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*editors*



# **PHYSICAL EDUCATION IN UNIVERSITIES**

**\*RESEARCHES\***  
**\*BEST PRACTICES\***  
**\*SITUATION\***

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## Physical Education in Universities: Researches – Best Practices – Situation

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## Innovations in Physical Education in High Schools of Ukraine

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### Abstract

The article presents some innovative technologies that are being introduced into the higher education system of Ukraine. The need to introduce new technologies in the education system at the higher education level is due to the fact that in our time the conditions of the information space in which students of higher educational institutions live and study have changed significantly. In the era of the development of the Internet as a global information and communication system, the working conditions of students with information flows have fundamentally changed, the interaction with which is necessary for the full training of specialists. The human brain is a unique physiological structure that can adapt to various conditions of the information environment. However, it also has its own specific energy resource, which is not unlimited. Moreover, each person has individual parameters of this resource and its specific limitations, due to both the individual characteristics of the intellectual properties of a person and the state of his health in general, and especially the state of his central and peripheral nervous system. According to statistical studies, in Ukraine, as in many other countries of the world, there is an unfavorable tendency to a gradual increase in the number of people with certain deviations in their health status. The causes of this undesirable phenomenon are very diverse. Most of relevant experts confirm that the following are most important, the gradual deterioration of the environmental situation in some regions of the planet, the adverse changes in climatic conditions, the accelerating the pace of life, the excessive use of high-tech gadgets and much more. In the majority of people with health deviations, these deviations are functional in nature and can be corrected if the appropriate complexes of preventive and rehabilitation measures are correctly applied to these people. It is precisely this contingent of the population that constitutes the reserve of the strategic human resource of the state. When planning work with this contingent of the population, one should take into account the fact that the number of people who are part of this contingent will probably continue to increase, and, therefore, the relevance of this important problem will remain. A promising methodology for preparing students based on strengthening the component of practical work with people who suffer from functional health disorders is being tested at Boris Grinchenko Kiev University. Thanks to the application of this technique, patients have the opportunity to be closely monitored by future rehabilitologists and pass under their control modern complexes of preventive measures. In the future, this technique can be applied within the entire higher education system of a particular country. In addition, successful work with this contingent of the population in a higher education system can contribute to the successful resolution of an important state problem regarding the formation of a country's strategic human reserve for the needs of industry, agriculture and state power structures.

**Key words:** Professional health resource, Central nervous system, Specific physical exercise, Unique physiological structure, Persons with disabilities, Strategic human resource of the state

## Introduction

Nowadays, in Ukraine and in many other countries of the world, experienced scientists conduct a large number of scientific studies aimed at finding more advanced modern (innovative) methods for training specialists in the field of physical education and sports.

Analysis of modern domestic and foreign scientific literature shows that in recent years, scientists from many countries working in the field of physical education and sports have devoted their efforts to finding ways to solve important problems in this area. Some of them were devoted to general recommendations for optimizing people's physical activity in order to maintain and promote health (Gallaher, 2013; Finni, 2018).

The aim of other studies was to find optimal ways to activate the motor activity of individuals prone to increase body weight (Voss, 2010; Johnson, 2011), in order to increase energy expenditure and reduce total weight. Interesting results were obtained when studying the influence of the regime of motor activity on the mental performance of a person and the development of his cognitive qualities necessary for successful creative activity (Hillman, 2009; Davis, 2011; Charger, 2017).

Of crucial importance were studies conducted to determine the impact on human health of the specific conditions in which their physical activity is carried out. In particular, the regime of physical activity, the ecological situation in the environment of this population of people, as well as where this activity is carried out mainly: indoors or outdoors (Kitty, 2004; Kohl, 2015; Tendon, 2018).

Finally, such an important question as the exact determination of the parameters of normal physical activity of various age categories of the population which is vital necessary to ensure the maintenance of homeostasis in the body of individual was not ignored (Trots, 2016).

Without any doubt, all these issues are extremely important from the point of view of a deep scientific study the urgent problems of the development the modern system of physical education, designed for different categories of population and the training all categories of athletes. But, unfortunately, the question of the role played by higher education institutions, in particular specialized universities, in the development of a modern system of physical education for all age groups of the population remains underexplored to date.

It is known that the concrete situation inside society in every country in the world is constantly changing. And the modern state system of physical education, designed to different categories of the population must be adapted to the conditions of such changes in order to reliably fulfill the most important function in relation to ensuring the preparation of the state's strategic human reserve.

Of course, in ensuring the implementation of this important function for each state, the main role is played by experienced specialists working in sports universities and carrying out the function of training personnel to work in this system. And for the successful implementation of this function, they use effective innovative technologies.

This article is dedicated to this issue, based on the results of a special scientific study.



## Methods

This study was carried out from March 2016 to August 2019 on the basis of Boris Grinchenko University of Kiev and other educational institutions of Kiev. To participate in the study, 236 people aged 18 to 26 years were involved, in whom, according to the results of the clinical examination, functional health disorders were established.

In the course of work with this contingent of people, the following scientific methods were applied:

- studying medical records of people with health problems;
- method of pedagogical examination;
- method of pedagogical experiment;
- methods of physical examination of study participants;
- questionnaire method;
- method of interview;
- testing of physical qualities in dynamics;
- methods of statistical processing of obtained data.

At the first stage of work, we formed two groups of study participants with a total number of 236 people. At the same time, the main group consisted of 118 people with certain deviations in their state of health. And the control group consisted of 118 practically healthy individuals. The selection of participants in the groups took place in such a way that in each of them there were participants with approximately the same physical data (age, height, body weight, basic anthropometric indicators, etc.)

At the second stage of work, we studied the indicators of the basic physical qualities of the participants in each of the groups and compared them with each other.

During the third (longest) stage of the study, we used a special set of rehabilitation measures for participants in the main group, including daily physical therapy classes conducted under the supervision of experienced instructors. And the participants in the control group did physical training on their own or did not do it at all.

Finally, during the fourth stage of work, we completed the second measurement of the indicators of the basic physical qualities of each participant in this study and compared the results. At the same time, we compared the obtained data not only in pairs of mutually comparable persons, but also average data for all participants in the main and control groups.

This organization of the research investigation order allowed us not only to follow the dynamics of the development of basic physical qualities in people with health deviations and practically healthy individuals, but also to establish a change in the degree of lag of the indicators of the participants of the main group from the indicators of the participants in the control group.

The use of statistical methods for processing the obtained data allowed us to verify their reliability.

## Results

The first stage of our study was devoted to the formation of two equivalent groups of participants aged from 16 to 25 years. The total number of individuals, selected to participate in the study, was 236 people. Among this number of persons, 118 people were having certain deviations in their health status. They were included in the main group. And the control group included 118 practically healthy individuals. The selection of participants in the groups was carried out in such a way that in each of them there were participants with approximately the same physical data (age, height, body weight, basic anthropometric indicators, etc.)

At the second stage of this work, a comprehensive medical examination and testing of the basic physical qualities of people involved in the study was conducted. And a comparison of the data obtained from persons with deviations in the state of their health with the data of practically healthy individuals of the same age was performed. It was found that the indicators of the physical qualities of persons with certain chronic diseases and impaired functional state of their body are significantly lower than the same indicators of persons who do not have such disorders.

During the longest third stage of this work we observed the dynamics of changes in physical qualities all participants of the study depending on the mode of their motor activity. Wherein with those participants, who had certain health deviations, were conducted systematic physical training classes, based on the using of special recovery programs. Moreover, those programs were designed for each of participants, taking into account the individual characteristics of their body and living conditions. Classes were held daily during all period of study and provided under the supervision of experienced medical rehabilitation specialists. All data obtained in the course of this study were recorded in special protocols to ensure the possibility of observing the dynamics of changes in the main indicators of the physical development of all participants of the study.

Finally, at the fourth stage of the work, we conducted a final comprehensive medical examination of all the individuals involved in this study, and testing the level of their physical properties. It was found that the scale of the lag in the development of basic physical properties in persons with health deviations has significantly decreased compared to indicators of practically healthy individuals.

For the convenience of performing the calculations, we obtained the indicators of the physical properties of the people involved in this study (the main group are people with health deviations and the control group are practically healthy people) expressed in arbitrary units. At the same time, we focused on typical indicators characteristic of most young people in Ukraine. For each of the age indicators of physical properties, an acceptable range of deviations was determined (from maximum to minimum values falling within the range of the general norm). As a reference point, we took the values of maximum indicators characteristic of a certain age category of persons and determined their compliance with the level of 100 conventional units.

After that, for each of the participants in the main and control groups, we determined the real indicators of the main physical properties and compared them with the maximum values of the normal range for this age category. Thus, we were able to determine how the indicators of the basic physical qualities of all participants in the study differ from the maximum normal indicators of these qualities characteristic of a given age.

Data obtained during the study are presented in the following tables.

**Table 1 Indicators of physical qualities of participants (main and control groups) at the beginning of the study**

No in order	Physical quality	Main group	Control group	Difference
1	Physical strength	64,6 ± 3,4	86,2 ± 4,1	21,6 ± 1,1
2	Endurance	61,9 ± 3,3	79,3 ± 3,9	17,4 ± 0,9
3	Dexterity	72,3 ± 3,7	91,1 ± 4,8	18,8 ± 1,0
4	Rapidity	55,4 ± 3,0	68,8 ± 3,5	13,4 ± 0,6
5	Coordination of movement	59,8 ± 3,2	72,5 ± 3,7	12,7 ± 0,5

We can see from the table № 1, that all indicators in participants of the main group (persons with deviations in their health status) were lower than the same indicators in participants of the control group (practically healthy individuals).

After a long period of work with the participants of the main group and a second study, we received the data presented in table 2.

**Table 2 Indicators of physical qualities of participants (main and control groups) at the end of the study**

No in order	Physical quality	Main group	Control group	Difference
1	Physical strength	85,4 ± 4,1	87,1 ± 4,2	1,7 ± 0,2
2	Endurance	79,3 ± 3,9	80,4 ± 4,0	1,1 ± 0,1
3	Dexterity	88,2 ± 4,0	89,3 ± 4,7	1,1 ± 0,1
4	Rapidity	69,1 ± 3,6	70,1 ± 3,6	1,0 ± 0,1
5	Coordination of movement	70,7 ± 3,6	71,9 ± 3,7	1,2 ± 0,1

As can be seen from table 2, after a long period of training with participants in the main group (persons with deviations in health status), the difference in the indicators of their physical qualities compared with the indicators of the participants in the control group (practically healthy individuals) decreased significantly.

This confirms the idea of the advisability of systematic work with the contingent of people with chronic diseases and pathological conditions of the body in order to develop their level of physical qualities, which is necessary for successful work in the future.

## Discussion

In the process of evaluating the significance of the results of this research work, a number of discussion questions may arise. And such situation confirms the presence of sufficiently high interest to this scientific problem and to finding the most optimal methods of solving it in radical way.

Indeed, a lot of studies, which were conducted in different research structures, confirm the fact that in many countries of the world in our time there is an unfavorable tendency to a gradual increase of the number workable people, who have certain deviations in their state of their health.

Therefore, if this negative tendency will be continued in the future, then perhaps over some period of time in society there will be a very serious problem, connecting with lack of human resources, which are necessary to replenish the ranks of workers in industrial enterprises, agriculture and other important areas of human activity.

The fact is that in the overwhelming majority of cases in those people, who have certain deviations in their state of health, the level of development their basic physical qualities is significantly lower than the level of development the same qualities among practically healthy individuals.

So, these persons will be unable to perform fully and efficiently main functions, which are provided for by the need to work in certain positions. And of course, these people in the future will be not able to be enrolled into the ranks of the armed forces and other power structures of the state to serve in positions that have high demands on the state of health of personnel.

One of the most justified ways to solve this problem is the scientific justification and development of special rehabilitation and preventive programs for people with disabilities in their health, through the use of which they can achieve the development of the necessary level of development of basic physical qualities, despite the presence of diseases and pathological conditions.

It is also important to understand why in many countries there is a tendency to a gradual increase in the number of residents suffering from certain diseases and having functional disorders of the body. Probably, the complex influence on the human's body of a whole wide spectrum of unfavorable factors should be recognized as the cause of this unfavorable phenomenon.

According to many experts, the most significant impact on the frequency of occurrence of certain diseases and pathological conditions of the body is caused by adverse changes in climatic conditions on the planet. Pollution of air, water and soil with toxic and ballast substances, which in most cases are industrial waste, components of fertilizers used in agriculture, constituting a variety of fuels used in transport, is also an important reason for the increase in the number of people suffering from chronic diseases.

It is impossible to ignore the cardinal change in the lifestyle of a modern person: a decrease in the level of his physical activity, eating genetically modified foods, psychological dependence on information flows supplied through a variety of modern electronic devices and others.

All these factors, acting to their mutual influence, lead to a negative changing's in the normal state of the human's body and form in it a whole chain of adverse changes (the so-called pathological conditions), on the basis of which various diseases subsequently develop.

At first glance, it seems that the detrimental effect of all these factors is inevitable and the tendency to continue the growth in the number of people with pathological changes in the body cannot be avoided. But based on scientific research, you can find a way to at least reduce the negative effect of this phenomenon.



This is, first of all, carrying out active systematic work of a preventive and rehabilitative nature with all the contingents of the population exposed to these negative factors. The secret to the success of this work lies in the fact that among people with health disorders, a significant part suffers from the presence of such functional changes in their normal physiological status, which, under certain conditions, may have the possibility of reverse development.

That is, if you start using the healing and restorative complexes of measures in a timely manner and continue their continuous use for a sufficient period of time, you can achieve the effect of a gradual decrease in pathological symptoms and a decrease in the manifestation of painful disorders in the body of the victims.

Thus, it is possible to avoid a further increase in the number of persons with pathological abnormalities in the body and develop in them the basic physical and intellectual qualities to such a level that is necessary to ensure the possibility of successfully carrying out labor activities.

The solution of this important, complex and responsible task on the scale of any state requires tremendous efforts, first of all, those specialists who work in the field of physical education of different categories of the population and in the field of public health.

And since this problem is global in nature, for its successful solution, the efforts of scientists from many countries of the world should be combined, which will make it possible to use the experience of modern human genius and take into account all the features of living anywhere on our planet.

IIEP international organization brings together the best specialists working in the field of physical education and sports in more than 140 countries, so the active participation of its members in the search for optimal solutions to this problem can contribute to its speedy resolution.

## Conclusion

Based on the data obtained during this study, the following conclusions can be drawn:

1. At present (both in our country and in many other countries of the world), there is a tendency to a gradual increase in the number of young people with health deviations.
2. In the vast majority of cases, the extent of manifestations of deviations in the state of health of young people can be significantly reduced in the context of the systematic use of special rehabilitation and preventive programs.
3. The contingent of the population, consisting of persons with functional deviations in their state of health, represents an important reserve, which, after applying appropriate special measures, can be used to replenish the strategic human resource of the state.

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