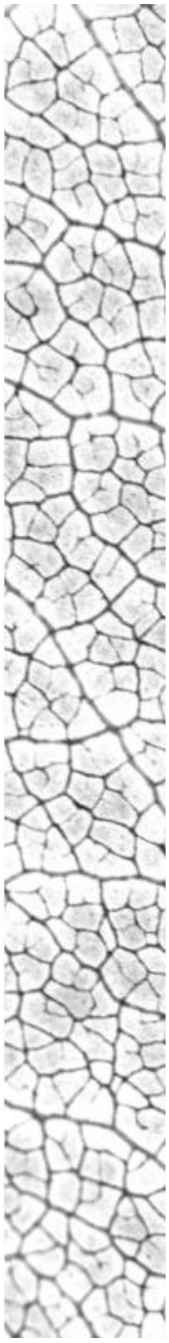

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Usage of health-saving technologies in the context of distance learning in physical education lessons

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Abstract
Purpose: This article discusses the problem of using health-saving technologies in the context of distance learning, with limited instrumental capabilities. The aim is to develop health-saving technologies for middle-grade students, to maintain their level of health, prevent physical inactivity, as well as maintain and improve physical development. Methodology: The leading research approaches to the usage of health-saving technologies are: structural-analytical, personality-oriented and cultural approaches. Research methods are scientific and methodical literature analysis and summarizing, questionnaires, pedagogical testing, pedagogical experiment and methods of mathematical statistics. Results: The article presents the results of applying the developed system of health-saving technologies aimed at secondary school students. The features of the usage of the health preservation system in the conditions of distance learning were also revealed. The results are presented and discussed, proving the effectiveness of the use of health-saving technologies for schoolchildren in the context of distance learning. Applications: The article will be useful for PE teachers during the period when a class or school is closed for quarantine, or when switching to a distance learning format. The students whose goal is to prevent hypodynamia, improve their general physical condition and strengthen immunity. The developed system of health preservation will also be useful in the system of additional professional education for fitness instructors and coaches. Novelty/Originality: The novelty of the author's research lies in the usage of the health preservation system in the conditions of distance learning, where students do not have a sufficient amount of equipment and space to conduct a full-fledged lesson in physical culture. In the development of a health care system, covering three components of health: physical, mental and social.

Keywords: distance learning format, middle-grade students, health preservation system, health components, prevention of physical inactivity

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INTRODUCTION

In modern society the problem of preserving and improving health, as well as the prevention of hypodynamia in conditions of distance learning, has acquired a special preschool relevance due to the pandemic, because educational institutions are switching to a distance learning format and conducting classes in a traditional format is impossible. The health of students, due to insufficient physical activity, tends to decrease. Hypodynamia develops especially strongly as a result of spending a long time at the computer while studying. Many researchers and scientists have dealt with the problems of introducing health-saving technologies in a distance learning format. N.I. Gorodetskaya (2008), who notes that in the distance learning format, the widespread use of health-saving technologies involves not only improving the selection of the content of educational material, but also the methods and organizational forms of distance work with students. The health-preserving educational technologies can be understoond the essence of all the formation of those technologies, the use of which by a person in the state of the educational process the motive goes to the head of the health benefits of having students (Novikova et al., 2020). If the factors of culture are associated with the solution of a narrower health-preserving task, then the environment will include teachers, pedagogical techniques, factors, methods, technologies, health-preserving that do not directly harm the younger ones or indirectly harm the health of the students and teachers,

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provide them with a safe plan conditions for the way of stay, study and work experience in the educational condition formation. All these educational technologies are interconnected in a single implementation of the system of work of the existing school for health preservation and health promotion (Ivanova et al., 2019b; Kaletina et al., 2020).

Thus, all the activity used in the lesson by the teacher of technology, pedagogical teaching techniques, can be assessed healthy by the criterion of their impact on the health of students. Authors T.V. Zausailova, I.A. Izvekova and A.N. Petukhov (2015) in their works on the effectiveness of the use of health-saving technologies in physical culture lessons noted their high importance for students and the need to include them in a lesson conducted in a distance format.

Health-saving educational technologies are many of the familiar options for most teachers of psycho-pedagogical guided techniques and methods of work, technology, life approaches to the implementation of making possible problems, and the constant desire of the teacher's reality itself for self-improvement. The work of a school aimed at preserving and improving students' health can only be considered the appearance of full-fledged and effective teachers, when health-preserving and health-forming technologies are implemented in full production, professionally and in the lessons of a single system (Dmitrieva et al., 2019).

There is also a huge number of authors confirming the need for introducing health-saving technologies into the educational process in a distance learning format, for example N.V. Tretyakov (2014), N.K. Smirnov (2006), V.V. Tarakanova and N.G. Solovyova (2011).

Thus, the problems of the research are how to preserve and simprove health, increase the level of physical development, and contribute to the prevention of hypodynamia in the conditions of distance learning with limited tools for students with the help of a health preservation system (Tarakanova & Solovyova, 2011).

The aim of the study is to develop health-saving technologies for middle-grade students, to maintain and their level of health, prevent physical inactivity, as well as maintain and improve physical development.

LITERATURE REVIEW

Distance learning is "a set of technologies that ensure the delivery of the studied material to the learners, the interactive interaction of learners and teachers in the learning process, providing learners with the opportunity to independently work to master the material being studied, as well as in the learning process (Smirnov, 2006)."

Distance learning has several advantages:

- distance learning provides an opportunity to get much more information that allows you to evaluate the knowledge, skills and abilities obtained as a result of distance learning.
- conducting training for students with disabilities.
- the use of modern information technologies in distance learning allows you to build an effective learning management system based on the ability to collect much more information about the passing of training by a student of distance learning in comparison with traditional full-time education.
- -the ability to use an unlimited number of sources of information. The means of new information technologies provide students with a variety of modern teaching aids.

In addition to traditional study guides and abstracts, students can be offered:

- computer training programs;
- electronic teaching guides;
- computer systems for testing and control of knowledge;
- electronic directories;
- educational audio and video materials;
- information materials.

But apart from the advantages, distance learning also has significant disadvantages. The main one is the deterioration in the health of students (Tatarinov & Belaventseva, 2020).

Distance learning technologies are one of the topical innovations in Russian education.

Distance learning is being introduced today everywhere and at all levels of education. Distance learning provides the delivery of the studied material to the learners, the interactive interaction of the learners and the teacher in the learning process, and the provision of the learners with the opportunity to work independently to master the new material.

The use of distance learning technologies activates cognitive activity, stimulates self-education and self-development. Distance learning is based on distance learning. In addition to a textbook, pen and notebook, such a lesson requires the use of a computer (Gryaznova et al., 2020).

In the context of distance learning, health problems are becoming more acute. Factors that have a negative impact on the health of students:

- cramped posture, sitting position for a long time;
- eye fatigue, stress on vision;
- overload of the joints of the hands;
- stress when losing information.

During lessons, you need to evenly distribute the tasks so as not to overwork the students. The time spent at the computer should not exceed the permissible limits. Conduct distance learning, taking into account the individual characteristics and psychophysical capabilities of students. Combine collaborative learning and independent learning (Malushko & Lizunkov, 2020).

Table 1. Standards for grade 7 for physical education testing

Exercises	Boys			Girls		
	5	4	3	5	4	3
Flexion and extension of the arms in the lying position	23	18	13	18	12	8
Raising the body from a supine position (in 1 min)	45	40	35	38	33	25
Bending forward from a sitting position	11	7	4	16	13	9

Table 2. Health-saving technology for students

Health-saving criteria	Characteristic
Hygienic conditions at home.	The room temperature should be comfortable. Fresh air must be supplied. The lighting should be soft. When reading and writing, it is necessary to provide additional light, which will fall on the notebook, books, etc. There should be no distracting sound stimuli.
Duration of the lesson.	According to the curriculum, the number of hours per week in grades 7-8 is 18 hours. The duration of the lesson in the middle and senior levels is 45 minutes, breaks are 15 minutes.
Average duration and frequency of alternation of activities	The approximate norm is 7-10 minutes.
The number of educational activities used by the teacher.	It is possible to use 4-7 types for a distance lesson. The monotony of the lesson does not increase the student's interest in the distance learning process, but it must be remembered that the frequent change from one activity to another requires additional adaptation efforts from the students. It also contributes to increased fatigue.
Location of the computer during class.	The monitor should be located at a distance of 50 cm or arm's length. With excellent vision, the screen should be 70 cm away.
Minute of physical education.	General developmental exercises.
Exercises for the eyes.	Every 1.5-2 hours, you need to take a break from the computer screen and do a few simple eye exercises.
Students' poses and their alternation.	Correct seating of the student, changing activities requires a change in posture.
Favorable psychological climate.	The charge of positive emotions received by the student and the teacher himself determines the positive impact on health.
Emotional release in the classroom.	Smiling, musical minute, pictures.
The pace and features of the end of the lesson.	The end of the lesson should have been calm so that the students had the opportunity to ask questions to the teacher. So that the teacher can comment on the homework assignment, praise for the work in the lesson.

The task of practical implementation in the distance educational process of pedagogical technologies, not only saving the health of participants in the educational process from the adverse effects of the factors of the educational environment based on telecommunications, but also contributing to the education of a culture of health, is extremely important. The studies carried out as part of the implementation of the first experimental courses of distance professional development of educational workers in the Nizhny Novgorod region made it possible to identify the significance and priority of solving the problems of health preservation of all participants in the educational process (Samerkhanova & Balakin, 2020).

Thus, defining the goals and objectives of the educational activity of a distance learning teacher on the implementation of health-saving technologies in the distance educational process, the following areas of work can be distinguished:

- to promote the preservation of the health of students;
- provide students with the necessary information to form their own strategies and technologies that allow them to maintain health in distance learning activities;
- to promote the introduction of various models of activities aimed at strengthening the health of students in the context of a distance educational process.

METHODOLOGICAL FRAMEWORK

Within the framework of this study, the following research methods were developed.

The analysis of the literature on the topic of the research was carried out in order to study in detail health-saving technologies for their further usage in distance learning of schoolchildren. Analysis of scientific and methodological sources made it possible to get a relatively complete picture of the state of the issue under study (Bystritskaya et al., 2020).

The assessment of the level of physical abilities of 7th grade students was carried out using testing. We used the following tests:

1) Flexion and extension of the arms in the lying position.
2) Raising the body from a supine position.
3) Bending forward from a sitting position.

Based on the results of the questionnaires, we concluded that the mental and physical condition of 7th grade students has significantly deteriorated. In this regard, we have designed a technology aimed at preserving the physical and psychological health of students who are on distance learning.

The technology included:

- hygienic component
- physical
- psychological.

A pedagogical experiment is carried out to determine the effectiveness of the use of certain experimental means and teaching methods.

The experiment was carried out at school №135 in Nizhny Novgorod, with 7th grade students. The research involved 2 classes of students.

In the training program of the experimental group of grade 7A, a technology was applied that promotes health preservation in conditions of distance learning. Also, the students of the experimental group were offered online classes that include elements of aerobics, gymnastics.

Table 3. Training program adapted for the home

№ Training session number	Content
1.Gymnastics	1) Warm up: jumping rope -jumping on the right / left leg, -jumping up, legs together, -back and forth, - jumps with overlapping shins -with pulling the knees to the chest. -general exercises without a subject, -bends into the crease of the legs together and apart. 2) The main part-мост, -stand on shoulder blades, -equilibrium. 3) Exercises for general physical preparedness - lifting the torso from a supine position (boys 50, girls 40 times), - lifting the torso while lying on the stomach, hands behind the head (boys 50, girls 40 times), - flexion of the extension of the arms in the lying position (boys 20, girls 15) squats (boys 50, girls 40). -exercises for relaxation.
2.Aerobics	1) Jumping warm-up -jumping up, legs together, -jumping legs apart / together, -jump with an overwhelming leg, -jump into grouping, - jumping from the support by crouching, -jump with a turn of 360 degrees. 2) The main part - learning the basic steps, -connection in a dance bunch 3) Stretching - slopes, - drops, -bends into the folds of the legs together and apart.
3.Strength training	1) Warm up jogging in place for 3 minutes -general exercises. 2) The main part -lips with weights in the hands 4 * 10 (for each leg) -squats with weights 4 * 10 push-ups in the back support 4 * 8 - abduction of hands with weights 4 * 8 - lifting the torso lying on the stomach 4 * 12 - “Book” 4 * 12 -plane 4 * 15 3) Stretching - slopes, -types.

RESULTS

In the conditions of distance learning, the physical activity of schoolchildren significantly decreased, and a sedentary lifestyle began to prevail. Based on the results of the questionnaires, we concluded that most of the 7th grade students have deterioration in their physical and psychological state of health. In this regard, we have developed a health-saving technology.

We have also developed a training program that includes elements of gymnastics, aerobics and strength fitness. Classes are designed for 3 times a week. The number of approaches, repetitions is added every week.

Then, we conducted a stating experiment to determine the initial level of physical abilities of 7th grade students. The results are shown in **Fig. 1**.

The result in the test “Flexion and extension of the arms in the lying position” at the beginning of the study in the subjects was 14 times (**Fig. 1**). High level is 22 times.

The result in the test “Raising the trunk from a supine position” showed a value of 33 times per minute. The high level corresponds to a value of 40 times per minute.

The result in the test “Forward bending from a sitting position” at the beginning of the study was 9 cm. The high level corresponds to a value of 13 cm.

The obtained research results after statistical processing indicate a low level of physical abilities among 7th grade students.

Thus, as a result of the ascertaining experiment, it was revealed that the indicators of the physical abilities of the majority of 7th grade students are at a low level, which is confirmed by the research results.

The next stage of the study was a formative experiment, the purpose of which was to substantiate the effectiveness of the proposed training program for the development of physical abilities of students in the conditions of distance learning.

So, as a result of introducing a training program for 7th grade into the distance learning process, at the end of the experiment, we revealed significant differences in the studied indicators of physical abilities between the control and experimental groups (**Table 4**).

At the end of the study, the result in the test “Flexion and extension of the arms in the lying position” in the control group was 14 ± 0.84, in the experimental group was 20 ± 0.88, the differences are significant, ($p \leq 0.05$)

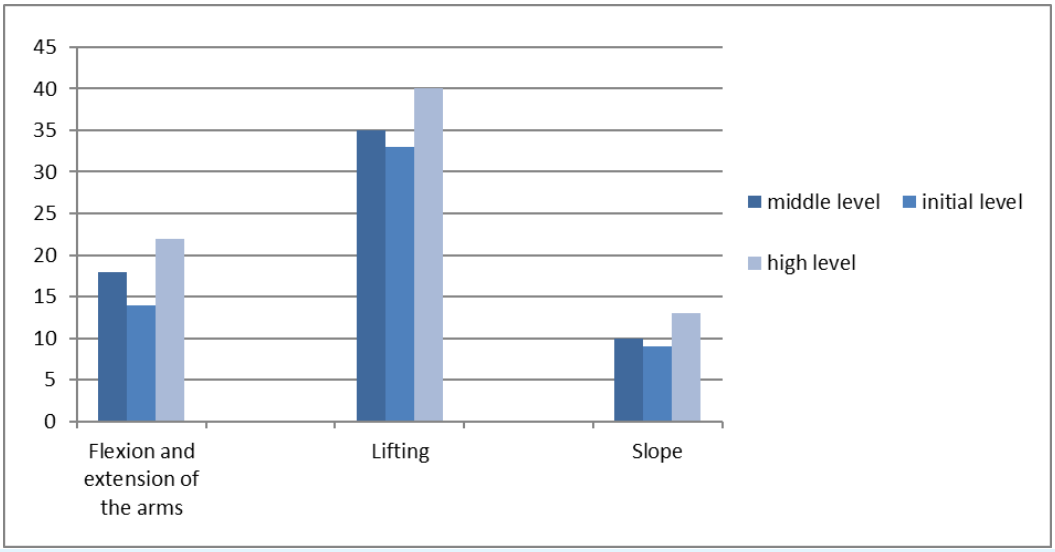

Fig. 1. The initial level of physical abilities of students in grade 7

Table 4. Indicators of the development of physical abilities in the control and experimental groups at the end of the experiment

Indicators	Control group n=20	Experimental group n=20	Validity of differences p≤0,05
Flexion and extension of the arms in the lying position	14±0.84	20±0.88	p≤0,05
Raising the torso from a prone position	20±0.88	40±1.39	p≤0,05
Bending forward from a sitting position	9±0,33	12±0.37	p≤0,05

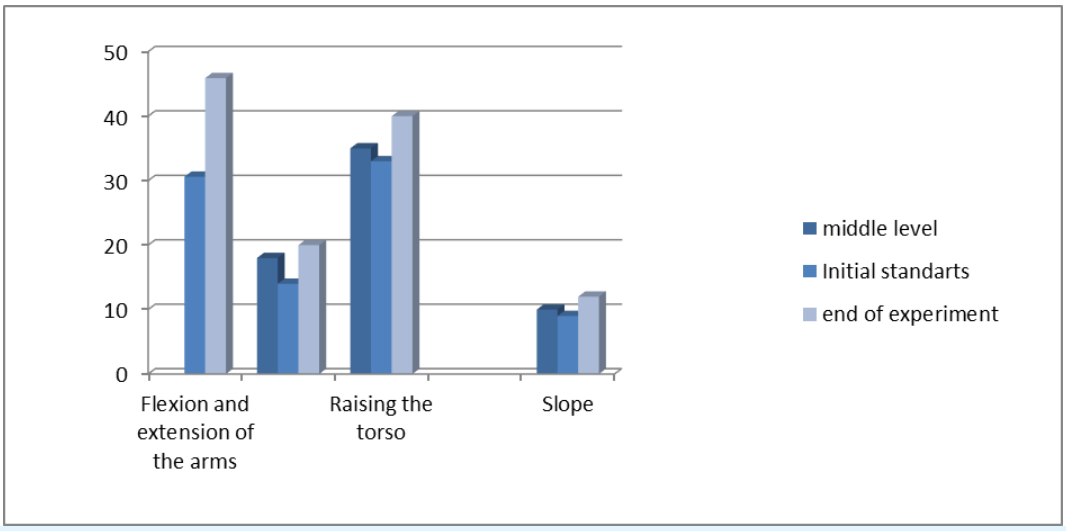

Fig. 2. Dynamics of changes in indecators of physical abilities in experimental group

At the end of the study, the result in the test “Raising the trunk from a lying position” in the control group was 20 ± 0.88, in the experimental group was 40 ± 1.39, the differences are significant, (p≤0.05)

At the end of the study, the result in the test “Forward bend from a sitting position” in the control group was 9 ± 0.33, in the experimental group was 12 ± 0.37, the differences are significant, (p≤0.05)

The results allow us to assert that the use of the proposed program in the experimental group made it possible to increase the level of development of physical abilities in conditions of distance learning.

The study of the dynamics of changes in the indicators of physical abilities in the experimental group also testifies to the effectiveness of the proposed means during the experiment (**Fig. 2**).

Thus, the results obtained at the end of the experiment in the control and experimental groups allow us to conclude that the use of the proposed program with the use of aerobics, gymnastics and strength fitness in the 7th grade contributes to an increase in the level of development of physical abilities.

DISCUSSIONS

Based on the monitoring of the available information portals on a healthy lifestyle and identifying the needs of adults, the following conclusions were obtained:

- The main need for the formation of a healthy lifestyle is available reliable information, taking into account physical, mental and social characteristics
- Substantive components should reflect their essence in a simple form
- When designing such information resources, it is necessary to take into account the needs of the persons for whom the resource is being developed.

In our opinion, it is the health-improving orientation of a healthy lifestyle in combination with innovative technologies that will make it possible to achieve the expected result: to form a need for new types of motor actions, communication with an interested circle of people, familiarizing with previously unknown sports, developing a habit of caring for one's body, the level of physical fitness, to become more psychologically stable, as well as to adapt to the rapidly changing conditions of modern society (Ivanova et al., 2019a).

The monitoring of the available information resources on the healthy lifestyle of adults was carried out very thoroughly, the goal was achieved, the tasks were solved, the reliability of the working hypothesis was proved.

CONCLUSION

The authors have identified effective health-saving technologies for implementation in the educational process in the distance learning system. Exercises, methods of technology are chosen that are most successfully applied and adapted to students of school. Also, in this work, with the help of scientific literature, we analyzed what health and health-saving technologies are in terms of distance learning for schoolchildren (Grigorieva et al., 2019).

On the basis of scientific and methodological literature, we have compiled a technology aimed at preserving the physical and psychological health of students at home. And also we have developed a training program that includes elements of aerobics, gymnastics and strength fitness. These complexes were used in the experimental group during the entire last quarter.

At the end of the experiment, based on the data obtained, we concluded that the complex on physical culture and health-saving technology were compiled correctly.

1. For a detailed study of the research topic, the scientific and methodological literature was analyzed.

2. In the course of the research, a questionnaire was conducted and, based on the results, a technology was developed to preserve the health of students in the process of distance learning. And also a program of physical education classes was developed in order to improve physical abilities.

3. As a result of the pedagogical experiment, the effectiveness of the proposed technology was revealed. At the end of the experiment, we found significant differences in the level of development of physical abilities between the control and experimental groups.

RECOMMENDATIONS

Possession of knowledge about the development and inclusion in the distance learning format of health-saving will increase the effectiveness of a specialist in the field of physical culture, who in his future professional activity will meet with a similar format of education.

Also, this knowledge in their work can be used by teachers of universities, implementing the implementation of physical education and health and sports mass work for students with the selection of means and methods based on the age and individual characteristics of students. This information is useful for teachers of advanced training courses who are designed to quickly respond with the content of their activities to the needs of teachers for work in a distance format.

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