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The development of endurance in high school skiing lessons

Abstract

Introduction: Information, innovative technologies in the sphere of human activity have greatly reduced his motor activity, as the need to engage in heavy physical labor has disappeared. This has led to a decrease in the level of human physical development, and, consequently, to the deterioration of health.

It is necessary to form the habit of physical activity in early childhood. It is necessary to pay attention to the development of such qualities as endurance, speed, flexibility, agility and strength. Teachers of physical education and sports choose special exercises and loads to develop these physical qualities according to the age of schoolchildren. One popular sport is skiing lessons. Skiing in winter has a beneficial effect on the body, as there is a hardening effect on the body.

Methods: Method used in this is description self-observation analysis and reviews, Methods of Endurance Development in High School Children in Ski Training Lessons

Results: During the experiment we saw that the selected method gave positive results. The students of 10thA class had dynamics of growth of endurance indicators, but not significantly. Consequently, it is necessary to pay attention to the development of endurance during physical education lessons.

Conclusions: Physical education classes are an important component of endurance development in high school children. Properly structured lessons provide opportunities to improve endurance. It is advisable to give endurance exercises near the end of the lesson. Initially it is necessary to give exercises for the development of general endurance, and then to develop different types of special endurance (speed, strength, etc.). It is necessary to increase the load, but gradually.

Keywords: physical education and sport, psychological and physiological qualities, school skiing lessons, endurance exercises

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Introduction

Characteristics of endurance as a physical quality

Endurance is the body's ability to resist fatigue during prolonged physical exercise.[1] The main factor influencing and at the same time limiting the ability to work is fatigue in the process of performing a motor action. A person is considered to be sufficiently enduring if he/she does not get tired so quickly or can perform a certain work in the process of fatigue.

The level of development of endurance is determined first of all by the functional abilities of the cardiovascular and nervous systems, the level of metabolic processes, and coordination of activity of different organs and systems. One of the main roles here is played by economy of functions of the body. Together with this, the coordination of movements and strength of mental, including volitional, processes have an impact on endurance.

The main criterion of endurance is the time during which muscle activity of a certain character and intensity is performed. An example of this is physical exercises in cyclic sports (walking, running, swimming, skiing, etc.), in which minimum time of overcoming a given distance is measured. In game activities and martial arts, the time during which the level of a given motor activity efficiency is performed is measured. In complex coordination activities connected with the execution of precise movements (gymnastics, figure skating, etc.) the index of endurance is the stability of technically correct execution of an action.

According to A.M. Maksimenko, the main task of endurance development in athletes consists in "creating conditions for a steady increase of general aerobic endurance on the basis of different types of motor activity, provided for mastering in the mandatory programs of physical education".[2]

Factors of functional stability allow saving activity of functional systems of an organism under unfavorable shifts in its internal environment caused by work (increase of oxygen debt, increase of lactic acid concentration in blood, etc.). A person's ability to keep the given technical and tactical parameters of activity without paying attention to the growing fatigue depends on functional stability.[3]

Means and methods of endurance education for high school children

Physical education classes use a variety of means and methods during the education of endurance of high school age children.

General preparatory, especially preparatory and competitive exercises are used as means of physical training of endurance which are divided into general (running, skiing, etc.) and local exercises (repeated raising and lowering of hands and legs) depending on the influence on the organism.

The means of developing general (aerobic) endurance are exercises which cause maximum performance of the cardiovascular system, as well as the respiratory system. Muscular work is provided by a predominantly aerobic source; the intensity of work can be moderate,

large, variable; the total duration of exercise ranges from several to tens of minutes.[4]

The level of development of general endurance is of great importance in school-age children. Schoolchildren who have high indices of general endurance, as a rule, learn general subjects better, fall ill less often during the school year, and pass control standards better. V. P. Filin believes that education of general endurance should become the most important part of general physical training.

When choosing a means for the education of general endurance in adolescents, it should be understood that it can be developed through almost all physical exercises that are included in physical education lessons, including morning exercises and active recreation.[5]

The authors believe that in the practice of physical education a wide variety of physical exercises of cyclic and acyclic nature, such as long runs, cross-country running (cross country), skiing movements, skating, cycling, swimming, games and play exercises, exercises performed according to the method of circular training (including 7-8 or more exercises performed at an average pace), etc. are used. The requirements that are imposed on them are as follows: the exercises should be performed in the zones of moderate and high-power work; their duration should be from several to tens of minutes.[6,7]

Most types of special endurance are to a great extent conditioned by the level of anaerobic capabilities of the organism, for which purpose any exercises involving the functioning of a large group of muscles and allowing to perform work with the maximum and near-total intensity are used.

Special preparatory exercises are an effective mean of developing special endurance (speed, power, coordination etc.), which are maximally approximated to competitive exercises by form, structure and peculiarities of the influence on functional systems of the organism.

To increase the anaerobic capacity of the organism the following exercises are used:

a. Exercises that help to increase lactate anaerobic capacity. Exercise duration is 10-15 s, intensity is maximal.

b. Exercises are used in the mode of repeated performance, in series.

c. Exercises which improve lactate and lactate anaerobic abilities in parallel. The duration of the exercise is 15-30 s, the intensity is 90-100% of the maximum available.

d. Exercises that improve lactate anaerobic capacity. Work duration 30-60 s, intensity 85-90% of the maximum available.

e. Exercises that improve lactate anaerobic and aerobic capabilities in parallel. Work duration 1-5 min, intensity 85-90% of the maximum available.[4]

Methods aimed at the development of endurance can be divided into: methods of developing aerobic capacity and methods of developing anaerobic capacity.

The main methods of developing general endurance are

1) the method of fusion (continuous) exercise with a load of moderate and variable intensity; 2) the method of repeated interval exercise; 3) the method of circular training; 4) the game method; 5) the competitive method.

For the development of special endurance are used:

a. methods of continuous exercise (uniform and variable);

b. methods of interval discontinuous exercise (interval and repeated);

c. competitive and game methods.

The uniform method is characterized by a continuous long mode of work with a uniform speed or effort. In this case, the student must maintain a given speed, rhythm, a constant rate, magnitude of effort, and amplitude of movement. Exercises can be performed with low, medium and maximum intensity.

An alternating method. Its main distinction from the uniform method is a sequential variation of the load in the course of a continuous exercise (for example, running) by a directed change of speed, tempo, amplitude of movements, the magnitude of efforts, etc.

The interval method involves performing exercises with standard and variable loads and with strictly dosed and pre-planned rest intervals. The rest interval between exercises is 1-3min (sometimes 15-30s). Thus, the training effect occurs not only and not so much at the moment of performance, but also during the period of rest. Such loads are usually called aerobic-anaerobic. They are effective for the development of special endurance.

The method of circuit training provides exercises affecting various muscle groups and functional systems by continuous or interval work. Usually there are 6-10 exercises ("stations") in a circle, which a sportsman performs from 1 to 3 times.

The competitive method provides exercises in the form of competitions. The intensity of exercises is maximal.

The game method involves the development of endurance in the process of the game where there are constant changes in the situation and emotionality.

When using one or another method to develop the endurance of children of high school age, specific parameters and loads are determined each time. It all depends on the individual characteristics of the body of students, as well as on their preparedness.

Analysis of program material on ski training in high schools

One of the recognized and accessible sports is skiing. The value of skiing is very important. Thanks to this type of sport has a positive impact on the body involved, are instilled vital motor skills, as well as forming the most important moral and psychological qualities of character: courage and perseverance, hard work and discipline, dedication and diligence. When moving on skis are the inclusion in the work of all muscle groups, improving respiratory function, blood circulation. A huge plus skiing - it is easy to vary the load.

Cross-country skiing and ski racing is available to people of all ages. Cross-country skiing has a beneficial effect on the nervous system and relieves fatigue.

Skiing also has an educational value. In the process of training a person acquires new knowledge, skills and abilities, which are associated with the technique of movement, hygiene, etc.

Most schools now learn from the working program "Comprehensive program of physical education students 1-11 grades" V.I. Lyakh, A.A. Zdanevich "Prosveshchenie".[8]

The school physical education program provides for ski training from 1st through 11th grade. Lessons are held in the third academic quarter in the amount of 17hours.

This program provides knowledge, skills, and abilities: students master the skills and abilities of different ways of skiing (classic and skate skiing, overcoming descents and ascents, etc.), theoretical information, development of basic physical qualities, moral and volitional qualities, as well as increasing the efficiency of the body.

Lessons on ski training in high school should primarily have an instructor focus, that is, students should be active assistants of teachers in the organization of extracurricular activities, mass sports and recreational work on skis with students in junior high. Another important component is homework, since the lessons, which are held three times a week, do not provide reinforcement of the material and maintain the necessary pace in improving the development of physical qualities.

To conduct lessons on ski training certain requirements should be observed

1) High motor density should be provided in the lesson. It is necessary to reduce the time for showing and explaining the material.

2) To increase the quality of the lesson a high emotionality is used.

3) The dynamics of the lesson on ski training, in accordance with the sex, age and preparedness of students provides the optimal volume and intensity of the load.

From class to class the training standards increase the requirements for physical fitness of students, which are expressed by lengthening the distance and reducing the time to overcome it, as well as increasing the complexity of the terrain. For example, in grade 10-11 the distance for boys is 5km, for girls 3km. The time of overcoming the distance for the "excellent" grade for boys - 26minutes, for girls - 18minutes 30seconds.

In Grade 9 the study and mastering of skiing technique ends. Consequently, in the 10th and 11th grades special attention is paid to improving the studied moves and their use in accordance with the terrain and other external conditions. Rest between exercises should be active, that is to be filled with low-intensity exercises aimed at consolidation of previously learned material. When improving the methods of movement on skis must be selected such training circles with a variety of conditions, so that the terrain stimulates a constant change of ski moves. The program provides a close relationship of lessons on ski training with extracurricular activities. Sports and mass activities should be included in the monthly health days and physical culture holidays.

Methods of endurance education in older school children at ski training lessons

Organization of the study. The study was conducted on the basis of Municipal state educational institution "*Soligalich Secondary General Education School*", located at 33a Gagarina St., Soligalich. The study involved 20 people (8 girls, 12 boys), students of grade 10A. The lessons were conducted according to the author's program.[8]

All participants of the study, according to medical examination data, belong to the main medical group. All students have approximately the same level of physical fitness.

This study was conducted during the ski training period (January-February 2021). The following control tests were selected for the study:

a. To test the development of general endurance, the result of cross-country skiing was used (boys - 5km, girls - 3km)

b. To test the development of speed endurance we used sprint on skis (boys - 600m, girls - 400m).

c. To test the development of power endurance we used the results of control test - raising the body from the supine position for 1minute.

Cross-country skiing for 3km and 5km. The style of movement - free. Held at a distance laid mainly on the terrain with weak or medium rugged terrain. Competitions are held at temperatures ranging from -3 degrees Celsius to -12 degrees Celsius.

Sprinter cross-country skiing 400m and 600m. The style of movement - classical. Conducted at a distance laid mainly on the terrain with slightly to moderately rugged terrain. The result is recorded with a stopwatch with an accuracy of 0.1 s.

To determine the strength of the trunk flexor muscles, a control test is used such as raising the trunk from the supine position for 1 minute. The exercise is performed on a gymnastic mat. Starting position is lying on the back, legs bent at 90 degrees, hands behind the head, fingers interlocked. The partner fixes the test person's feet to the floor. At the command "March!" the examinee should bend until his elbows touch the knees and return to the starting position with the opposite movement. During the performance, it is forbidden to unhook hands behind the head. The number of times performed in 1minute is counted.

Control tests were conducted at the beginning of the ski training block (January) and at the end of the block (February). Each test was preceded by a briefing on its performance, as well as a safety briefing.

Ski training lessons in the 10th grade are aimed at the development of endurance. The lessons were conducted three days a week for 40minutes. In February the lessons were paired (90minutes) and were held on the ski track.

The lesson consisted of 3 parts

1. The preparatory part. Warming up on skis, preparatory exercises.

2. the main part. The duration is 20minutes.

3. Final part, Duration of 10minutes. There were movement games for the development of endurance, relay races.[1]

Air temperature in February was below -15°C, and, therefore, holding ski training lessons was prohibited by the temperature regulations. At this time classes were held in the gym and were aimed at the development of physical qualities, in particular strength endurance.

To develop endurance and improve the body's capabilities we used methods of continuous standardized exercise - the duration of the exercise was 20-30 min for physically weakly prepared children. The optimal duration of continuous exercise should be approached gradually, because fatigue depends on the intensity, not on the duration of the load. It is advisable to start classes with a dosed load. Gradually increase the load to the optimal duration. Having reached the necessary duration of the load, gradually increase its intensity to the optimal level. In work with physically moderate and well-prepared pupils it is necessary to apply methods of continuous variation and progressive exercise.[9]

Correct selection of the means and methods used by us, contributed to the improvement of general, speed and strength abilities of schoolchildren.

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Evaluation of the effectiveness of the methodology of endurance development in high school age children in ski training lessons

Before the experiment began, control tests were conducted to determine the level of general, speed and power endurance. At the beginning of the experiment, the girls' results for the 3km distance were 19.2±0.21minutes, and the boys' results for the 5km distance were 27.1±0.17minutes. By the end of the section "Ski training" both girls and boys had decreased, but not significantly (girls - 18,55 ±0,16 minutes, boys - 26,5±0,11 minutes) (Figure 1).

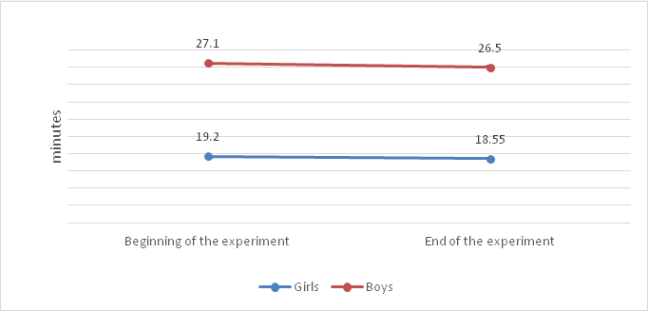

Figure 1 Results of the control test "Skiing 3 km and 5 km".

To determine the speed endurance, we chose the test "Sprint Ski Run 400m and 600m". The stability of the results is observed, that is, the girls at the beginning of the experiment the result in 400m - 3.47±0.12 minutes, at the end of the experiment - 3.44±0.9minutes, the boys in 600m before the experiment - 3.11±0.07 minutes, at the end of the experiment - 3.02±0.05minutes (Figure 2).

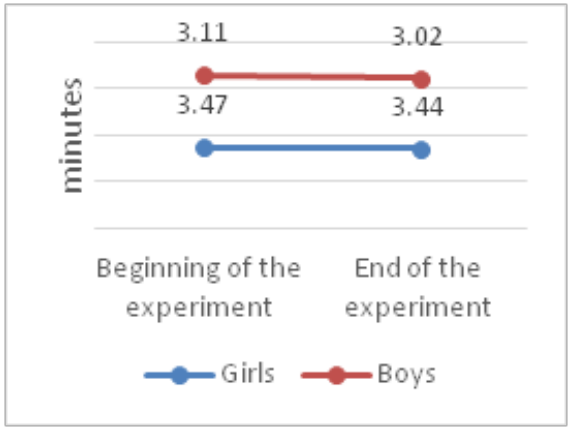

Figure 2 Results of the control test "Sprint skiing 400 m and 600 m".

As the results of observations at the end of the experiment showed an increase in the results of girls from 40±3 times for 1minute to 45±2 times. The results of young men also increased from 50±4 times to 54±3 times (Figure 3).

Analysis of the results of each test showed an increase in endurance indicators, but not a significant one, because the duration of the study was only two months, therefore, it did not allow us to achieve significant changes in the development of endurance in students. But if we look from the other side, there were positive changes. Students mastered the exercises for the development of endurance types from the proposed methodology.

The selected exercises for increasing the level of endurance made it possible to diversify the educational material.

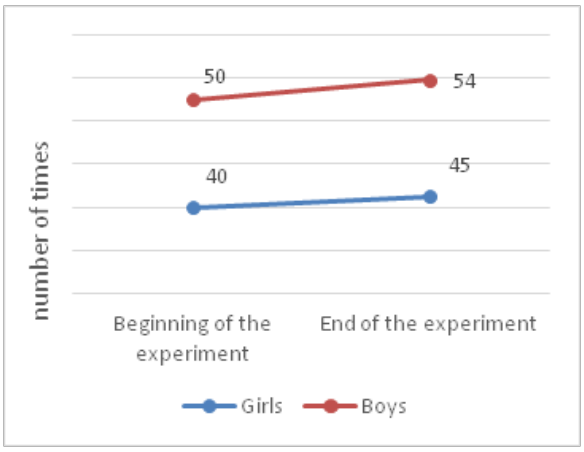

Figure 3 Results of the control test "Raising the body from a supine position in 1 minute"

Conclusion

During the study the literature on the topic "Development of endurance in ski training lessons for children of high school age" was studied. After the analysis we can make the following conclusions:

Endurance is one of the important human qualities. Thanks to it a person can perform work at the "limit" of his abilities. Modern practice distinguishes between general and special endurance.

It is advisable to use the influence aimed at endurance education exactly at the age periods of its rapid development. Appropriately selected means and methods yield positive results in the development of physical qualities. It is necessary to remember that endurance in children of high school age is very important. It is such a physical quality as endurance that helps to prevent fatigue during exercise. At the age of 16-18years the foundation of endurance is laid, which is necessary for further achievement of high results.

Exercise is the primary means of developing endurance

Methods which are used for the development of general and special endurance in the process of physical education of children of older school age may be divided into several groups: fusion (continuous) exercise (equal and alternating), method of circular training, game and competitive methods. Each of these methods has its own characteristics and is used to develop different types of endurance by changing the parameters of the exercises used. If we change the number of repetitions, the intensity of execution, the time of work, and the interval and type of rest, the physiological load of the work performed changes.

So the goals and tasks of the work have been achieved. It is possible to conclude that teachers of physical culture should develop physical qualities of children at lessons, the special attention should be paid to endurance.

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Conflicts of interest

The authors declare no conflict of interest. The authors are responsible for the content and writing of the article.

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