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TÍTULO: Influencia de las tecnologías de acondicionamiento físico en el desarrollo de las cualidades físicas de los jóvenes estudiantes.

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RESUMEN: El artículo estudia la influencia de las tecnologías modernas de fitness en el nivel de desarrollo de las cualidades físicas de los estudiantes de ambos sexos. 232 estudiantes (88 hombres y 144 mujeres) participaron en la investigación. Se formaron dos grupos experimentales (GE, 47 hombres y 71 mujeres) y dos grupos de control (GC, 41 hombres y 73 mujeres). Los estudiantes de GC participaron en el sistema tradicional de educación física, y los estudiantes de GE en el sistema metódico experimental, basado en los tipos modernos de tecnologías de acondicionamiento físico.

Las pruebas de aptitud física de los estudiantes se llevaron a cabo de acuerdo con ejercicios que caracterizan el desarrollo de cualidades físicas.

PALABRAS CLAVES: educación física, cualidades físicas, tecnologías físicas, estudiantes.

TITLE: Influence of fitness technologies on the student youth's physical qualities development.

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ABSTRACT: The article studies the influence of modern fitness technologies on the level of development of the physical qualities of students of both sexes. 232 students (88 men and 144 women) participated in the research. Two experimental groups (GE, 47 men and 71 women) and two control groups (GC, 41 men and 73 women) were formed. GC students participated in the traditional physical education system, and GE students in the experimental methodical system, based on modern types of fitness technologies. The physical fitness tests of the students were carried out in accordance with exercises that characterize the development of physical qualities.

KEY WORDS: physical education, physical qualities, fitness technologies, students.

INTRODUCTION.

The low level of physical fitness of student youth in Ukraine is a nationwide problem, which is associated with the low initial level of health and physical fitness of young people entering the higher educational institutions, the reduction of physical education lessons in educational institutions, the lack of efficiency of the current physical education system, the decline of interest and motivation of students to traditional classes and other reasons (Bodnar, Stefanyshyn, & Petryshyn, 2016; Griban, 2009; Kharchenko, Kharchenko, & Shaparenko, 2019; Prontenko et al., 2019; Zelenskyi, & Zelenskyi, 2018). One of the perspective ways to solve this problem is the introduction to the physical education of students of fitness technologies, which are based on the use of modern kind of sports and physical exercises (Bolotin, & Bakayev, 2015; Griban et al., 2018; Mozolev et al., 2019).

Analysis of scientific sources showed that scientifically based physical activity programs, as well as methodical guidelines for different age groups, are widely used (Chernozub et al., 2018; Cybulska, & Drobnik, 2015; Ilnytska et al., 2016; Ivanchykova et al., 2018; Kozina et al., 2018). Among the scientific researches in this field, we note the methodical and monographic editions (Bulatova, & Usachov, 2008; Dobrodub, 2011; Hawley, & Franks, 2000; Zinchenko, & Usachov, 2011). Positive results of various types of fitness usage in practice are also known in the studies (Beliak, 2014; Radas, Sesar, & Furjan-Mandic, 2017).

Despite of a lot of scientific studies, the problem of finding effective programs, techniques and fitness technologies for improvement of students` motor activity, which would contribute to the development of positive motivation, increase physical fitness level and form the basis of independent health-improving activity, remains.

DEVELOPMENT.

Methodology.

The aim of the article is to study the influence of modern fitness technologies on the level of physical qualities development of both sexes' students.

Two hundred thirty-two students of the Zhytomyr Ivan Franko State University (88 males and 144 females) from different faculties (historical, psychological and pedagogical, physical and mathematical, philology and journalism) aged from 18 to 20-year-old took part in the research. Two experimental groups (EGm included 47 males, EGf included 71 females) and two control groups (CGm included 41 males, CGf included 73 females) were formed.

Formation of groups was carried out at the beginning of the study (in the first semester) from the students of the main medical department on the basis of the questionnaire results to find out the interests, motives and needs of students for training according to the traditional system of physical education or additional classes of fitness technologies. The indicators of physical fitness of students from EG and CG at the beginning of the experiment were reliably the same ($p>0.05$).

The experiment was organized in 2016–2018 during the training of students in the 1^{st} and 2^{nd} years of study. CG students were engaged in the traditional system of physical education, EG students – in the experimental methodical system, which is based on the modern types of fitness technologies. In our research, fitness technologies are the rational ways of purposeful interaction of participants in the pedagogical process that is based on the types of motor activity aimed at obtaining the maximum possible health effect, the realization of students' need for health and careful attitude to it through conscious regulation of physical activity.

Fitness technologies are the system of constructive influence on the students' body by means of specially selected, dosed exercises that provide solutions to important health problems. They allow to reflect the biological (state of health, physical fitness, motor activity), mental (motives, interests),

social (healthy lifestyle) needs of students for physical education classes. EG students were offered the following modern types of fitness technologies: power fitness, aerobics, Pilates, yoga, and tae-bo for additional classes with the use of fitness technology.

Testing of physical fitness was carried out according to the exercises that characterize the development of students' various physical qualities of both sexes (speed, endurance, power, agility, flexibility): 100 m race (speed), 3000 m race (endurance, males), 2000 m race (endurance, females), pull-ups (power, males), push-ups (power, females), shuttle running 4 x 9 m (agility), forward inclination of body from a sitting position (flexibility). The assessment was carried out in accordance with the Regulations on state tests and standards of assessment of physical fitness of the population of Ukraine (Table 1).

Research methods: study, analysis and generalization of scientific, pedagogical, methodological literature, pedagogical observation, questioning, testing, pedagogical experiment, methods of mathematical statistics. The research related to human use has been complied with all the relevant national regulations and institutional policies, and has followed the tenets of the World Medical Association Declaration of Helsinki – ethical principles for medical research involving human subjects. Informed consent has been obtained from all individuals included in this research.

Table 1. Tests and standards of assessment of students' physical fitness

Tests	Sex	Points / Standards				
		5	4	3	2	1
100 m race, sec	Male	13.2	13.9	14.4	14.9	15.5
	Female	14.8	15.6	16.4	17.3	18.2
3000 m race, min, sec	Male	12.00	13.05	14.30	15.40	16.30
2000 m race, min, sec	Female	9.40	10.30	11.20	12.10	13.00
Pull-ups, reps	Male	16	14	12	10	8
Push-ups, reps	Female	24	19	16	11	7
Shuttle running 4 x 9 m, sec	Male	8.8	9.2	9.7	10.2	10.7
	Female	10.2	10.5	11.1	11.5	12.0
Forward inclination of body from a sitting position, cm	Male	19	16	13	10	7
	Female	20	17	14	10	7

Results and discussion.

The analysis of indicators of students' physical fitness obtained during the pedagogical experiment proved the high efficiency of implementation of the methodical system of fitness technologies application into physical education of students.

In all tests that were completed to assess the level of physical fitness, EG students (male and female) significantly improved their indicators.

The analysis of the results in 100 m race showed that, over the period of the experiment, the average results of EGm students were improved from 14.52 sec to 13.68 sec, the reliable difference was 0.84 s ($t=3.95$; $p<0.001$). In EGf the results were also improved significantly for 1.36 sec (from 18.02 sec to 16.66 sec; $t=6.85$; $p<0.001$).

In the control groups, the indicators of speed qualities development were also improved, but in CGm, and CGf the difference between the indicators at the beginning and at the end of the experiment was not reliable. In CGm it was 0.24 sec ($t=1.26$; $p>0.05$), and in CGf it was 0.20 sec ($t=1.18$; $p>0.05$). The dynamics of speed qualities development of EG and CG students during the pedagogical experiment according to the Regulations on state tests and standards of assessment of physical fitness of the population of Ukraine are shown at Fig. 1.

The investigation of the results of male students in 3000 m race showed that in both groups, students' endurance development was improved during the experiment: in EGm – from 14 min 18 sec to 12 min 43 sec, and in CGm from 14 min 20 sec to 13 min 37 sec. However, the difference between the initial and final experimental data in EGm (1 min 35 sec) was reliable ($t=3.62$; $p<0.001$) and in CGm (43 sec) – unreliable ($t=1.84$; $p>0.05$). The dynamics of the level of female student endurance development was the similar: reliable ($t=2.75$; $p<0.01$) improvement of results in 2000 m race in EGf (for 56 sec) and unreliable ($t=0.87$; $p>0.05$) in CGf (for 14 sec). The results of students of the studied groups according to the Table 1 are shown in Fig. 2.

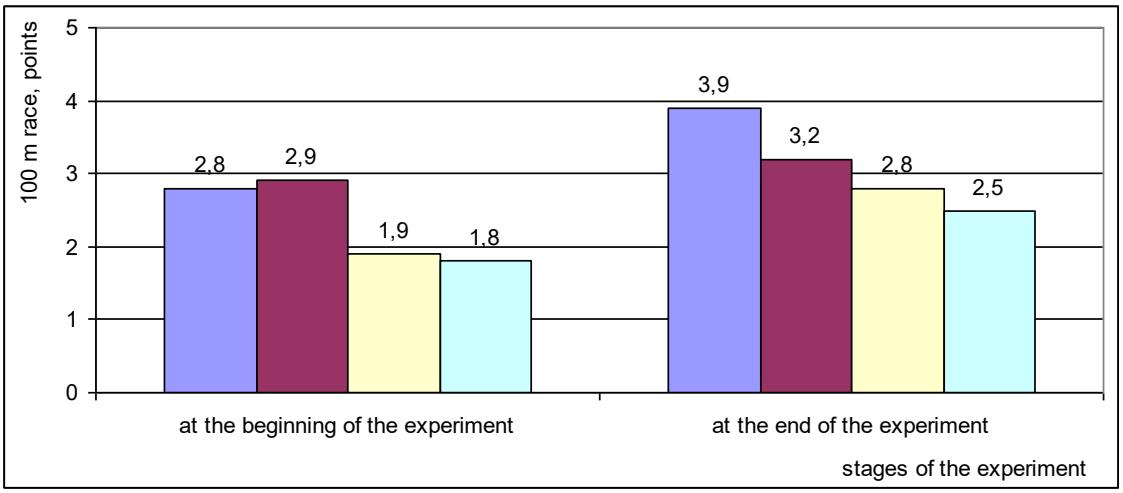

Fig. 1. Dynamics of speed qualities development of EG and CG students during the pedagogical experiment (100 m race, points).

– indicators of EGm students.
– indicators of CGm students.
– indicators of EGf students.
– indicators of CGf students.

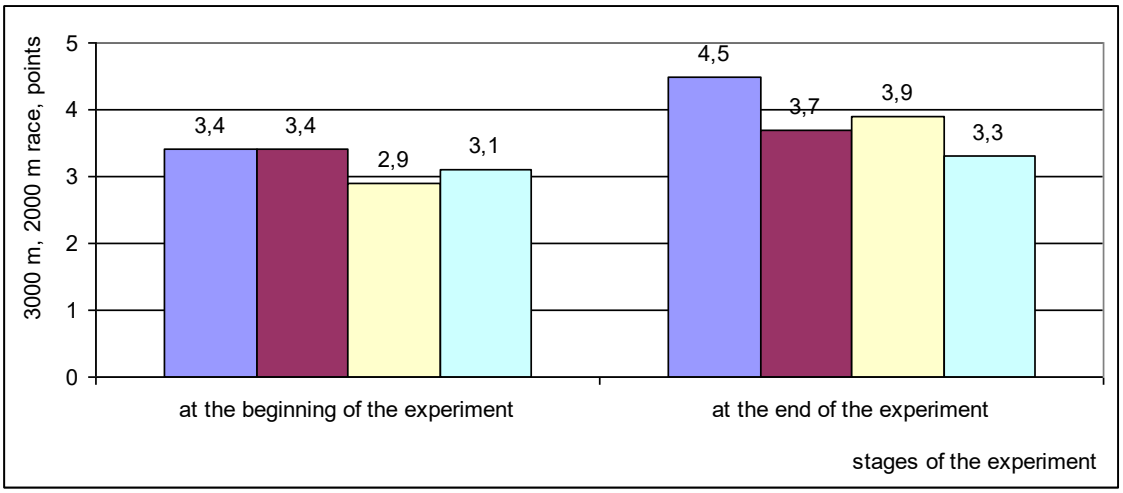

Fig. 2. Dynamics of endurance development of EG and CG students during the pedagogical experiment (3000 m race for male, 2000 m race for female, points).

– indicators of EGm students.
– indicators of CGm students.
– indicators of EGf students.
– indicators of CGf students.

The investigation of power qualities development of male students was carried out by the results in pull-ups on the crossbar, and of female students – in push-ups. A more pronounced increase was observed in EG students (both males and females) (Fig. 3). The results of EGm students were significantly increased during the experiment from 8.61 to 14.04 reps ($t=3.83$; $p<0.001$), and in CG – from 8.48 to 11.04 reps ($t=2.15$; $p<0.05$). In EGf students, the indicators in push-ups were improved from 8.49 to 16.69 reps ($t=3.96$; $p<0.001$), and in CGf – from 8.75 to 12.34 reps ($t=2.78$; $p<0.01$).

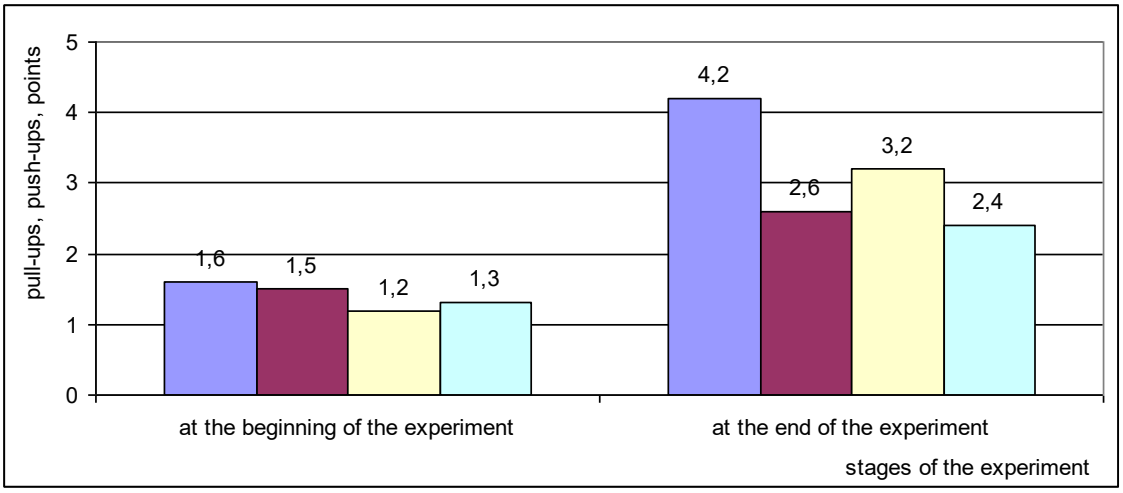

Fig. 3. Dynamics of power qualities development of EG and CG students during the pedagogical experiment (pull-ups for male, push-ups for female, points).

– indicators of EGm students.
– indicators of CGm students.
– indicators of EGf students.
– indicators of CGf students.

Analysis of agility development showed that in the results of students the experimental groups (males and females) in shuttle running 4 x 9 m were significantly improved during the pedagogical experiment: in EGm the difference between the indicators of agility at the beginning (10.43 sec) and at the end of the experiment (8.93 sec) was 1.50 sec ($t=2.15$; $p<0.05$), and in EGf – 1.28 sec ($t=2.07$; $p<0.05$). In the CGm students, the results were also improved significantly for 0.83 sec ($t=2.04$;

p<0.05), and in CGf – for 0.55 sec, but did not change significantly (t=0.87; p>0.05). The dynamics of agility development of EG and CG students (both males and females) during the experiment according to the Regulations on state tests and standards of assessment of physical fitness of students are shown at Fig. 4.

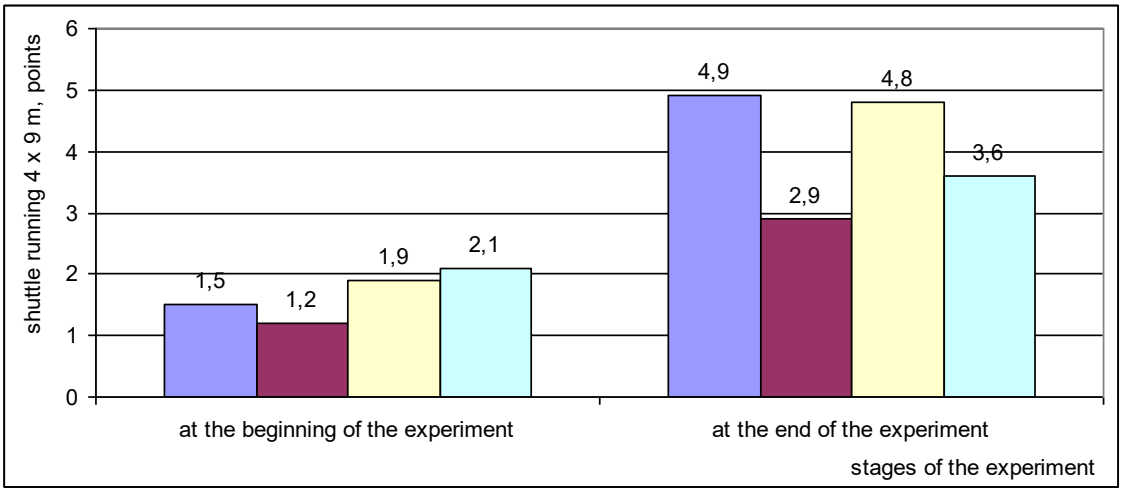

Fig. 4. Dynamics of agility development of EG and CG students during the pedagogical experiment (shuttle running 4 x 9 m, points).

– indicators of EGm students.
– indicators of CGm students.
– indicators of EGf students.
– indicators of CGf students.

Based on the results of the analysis of the flexibility indicators, we can conclude that the methodological system of modern fitness technologies application is more effective than traditional one. Thus, the results of the EGm students in forward inclination of body from a sitting position were increased for 7.37 cm (from 8.85 to 16.22 cm; t=3.75; p<0.001), and in EGf – for 6.62 cm (from 11.94 to 18.56 cm; t=3.53; p<0.001). In the CG students, the flexibility indicators were also increased for 2.39 cm in CGm and for 2.12 cm in CGf, but the difference between the initial and final data of the experiment was unreliable (t=1.64; t=1.47; p>0.05) (Fig. 5).

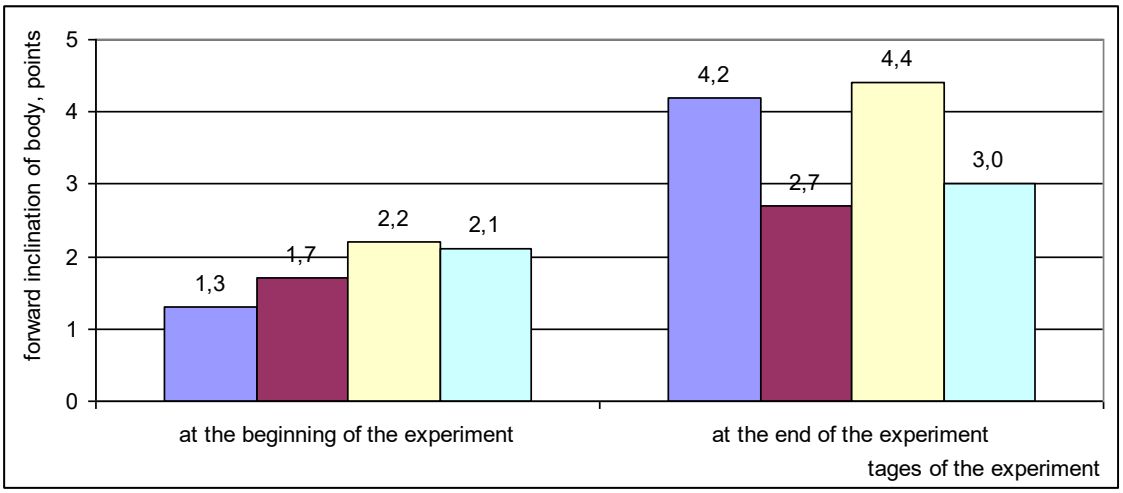

Fig. 5. Dynamics of flexibility development of EG and CG students during the pedagogical experiment (forward inclination of body from a sitting position, points).

– indicators of EGm students.
– indicators of CGm students.
– indicators of EGf students.
– indicators of CGf students.

A comparative analysis of the results of EG and CG students at the end of the pedagogical experiment showed that in all tests the indicators of EG students (males and females) were significantly better than those of CG students ($p<0.05–0.001$), which confirms the effectiveness of the experimental methodical system of modern fitness technologies application.

So, the best indicators of physical qualities development were shown by EG students (males and females) in all tests: 100 m race, 3000 m race, pull-ups, push-ups, shuttle running 4 x 9 m and forward inclination of body from a sitting position. At the same time, the results of the CG students were reliably improved only in pull-ups (males), push-ups (females) and shuttle running 4 x 9 m (males) ($p<0.05–0.01$). The results in such important tests as 100 m race, 3000 m race and forward inclination of body from a sitting position have not improved significantly ($p>0.05$). This testifies that the traditional system of physical education does not provide the necessary physical fitness level of students during two academic years.

The obtained indicators of students' physical qualities development in EG both males and females at the end of the experiment confirm the fact that training according to the methodical system of fitness technology application combines a set of systematic means, techniques, rules and methods, with the help of which the students realize, perform and practice motor actions which are aimed at increasing motor activity and involving them into physical and health improving activities. The obtained results confirm the conclusions of many scientists' works (Batilani, Belem, & Both, 2018; Bolotin, & Bakayev, 2015; Chernozub et al., 2018; Kozina et al., 2018; Mozolev et al., 2019; Radas, Sesar, & Furjan-Mandic, 2017) who studied the effect of physical activity and sports on performance indicators, health and efficiency of training and future professional activities.

CONCLUSIONS.

The positive influence of the experimental methodical system of modern fitness technologies application in the process of physical education on the level of students' physical qualities development of both sexes was established. All the tests completed by the students of the EG show a significant ($p<0.05–0.001$) growth in the results. At the end of the experiment, EG students (both males and females) had significantly better results in all exercises than CG students ($p<0.05–0.001$). It confirms the positive influence of training according to the modern fitness techniques.

In general, the results of the conducted pedagogical experiment allow us to state that the introduction of experimental methodical system of modern fitness technologies application promotes activation of educational activity, increases motor activity, formation of motivation to systematic training by modern fitness technologies and to adherence to a healthy lifestyle.

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