Oxygen consumption is 60-80% VO2 max.

Heart rate range for each of the above mentioned areas approximate and depends on age. With age the maximum heart rate for each zone decreases. Some researchers [21] believe that stress in aerobic mode power supply is the best way of training systems, which in extreme conditions to ensure its homeostasis.

Individuals with high levels of aerobic exercise performance level of 40-60% VO2 max followed by lactate accumulation around 2-2.5 mmol /L, which does not provide the power increasing and capacity of aerobic process.

According to some scientists the effect of aerobic exercise aerobic direction can be shown in 16 [18] or even 12 [22] weeks from the start of classes, and the cumulative training effect stored for 16 weeks at the end of the training cycle. However, recently appeared work showing the impact of ineffective workouts in aerobic mode power supply on the performance VO2 max, both men and women [26].

Comprehensive and complete formation of adaptive rearrangements of various body systems, providing aerobic power supply occurs within 8-10 weeks from the start of training. According to the research, B.M. Shiyan, O. Drozd [25], health training for eight weeks contribute to a significant increase in the physical condition of young men aged 17-21. Such term, in their opinion, can be considered as meso cycle training health areas. According to A.N. Aheyenka plausible increase of physical performance and level of physical health may not be earlier than one year after the start of classes. It is believed, that the optimum adaptation of the aerobic energy supply system is achieved when the intensity of work at about TANM [12]. However, not in all cases work at this level of intensity is effective for improving aerobic capacity of the body. The well-trained persons exercise with the intensity does not bring the desired effect, because in such cases it is recommended exercises a significant stimulation of glycolytic energy supply processes.

Physical work intensity level TANM can achieve substantial improvements in aerobic capacity power supply system [16], however, it should focus on the individual functionality of the human body. Particularly for beginners load intensity 50% VO2 max during the duration of 30-40 minutes will increase the body's aerobic performance and qualified for distance runners will load stimulating intensity of 80-85% VO2 max and lasting 1-2 hours. Moreover, after a few months of training untrained persons level of oxygen consumption at hour run could rise from 50% to 70-75% VO2 max.

To improve aerobic performance in the application of the continuous method important role played duration, intensity and frequency of sessions. There is evidence, that for the growth of aerobic performance, effective can be two-time classes per week.

However, excessively long work that does not correspond individual abilities of the body, leading to a decrease in training effect due to a progressive decline in oxygen consumption, a decrease in systolic blood volume and cardiac output while increasing the heart rate and minute volume of respiration. Also obtained data under which the effectiveness of training is much higher in frequency classes 4-5 times per week than 6-7 times.

To increase aerobic performance while running training using re-run length method during each repetition should slightly exceed the period of study (3-7 min), and running speed reach 60-70% of the maximum 10.

Significant effects on aerobic performance body have special modes of interval training. They can run for long and short periods.

By interval training on long intervals (repeat three minute exercise in anaerobic-aerobic energy supply mode) can achieve substantial improvements in maximal oxygen consumption, despite the short duration of classes (about 15 min) [19]. There is a model of interval aerobic training orientation, known as “training for Freiburg rules”. It’s developed by West German scientists under direction of Professor H. Reyndelya and involves short runs lasting 30-90 sec at speed of 70-80% of maximum. Duration of the pause corresponds to the duration between running [10]. This work stimulates sufficiently aerobic energy processes in the tissues without causing significant changes in anaerobic

metabolism. Only the repetition of the first 5-6 runs observed a slight enhancement of glycolysis. Upon further repetition of classes, the content of lactic acid in the blood decreases. It follows that the aerobic capacity of the body by using this model training, jogging must be repeated at least seven times. Training in this mode causes physiological hypertrophy of the myocardium, improving the circulatory hemodynamic parameters, which is called the circulatory similar training.

An effective method to improve aerobic performance indicators is interval training at short intervals.

Researches of I.Tabota shows effective increasing of VO2 max rate after 6 weeks from the start of classes with intervals 5 times per week training in the application at short intervals (repetition 20sec. runs at intervals of 10 seconds). However, there is some information about the ineffectiveness of interval training for short periods of aerobic performance in relation to the frequency of sessions three times per week [7].

A model of interval training that stimulates aerobic performance is the so-called "myoglobin" interval training [11]. It is characterized by the alternation of very short runs lasting from 5 to 10 sec. intervals of rest, which is equal to length the run. The rate of run should be pretty high, but not maximal, movements executed freely, without tension. In such mode of operation in a short period spent intramuscular supplies of oxygen bound to myoglobin, but they are quickly replenished in a short pause of rest. As a result of this work, after 4-5 runs oxygen consumption almost reaches the level of VO2 max and maintained until the end of the workout. It should be noted, that the total amount of work in this mode should be big enough.

In order to achieve an increasing performance of anaerobic organism used training in two ways - by increasing ablactate and lactate anaerobic capacity of the organism. Classes, which directed to develop ablactate anaerobic capabilities and re-used methods of interval work. The main objective of such training is to achieve maximum cost macroergic phosphate compounds in the working muscles and increase the activity of key enzymes ablactate anaerobic system (adenozyntryfosfat and creatine) in terms of accumulation of products of anaerobic decomposition (ADP, H3PO4, lactic acid, etc.). Solve this problem is possible only through the repetition of a large number of runs the duration of which does not exceed 10-15sec. each intensity 90-95% of the maximum possible [9, 10].

When using method of repetitions the most appropriate load duration 5-10 sec., performed with maximum intensity. When using the most appropriate method is repeated load duration 5-10 s, performed with maximum intensity. Long pauses between them (2-3 min) allows for the recovery of macro phosphate (ATP and KRB) and to prevent significant activation of glycolysis in the performance of regular jogging [15]. Active splitting of ATP and KRB in carrying loads such orientation causes a sharp increasing of rate of oxygen consumption during the first few seconds after the operation, when a KRB oxidative resynthesis in muscles. Top speed of this process is observed during the first minute of recovery. Moreover, oxygen consumption during this period increases with every jog up to 5-6 repetition indicating a significant cost ablactate anaerobic energy supply resources. Along with an increase in oxygen consumption, lactic acid builds up. "Peak" oxygen consumption, depending on the level of aerobic performance reaches 2.3 L/min, and the concentration of lactic acid in the blood of 100-120 mg%. Upon reaching the critical value of cost of inventories KRB in working muscles immediately reduced power operation. This state is reached at 8-10 repetition of jogging. Because this number of repetitions should be considered optimal for development ablactate anaerobic performance. However, such training is not only increasing power ablactate, but also increase the power and mobility of lactate anaerobic energy supply process [6].

These loads, for maximum mobilization ablactate energy sources are not able to use them more than 50-60%. For full use by muscles ablactate energy supply reserves work is performed with the highest possible intensity for 60-90 sec., which is considered optimal for improving the process of glycolysis. With such work the concentration of ATP in muscles is reduced to about 60% relative to the value at rest, even when using the maximum load capacity (ablactate anaerobic character).

To improve the ablactate anaerobic performance using interval running workouts for short periods at maximum speed - "interval sprints." The duration of each jogging and intervals of rest between them are the same as in "myoglobin" training, but the work is carried out series of 5-6 runs each. Total performed 2-3 series with intervals of rest between them at least three minutes. At the end of each jog rate of oxygen consumption reaches its highest values with a slight decrease in the pauses of rest. Oxygen consumption reaches a "peak" of the fifth or sixth repetition and consistent VO2 max. Due to the fact that the resynthesis of ATP reserves spent during each run, carried out not only by oxidative phosphorylation, but also by glycolysis after 5-6 jog content of lactic acid in the blood reaches the level of 100 mg% or higher.

V.S. Mishchenko [14] believes that training using threshold loads increased glycolytic not only, but also oxidative enzyme capacity, which leads to an increase not only the anaerobic (lactate), but aerobic performance.

Repeated execution of running loads anaerobic glycolytic orientation through unregulated intervals of rest is a constant increase in the concentration of lactate in the blood, which reaches a maximum value after the fifth repetition. However, if the concentration of lactate in the blood is increased from exercise to exercise, in the working muscles, this figure is maintained at the constant level from the first exercise. The duration of work does not affect the concentration of lactate in the muscles. When re-working of glycolytic mode energy supply the end of each jog reaches almost level of oxygen consumption VO2 max. The duration of work does not affect the concentration of lactate in the muscles. When re-working of glycolytic mode energy supply the end of each jog up to the level of oxygen consumption VO2 max. The maximum numbers of repetitions of runs depends on the reduction of glycogen in the working muscles and achieve limit values acidification. Typically, this condition occurs on 6-8 repetition [10].

When performing interval work glycolytic anaerobic nature reduced rest breaks. Their duration does not exceed duration of the work. Under these conditions, oxygen consumption, as well as the application of continuous and repeated methods of reaching VO2 max. But unlike other methods, with interval work achieved the highest rate of glycolysis in the working muscles and the highest values of maximum accumulation of lactic acid in the blood [10]. Therefore, the total number of repetitions runs through rapidly emerging fatigue reduced to 3-4 times. V.M. Platonov [17] believes that the work of the glycolytic orientation interval duration each load should not exceed 1-2 minutes, and the duration of rest 45-90 sec. Thus the heart rate should be between 170-180 beats/ min, because the output of these parameters leads to a decrease in systolic blood volume. To perform a large volume of work running activities can be performed in series (series 3-4 with rest intervals between them 10-15 minutes). This length of time is needed for recreation rehabilitation.

Significant impact on the aerobic and anaerobic lactate productivity have special interval training, which performed a series of running loads (or batches) of a gradual decrease in the length of the interval of each subsequent run. The total length of the segment in the series can range from 400 to 1000m. Performing a series of segments with different length and different intensity of their performance allows purposefully influence the aerobic and anaerobic lactate productivity of the organism [13]. However, the application of the load regime requires compliance with the following rules: rest breaks between the segments must be such that the heart rate was reduced no more than 10-15 beats/min.

Conclusions.

During the analysis of the materials of the literature and summarize practical experiences of leading experts has been established following.

Found that the physical condition reflects the dynamic human health, which should be assessed in terms of functional and physical fitness. In the formation of physical health play a significant role aerobic and anaerobic metabolism. At the present stage of development of Ukrainian society is very acute problem of improving the physical health of male students first adulthood. The solution to this problem can be achieved by adjustment of aerobic and anaerobic performance by improving the body's mechanisms for specific adaptation to physical activity of systems that limit the aerobic and anaerobic energy supply processes.

Increase aerobic and anaerobic performance of the student body possible with running loads within the extracurricular classes, specifically while stimulating aerobic and anaerobic energy supply processes. However, the problem of optimal use of running load for the correction of aerobic and anaerobic performance of students of all ages requires further study. In particular, the scientific and methodological literature does not have reasonable recommendations for the scope and intensity of physical activity, which are used to improve aerobic and anaerobic (lactate) performance of the first young adulthood based on their level of physical fitness. Also, do not fully studied so far is the issue of effectiveness and impact on the body of students 21 - 23 years of occupation, which is traditionally carried out in accordance with state curriculum in physical education for higher education in Ukraine.

Thus, there is an urgent need for the development and implementation of health technologies based on the use of running athletics exercise during extracurricular classes, in order to improve the physical health of university students.

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Information about the author:

Serorez T.B.: ORCID: 0000-0001-9578-1345; tanya_serorez@mail.ru; Donetsk National Technical University: Artema str. 58, Donetsk, 83001, Ukraine.

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