



Features of physical training of students of a special medical group in the conditions of a streaming form of education

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Abstract

Objective of the study was to develop and test the methodology of physical training of students of a special medical group, taking into account their characteristics in the conditions of streaming training.

Methods and structure of the study. During the experiment, the proportion of SHG students from the total number of students was determined. The diseases of students were identified, and then grouped according to nosological groups (dis-eases of the cardiovascular system, musculoskeletal system, etc.). On the basis of the data obtained, a methodological approach was developed for working with students of the SMG. The study was conducted at the department of "Physical Education" of the Bauman Moscow State Technical University.

Results and conclusions. A methodology for practicing health-improving swimming with students with musculoskeletal disorders, cardiovascular diseases and eye diseases (more than 70% of the total SMG contingent) has been developed and tested, which is based on swimming with phased training. The technique consists in fifteen weeks of swimming training, with a gradual soft increase in loads and a phased learning of swimming techniques. The optimal intervals of rest and work in the water were determined separately for students with diseases of the cardiovascular system, separately for those studying with diseases of the musculoskeletal system, and separately for students with eye diseases.

Keywords: *special medical group, physical education, health-improving swimming, swimming for SMG, students' diseases, students' contingent.*

Introduction. Physical education classes are contraindicated for people assigned to a special medical group of type "B", but students of type "A" SMG undergo a full course of physical education at their university. The contingent of students assigned to a special medical group (SMG), as noted by many authors [1, 3, 4], is growing, including our data allow us to draw the same conclusion. Obviously, when working with students of this category, a careful approach is required in choosing the means and methods of work. In this case, it is important to maintain a balance between the load, which can be harmful due to too high requirements for a conditionally unhealthy organism, and reducing the load to a level that does not positively affect the body of young people.

Another of the main problems in working with students of the special medical group (SMG) is the flow of education. Under the conditions of the modern sys-

tem of physical education, it is practically impossible to unite students according to nosological groups for physical education, to work with each group of diseases pointwise. The main obstacles to this are: the university schedule (different academic groups have a different number of students with a particular disease), different incidence of diseases by nosological groups (the predominance of some groups of diseases over others). The question arises about the search and development of approaches when working with SHG students that allow combining methods and tools that have a healing effect for the largest possible number of SMG students with the most common diseases, without the need to form separate nosological groups.

Objective of the study was to develop and test the methodology of physical training of students of a special medical group, taking into account their characteristics in the conditions of streaming training.



Methods and structure of the study. At the first stages of the experiment, the collection and analysis of data on diseases of students of a special medical group was carried out. The proportion of SMG students from the total number of students was determined. Students' diseases were identified, and then grouped according to nosological groups (diseases of the cardiovascular system, musculoskeletal system, etc.). Students with concomitant diseases, in addition to the main one, were identified, they were also referred to the nosological group.

In the course of the study, an analysis of scientific and methodological works was carried out on the issues of improving the health of students with deviations in the state of health [3, 4, 5], and we also considered various methods of health-improving swimming [1, 2]. Based on the data obtained, a methodological approach was developed for working with SMG students. The pedagogical experiment was carried out at the department of "Physical Education" of the Bauman Moscow State Technical University.

Results of the study and their discussion.

The data on the ratio of SMG students to the general contingent of 1st-3rd year students of the Bauman Moscow State Technical University from 2015-2016 to 2017-18 academic year. So, in 2015-2016 11969 students accounted for 1523 students of the SMG,

which amounted to 12.7%, and in 2017-18 there are already 2708 SMG students out of 15507, which is 17.5%. As we can see, there is a certain increase (by 4.8 percentage points), mainly, the growth was facilitated by those who entered the 1st year in 2016 and 2017, it is worth noting that an increase of 4.8 percentage points cannot be considered significant. Nevertheless, there is obviously no positive dynamics. The main task when working with this contingent is not a medical, but a general health-improving orientation of classes.

In his study, Ivanov K.V. [1] gives the following data: deviations in the state of the cardiovascular system - 56%, CNS (central nervous system) - 61%, musculoskeletal system - 69%, and the digestive system - 56%. We also analyzed the data on the diseases of students of the SMG groups of the Bauman Moscow State Technical University. The study involved 1523 people (2015-2016) and 2708 (2017-2018) students of the SMG 1-3 courses.

In table 1 shows the statistics of diseases among students in different years of study:

When counting, students with a number of diseases from different groups were taken into account exactly as many times as they have diseases (for example, if 1 student has diseases associated with musculoskeletal system and cardiovascular system, then in the table it

Table 1. Diseases of SMG students

Disease groups	2015-2016 academic year	2017-2018 academic year
Eye diseases	19,7%	21,8%
Respiratory diseases	8,8%	10,54%
Urinary system disease	5,4%	3,16%
Diseases of the digestive system	6,7%	5,27%
Cardiovascular diseases	31,2%	26,05%
Diseases and injuries of the musculoskeletal system	18%	37,65%
Hearing loss	8,1%	3,16%
Other diseases	2-3%	10,5%
Total number of students (persons)	1523	2708

Table 2. Students with one, two or three or more diseases in the SMG

Total number of SMGs (students)	1 disease	2 or more diseases	3 or more diseases
2708	60,88%	31,03%	8,09%

Table 3. Exhalations into the water and rest intervals by nosological groups

Disease	Number of breaths (times)	Rest intervals (min.)
Cardiovascular system	15-20	5-8
Musculoskeletal system	7-8	3-4
Vision	10-15	4-6



is reflected twice and in the column musculoskeletal system and cardiovascular system).

Table 2 presents the data with the differentiation of students by the number of diseases according to the data for the 2017-18 academic year.

These data point to the urgent need to find approaches when working with SMG students with diseases of the cardiovascular system, musculoskeletal system and eyes. Also, based on the data presented in Table 2, more than 30% of SMG students cannot be attributed to a specific nosological group, which, in turn, also sets us the task of developing methods suitable for the majority of students with a special medical health group. For this purpose, we have developed and tested a swimming methodology with stage-by-stage training as one of the approaches that allows us to cover the largest contingent of SMGs. Of course, it is worth noting that for a number of diseases this approach will be contraindicated (mostly students with diseases of the respiratory and genitourinary systems, as well as those who are allergic to bleach, etc.), however, the proportion of such students in SHG groups in general not high (13-15%).

In his dissertation work, O.A. Melnikova [4] showed the effectiveness of swimming for students with connective tissue dysplasia. At the same time, we believe that swimming can be useful not only for students with connective tissue dysplasia, but also for the majority of SHG students admitted to classes in the pool. In order to improve the quality of work in the development of a methodology as an approach when working with SMG, we paid special attention to the following points:

1. Choice of starting positions;
2. Gradual load increase with heart rate control;
3. Individualization of rest intervals according to nosological groups;
4. Repeatability, pace and rhythm and amplitude of movements;
5. Accuracy of movements;
6. The degree of effort when performing physical exercises;
7. Use of breathing exercises.

The method of step-by-step training in swimming consisted of three stages, at each of which specific tasks were set and solved, depending on which the means, methods and methods of training were chosen.

The total duration of swimming lessons was 72 practical lessons during the year, twice a week, in compliance with the generally accepted structure of the lesson (preparatory, main and final part). Exercises were selected for mastering the techniques of sports swimming.

At the first, preparatory stage, during three lessons, the main features, the type of their constitution, the "bouquet" of diseases, the level of the students' ability to swim were determined. Based on the collected data, the swimming style that is most suitable for a particular student was determined.

Swimming technique training was carried out on the basis of three main groups of physical exercises:

- preparatory exercises designed to help at the initial stages of training to get used to the mode of operation, prepare for learning swimming techniques and adapt to work in the aquatic environment;
- general developmental physical exercises aimed at improving the coordination of movements, increasing the functionality of the cardiovascular system and the overall development of the musculoskeletal system (skeletal muscles, increasing the elasticity of ligaments and tendons, etc.);
- special exercises aimed, here, mainly at the correct setting of breathing, teaching the technique and methodology of breathing exercises in water.

Research N.N. Kardamonova [2] proved that the use of such exercises can increase the functionality of the body, as well as improve special endurance. For students, especially students of a special medical group, such exercises at the initial stage are an additional burden on the cardiovascular system. Under these conditions, it was necessary to choose the intervals of rest between the work performed, so that the subsequent work took place against the backdrop of favorable changes after the previous work. Based on our experience, analysis of the literature [1, 4] and data obtained while working with students, it is certain that the number of exhalations into the water can vary from 5 to 15, depending on the level of preparedness of students and their diseases. Thus, students with cardiovascular system problems must perform more breaths to recover, and university students with problems with the musculoskeletal system need only seven or eight breaths into the water (Table 3).

The main task that was solved when using these exercises was to reduce heart rate by 30% or more. In subsequent sessions, rest intervals remained at the same level, while the duration of work in each segment gradually increased.

Conclusions. According to the results of the study, it was revealed that more than 90% of students studying according to the developed methodology noted a general improvement in their physical condition. 96% of those involved improved their results in terms of the amount of distance they swam without stopping. On



average, the increase was 110-120% (from 400-500 m to 900-1000 m).

The approved method of staged swimming for SMG students with diseases of the cardiovascular system, musculoskeletal system and vision has shown its effectiveness.

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