

## THE USE OF WAVE GYMNASTICS TO INCREASE THE LEVEL OF HEALTH OF STUDENTS

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The use of innovative means in the process of physical education of higher education students, on the one hand, should not make it difficult to organize training sessions, and on the other, the use of new methods and means of their implementation designed to improve the efficiency of the process of formation and preservation of students' health. In this context, we have experimentally established that the correction of previously used techniques of using Agashin simulators significantly enhances the effects of biomechanical resonance provided by wave mechanical action. At the same time, using exercises of a cyclic nature, it is possible to achieve a more pronounced effect of coordination and normalization of the processes of functioning of various systems of the human body (respiratory, cardiovascular, etc.)

**Keywords:** *wave gymnastics, physical education, health of students.*

**Urgency.** Studies of morbidity among students indicate that in the first place are diseases of the cardiovascular system in recent years, the second — the musculoskeletal system (osteochondrosis, scoliosis, etc.), the third — the respiratory system, diseases of the body, the most important for life [6; 7; 10].

Analysis of the functional state of the body of students showed that the level of their health is characterized by statistical indicators that cause serious concern. Thus, in the Chelyabinsk region, only 7.8 % of students had a high level, average — 27.7 %, low — 31.5 %, very low — 33.0 % [6; 7].

According to some authors [5; 6; 7] such dynamics is due to the low level of physical health of school graduates, their lack of formed value orientations to maintain and strengthen health, lack of motor activity in the framework of educational programs, extremely weak focus on the formation and development of activity, independence and individuality of students, their various abilities and inclinations. This requires a significant update of physical education, physical education and sports training at the University. Such updating should go in the directions of increase of reserves of health, formation of readiness of students for the current educational and future professional activity.

It is important to note that "...innovations in the system of physical education can solve the problem of improving physical education programs without radical breaking of existing methods and forms of training..." [9. P. 66]. This allows to actualize different means of training physical qualities of students [5; 6; 8].

Exercises on the Agashin simulator allow simple natural movements with minimal effort, easily and rhythmically, 2–5 times per second, to cause light wave

contractions of almost all skeletal muscles in the mode of stress change and relaxation, which harmonizes and normalizes the state of human systems and organs [1–3]. Each movement of the arms, legs or body creates a mechanical wave of tension-relaxation, tangible in all parts of the body, gently affecting all tissues of the body [3; 4]. Therefore, the theoretical justification and experimental verification of the effectiveness of the use of the Agashin simulator and wave gymnastics exercises with the use of biomechanical simulators in the classroom for physical education of students in the University environment is relevant and timely.

**Methods and organization of research.** As additional funds to the classes of corrective gymnastics for the discipline "Applied and improving physical culture", we used a simulator of Agashin, representing the wave of the biomechanical simulator, structurally consisting of a hollow cylinder with a length of 80 cm and a diameter of 5 cm placed inside a rod, along which move the springs with the load. In fact, they create a mechanical wave that spreads through the hands throughout the body and initiates the creation of human rhythmic movements in the human simulator system, certified as a therapeutic agent in 2002.. Designed for drug-free treatment and prevention of diseases of the cardiovascular (CCC), neuromuscular (NMS) and respiratory systems and musculoskeletal system (ODE). The simulator is effective for all age groups engaged in physical culture, because it organizes the correct work of the CCC, NMS and respiratory systems and maintains this state for a long time.

We have developed a program of training in special medical groups using the Agashin simulator. It was tested for two semesters among students of the second

year of study at the FSEI HPE “Chelyabinsk state University”. The control group included 14 boys belonging to the special medical group on the level of health for physical education. The experimental group consisted of 16 boys, similar to the control group in physical, functional parameters and health group.

Young men from the control groups in the classroom on “Applied and health-improving physical culture” in the section “corrective gymnastics” engaged in the standard technique [4; 5]. The students of experimental group used the exercise equipment Agashin, according to our recommendations and methods, that is, working with a trainer for 7 minutes at the beginning and end of training sessions. In other respects, the content of the program on “Applied and health physical culture” in the surveyed groups did not differ. A total of 36 classes were conducted with the simulators.

The program of the experimental group included the most simple exercises with the Agashin simulator, the energy intensity of which corresponded to the physical capabilities of the students. These exercises were only part of the total physical activity performed throughout the classroom. The rest of the training session in both control and experimental groups, students performed physical exercises according to the General plan. This organization of classes is due to the recommended duration of one exercise with the simulator 10–30 seconds., for 8–15 minutes, including rest after each exercise, which corresponds to the effect of General physical training sessions lasting 20–40 minutes [2; 4]. The level of the given load was estimated on the basis of pulsometry after each series of 3–4 exercises.

The results of preliminary and final tests characterizing morphological and functional changes in the body of students were used to assess the differences existing in the groups characterizing the effectiveness of students’ work on Agashin simulators. All changes in the level of physical condition (samples Romberg, Ruffier, Rod, flexibility test, dynamometry of the right hand, and the weight index) were carried out and analyzed by conventional methods.

**Results and discussion.** Organized and conducted our research has shown that the simulator Agashin, used by the method developed by us, more effectively contributes to the psycho-physiological and physical development of students of the experimental group. Analyzing the obtained data, it can be noted that in the experimental group the progress in the development of physical qualities (hand dynamometry, Romberg’s test) is more noticeable. And also, the indicators of performance (sample Rufe, alloy Rod) showed a greater increase than in the control group (table).

Thus, the health-improving effect of exercises with the Agashin simulator, provided by the wave mechanical action and the effect of biomechanical resonance, frequency coordination and ordering of processes in the cardiovascular, neuromuscular and other systems of the body involved in the cyclic nature of their movements is more pronounced in the experimental group.

The effectiveness of the wave simulator is due to the nature of the natural biomechanical (wave) effects on the functional systems of human vibrations in the form of biomechanical waves affecting the body, restoring and training various groups of muscles, ligaments, tendons, vessels, capillaries and nerve endings. On the

**Indicators of physical development and functional readiness of students of special medical group of health ( $M \pm m$ )**

№	Indicators	Experimental group ( $n = 16$ )	Test group ( $n = 14$ )	Statistical differences (% , P)
1	Growth, centimeters	174,8±1,6	174,2±0,7	0,3
2	Weight, kg	66,3±2,3	66,5±0,7	0,3
3	Quetelet index, g/cm	379,3±15,1	381,7±8,2	0,7
4	Chest circumference in pause, cm	84,1±1,4	82,7±0,1	1,7
5	Bending forward from a sitting position, cm	9,2±1,1	9,3±1,6	1,1
6	Hand dynamometr, kg	32,3±1,5	30,4±0,7	5,9 (<0,05)
7	Rod test, with	38,2±1,4	24,9±1,2	34,2 (<0,01)
8	Test Rufe, conventional units	9,2±0,5	10,7±0,4	16,3 (<0,05)
9	Sample Romberg, with	14,3±1,2	8,5±0,5	59,4 (<0,001)

basis of the description of possibilities of practical use of the wave simulator of Agashin received by us, including complexes of the developed exercises, the experimentally approved technique was included in the program of occupations on disciplines of physical culture with the students carried on a state of health to special medical group.

**Summary.** We have experimentally confirmed that the use of Agashin wave simulators produces a healing effect caused by mechanical waves initiating biomechanical resonance. This leads to the frequency coordination and normalization of the various body systems involved.

The tested technique allows to reduce the intensity of the specified loads without worsening the positive effect on the body of the students. This fact is important due to various restrictions in those engaged in special medical groups.

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## Использование волновой гимнастики для повышения уровня здоровья студентов

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Применение инновационных средств в процессе физического воспитания обучающихся в высших учебных заведениях, с одной стороны, не должно вносить сложности в организацию учебных занятий, а с другой, использование новых методик и средств их реализации призвано повысить эффективность процесса формирования и сохранения здоровья студентов. В этом контексте нами экспериментально установлено, что коррекция применявшихся ранее методик использования тренажёров Агашина существенно усиливает эффекты биомеханического резонанса, обеспечиваемые волновым механическим воздействием. При этом, используя упражнения циклического характера, можно добиться более выраженного эффекта согласования и нормализации процессов функционирования различных систем организма человека (дыхательной, сердечно-сосудистой и др.).

**Ключевые слова:** волновая гимнастика, физическое воспитание, здоровье студентов.

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