

## RATIONAL ORGANIZATION OF TRAINING A GROUP OF PHYSICAL REHABILITATION ON THE INITIAL STAGE OF TRAINING IN UNIVERSITIES

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**Annotation.** *Purpose:* to justify a rational approach to organization of group sessions of physical rehabilitation at the initial stage of training in universities. *Material:* 217 students of groups of physical rehabilitation KhNEU named Simeon Kuznets were involved in the experiment. *Results:* the organizational difficulties of physical education classes in groups of physical rehabilitation at the beginning of the school year were examined. An effective way of determination of the level of students' functional state was identified. The effectiveness of the formation of groups of physical rehabilitation at the initial stage of training was experimentally verified on base on the definition of students' functional state and the content of this stage of training was determined. A reduction of the level of students' functional state of physical rehabilitation groups at the beginning of studying (I semester) was stated. *Conclusions:* the proposed changes in the organization of students with disabilities in health status in the group by the level of functional status and the content of studying allowing students to preserve the functionality of the initial stage of studying.

**Keywords:** *group, physical, rehabilitation, level, functional, status.*

### Introduction

Today the questions regarding the intensification of production stand sharply, requirements for the quality of specialists training in higher educational institutions, claims for specific types of professional activities and demands on the health of future employee are enhancing.

In modern conditions place and functional role of man in today manufacturing process changes. It requires a mind-body training, because the decrease in the proportion of simple physical labor doesn't remove the requirements for psychophysical training of students, but changes its structure and proposes additional requirements for the formation of active mental and physical abilities by using a focused use of physical exercise [5, 7].

It requires an active search for new forms and methods of physical education, that would help improve the training of future professionals in higher educational institutions [3, 6, 14].

Today in Ukraine developed a critical situation directly related to the health of the population. This is primarily due to the crisis in the national system of physical education of the population that doesn't meet modern requirements and international standards of physical fitness [12].

Organization of physical education in high school isn't conducive to the effective reduction of the deficit of students' motive activity, which is one of the reasons for all sorts of deviations in their health. It was established that during the period of study in higher educational institutions the number of preparatory and special medical groups increases from 5.36% in the first year to 14.46% at senior courses [3, 5]. Most university graduates aren't able to work efficiently with the performance required by modern production [8].

It isn't possible to change the situation due to the country's existing traditional health care system radically, because of lack of funds for its development. At the same time in other countries attach great importance to development of physical training, physical education and sports, considering them as the most cost-effective and efficient means of preventing disease, strengthening the gene pool and solving other social problems [11, 12, 15]. Therefore, before the universities of Ukraine becomes actual issue for further improvement of all elements of physical education and timely response to potential changes in the direction, content and methods of physical training of all categories of people.

Work carried out by plan research department of physical education and sport Kharkiv National University of Economics named Simeon Kuznets "The organization of physical education classes in high school of economic profile".

### Purpose, tasks of the work, material and methods

*Aim* – justification of a rational approach to organization of lessons of group physical rehabilitation at the initial stage of learning in high school.

To achieve this aim, in the work raised and solved the following problem:

1. Set the reasons that complicate holding classes in groups of physical rehabilitation at the initial stage of learning the traditional system of organization.
2. To substantiate approaches to organization of lessons of group physical rehabilitation at the initial stage of learning based on the definition of the functional state of students and learning content.

*Object of study* – the process of physical education with groups of physical rehabilitation.

*Subject of study* – the organization of lessons with groups of physical rehabilitation.

To solve the tasks used the *following methods*: analysis and synthesis of scientific information on the study, teaching and documentation; testing students of groups physical rehabilitation, methods of mathematical processing of the results.

### Results of the researches

In Ukraine, physical education carried out in all schools by conducting obligatory lessons according to the curriculum. Physical education of youth in Ukraine is an essential part of the education system [6, 13].

Physical education in higher educational institutions was declared a compulsory subject in the Modern Social System of an educational cycle according to the state educational standard, that provides profiled and physical fitness and it is an essential component of holistic personal development, health promotion factor [13]. Physical training classes held with students of full I-IV courses as part of the educational process; physical training classes in study groups held according to the curriculum for educational institutions of Ukraine III - IV accreditation levels. Classes in educational groups held 2 times a week for 2 hours. The purpose of physical training in universities is to develop physical culture of student as systemic and integrated personality, an integral component of general culture of the future specialist who can implement it in academic, social and professional activities and family [7].

According to the "Regulations on medical control for physical education of population" and to a differentiated approach to physical education classes, all students pass medical examination every year in a polyclinic and, depending on status of health and functional training, classes are divided into 3 groups: primary, preparatory and special medical.

Students, who have abnormalities in health, usually a chronic disease or damage of musculoskeletal system, involved in a special medical groups. For practical classes, students are sent to the training group, which usually consists of 8 - 12 people.

According to the Ministry of Education and Science of Ukraine № 4 dated 11.01.2006 "On approval of the organization of physical education and mass sports in higher education institutions" educational division of the department physical education of university, which covers students of special training department (special medical group), there is a section in physical rehabilitation [2, 8, 13].

There are several approaches to the distribution of students who are engaged in a physical rehabilitation groups into subgroups: the basis of age, sex, type of disease, according to nosology, belonging to the group, course, for functional status, etc. The most common and effective is considered the principle of forming groups for lessons according to nosology [1, 4, 13].

In practice, teachers of physical rehabilitation groups face with organizational inconvenience that can not effectively use the traditional organization of lessons with groups of physical rehabilitation at an early stage (beginning of the year). These are:

- dividing students into groups according to nosological characteristics is made on the recommendation of a doctor on medical examination, and these results are communicated to teachers in October;
- working educational program does not include activities and time to determine the physical condition of students with disabilities in health;
- contents of the first semester of the work program doesn't meet the purpose which declares and the specific aims of the semantic module training program, because it focused on the distribution of groups on nosology component.

These disadvantages are amplified by the fact that the number of students who have several diseases with different nosological groups increased.

To verify this during 3 academic years in groups of physical rehabilitation in 197 students were identified indicators of physical qualities (Tabl. 1) and the level of functional status (Tabl. 2) at the beginning of training and at the end of the first semester.

Table 1

*Test results of physical characteristics of students (in points) in physical rehabilitation groups (n = 197) during the 2010 - 2013 academic years*

Physical quality	The beginning of training			The end of the first semester			t	p
	M <sup>1</sup>	±m <sup>1</sup>	S <sup>1</sup>	M <sup>2</sup>	±m <sup>2</sup>	S <sup>2</sup>		
Flexibility	2,67	0,1	1,43	2,81	0,1	1,36	1,0	>0,05
Speed	3,3	0,06	0,8	3,3	0,06	0,83	0,05	>0,05
Force	2,48	0,05	0,7	2,34	0,09	1,19	1,5	>0,05
Agility	2,65	0,07	1,01	2,5	0,09	1,2	1,37	>0,05
Endurance	2,86	0,09	1,24	2,95	0,1	1,38	0,74	>0,05

Table 2

The results of determination of the students' functional status of groups physical rehabilitation during 2010 - 2013 academic years

The level of physical status	The beginning of training			The end of the first semester			t	p
	M <sup>1</sup>	±m <sup>1</sup>	S <sup>1</sup>	M <sup>2</sup>	±m <sup>2</sup>	S <sup>2</sup>		
Test score physical status (in points) (n = 56)	61,07	3,03	22,67	51,1	2,62	19,63	2,77	<0,05
Index of physical status by E.A. Pirogova (in arb. un.) (n = 75)	0,49	0,02	0,2	0,39	0,02	0,17	3,63	<0,05
Functional sample (sec) (n = 66)	210,04	9,28	75,39	291,28	9,53	77,39	6,44	<0,05

To determine the indicators of physical qualities used tests with no contraindications for most nosological groups (flexibility - torso forward from a seated position; speed - torso forward from a seated position; speed - "relay" test of arm compression on line, that falls; force - bending and straightening the arms in the emphasis lying on the knees; agility - to send the ball with both hands from the chest; endurance - walking 2-3 km). Test results are translated into points on the scorecard.

State level of organism functional systems characterizes its functional and morphological features. The level of the functional state of students was identified as one of the three most common ways to assess the level of physical state:

1. Physical Evaluation Testing [13]: includes 7 indicators, each of which is rated a certain number of points. Total points reflect the level of physical condition.

2. Physical Fitness Index (IFS) by E.A. Pirogova [9]. Based on the indicators received in rest developed a formula for predicting the level of physical state:

$$IFS = W \max / (350 - 2.6 * B + 0.21 * P)$$

where  $W \max = 700 - 3 * HR - 2.5 * MAP \text{ average} - 2.7 * B + 0.28 * M$ ;

$W \max$  - maximum power (W);

HR - heart rate (for 1 min);

MAP average - mean arterial pressure is determined by the formula:

$$MAP \text{ average} = (MAP \text{ s} - MAP \text{ d})/3 + MAP \text{ d};$$

B - age in years, M - weight (kg), P - height (sm).

3. Functional test with 10 squats [10, 11, 13]. Tight functional relationship between the cardiovascular and respiratory systems, on the one hand, with the physical performance of the body, on the other hand, allow use a number of blood circulation indicators and breathing in conditions of stress these systems for assessing adaptation to muscular activity. These tests most valuable in relation to diagnostic PET of special groups of students.

The analysis of the test results of students in physical rehabilitation groups (see tabl. 1) shows that some indicators of physical properties have improved (flexibility, endurance), some - not remained variables (speed), and some - worsened (strength, agility), but these changes aren't statistically significant ( $p > 0,05$ ).

The results of determination of the functional state of students in physical rehabilitation groups decreased (see tabl. 2). These changes have statistically significant indicators ( $p < 0,05$ ).

Despite the variety of many different ways to assess the functional status of human development and physical health technologies, single point of professionals' view of unified methodology to nosological diagnosis and correction of functional disorders has not been reached yet.

The authors compared three most common ways to assess the level of functional status (Physical Evaluation Testing, Physical Fitness Index (IFS) by E.A. Pirogova, a functional test of 10 squats). Analysis of the results showed a high correlation between parameters that received in three ways (0,956, -0,925, -0,945) (Tabl. 3). Due to information content, validity, reliability and the ability to use standard computer programs for processing, ease of use and little time spent in conducting, we offer to teachers of physical education departments to apply the Physical Fitness Index (IFS) by E.A. Pirogova.

Table 3

*The correlation coefficient of results of determination of the students' functional state in three ways*

№	Method for determination of the functional state	1	2	3
1	PET	-		
2	IFS by E.A. Pirogova	0,956	-	
3	Functional test	-0,945	-0,925	-

For the classes rational organization of groups of physical rehabilitation at an early stage of learning at universities was proposed approach based on the distribution of students in terms of functional status and systematizing content of content modules to meet specific purposes of the first semester.

The objectives of the first semester students are adapting to the learning environment, familiarity with the organization and conduct of training in physical rehabilitation groups, mastery of basic general developmental exercises that are recommended for all groups of diseases.

It was formed the experimental group, into which 20 first-year students, including representatives of major nosological groups were selected. Students were engaged in a group of physical rehabilitation, where physical education classes were conducted by one teacher for one program during the first semester.

During the testing of physical qualities indicators have been received the following data (Tabl. 4).

Table 4

*Test results of physical qualities indicators of students (in points) groups of physical rehabilitation (n = 20) 2013-2014 year of study*

Physical qualities	Before experiment			After experiment			t	p
	M <sup>1</sup>	±m <sup>1</sup>	S <sup>1</sup>	M <sup>2</sup>	±m <sup>2</sup>	S <sup>2</sup>		
Flexibility	2,55	0,84	1,79	2,9	0,79	1,68	0,16	>0,05
Speed	3,5	0,47	1,0	3,65	0,46	0,99	0,09	>0,05
Force	2,6	0,72	1,54	2,8	0,61	1,31	0,11	>0,05
Agility	2,8	0,55	1,18	3,2	0,6	1,28	0,18	>0,05
Endurance	3,1	0,66	1,41	3,2	0,67	1,44	0,07	>0,05

The level of functional status (Tabl. 5) at the beginning of study and at the end of the first semester is determined by an index of physical condition (IFS) by E.A. Pirogova [9].

Table 5

*The results of determination of the functional state of students groups of physical rehabilitation (n = 20) 2013-2014 year of study*

The level of physical state	At the beginning of study			The end of the first semester.			t	p
	M <sup>1</sup>	±m <sup>1</sup>	S <sup>1</sup>	M <sup>2</sup>	±m <sup>2</sup>	S <sup>2</sup>		
IFS by E.A. Pirogova (in arb. un.)	0,55	0,05	0,24	0,56	0,04	0,17	0,14	>0,05

The analysis of the test results of students in groups of physical rehabilitation (see tabl. 4) shows that all indicators of physical properties improved, but these changes are not statistically significant (p> 0,05).

Organization of physical education classes in groups of physical rehabilitation at an early stage of learning and training content systematization allowed to maintain the level of the functional state of students groups of physical rehabilitation constant (see tabl. 5).

Comparison IFS of students in groups of physical rehabilitation at the end of the first semester for the last 3 academic years with IFS students in 2013-2014 academic years has statistically significant difference (t = 3,86; p <0,001) and suggests a rational organization of physical education classes in these groups at an early stage of learning.

**Conclusions.**

1. Deterioration was found (p <0,05) of the functional status of students in groups of physical rehabilitation at an early stage of learning (the first semester). The reasons for this are: a temporary lack of information on the distribution according to students in groups to nosological characteristics; content discrepancy of study at the first semester to aim.

2. Organization of students with disabilities in health in groups in terms of functional status and inclusion in the content of education topics that include determination of the level of mastering the basic general developmental exercise for all groups of diseases, helped to keep the functionality of the students at an early stage of learning.

*Further investigation* requiring new approaches in the organization of physical rehabilitation groups and clarify the content of labor training program for the next stages of learning.

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