

# Improving the physical qualities of students in physical education lessons using fitness classes

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## **Abstract**

*In this article is analyzed fitness classes for improving students' physical qualities. In order to improve the physical qualities of students, there was used the methodology, which is based on the physical exercises' performance with musical accompaniment. This not only positively affected the mental and emotional state of the subjects, but also made it possible to apply an individual approach to each student, depending on his level of physical fitness.*

**Keywords:** *Fitness, physical qualities of students, musical accompaniment of physical exercises, student sports, keeping health.*

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## **Introduction**

The culture of health is inextricably linked with the system of scientific abilities, knowledge, skills and practical activities, aimed at strengthening and keeping personal health, as well as the health of others, also it occupies a leading role in the students' moral and physical education and in forming of common culture in the personality's harmonious development.

The most important task facing higher education at present is the training of specialists who, along with high professional qualities, also have a sufficient level of health, which gives the opportunity to realize full physical and intellectual potential. Because of it improving the quality of students' education at a higher educational institution, in our opinion, should be focused not only on optimizing moving activity, but also on acquisition of life knowledge by students about significant factors that affect human health.

The use of sports for students' recovery, primarily involves the correct choice of moving regime, adequate to the physical psycho-emotional state and level of students' physical fitness. In our opinion, the diversity and dosed level of physical activity provides the opportunity to increase the level of person's physiological reserves and to develop certain physical qualities and the ability to avoid overstrain of adaptation systems for muscular work. The leading indicator of the necessary level of a person's physical health, in our opinion, is the state of the main life support systems (respiratory and cardiovascular), as well as the general body's physical ability.

The impact of fitness on the human body has been being studied for a long time, for example, Tacha, Karolyn & Edwards, Verneda & Miller, Susan. (1984), Tubus, N.. (1982), Martindale, Edward &

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Devlin, Ann & Vyse, Stuart. (1990). Students are dedicated to promoting fitness among students. Benje. (2000), Holt, Laurence & Pelham, Thomas & Holt, Jason. (2008), Xu, Bin. (2015), Laughlin, Neil. (2003), Wang, Guilan & Shi, Jie & Xin, Miao. (2010), Yan, W. & Zhang, Y.. (2017). The use of fitness for medicinal purposes is considered by Weil, Richard. (2004).

In our opinion, the issue of fitness using in PT lessons has not been fully studied yet, thus, as part of this scientific work, we developed a special curriculum where the main emphasis focuses on fitness and therefore we've studied its efficiency.

### **Methods**

In this work we've analyzed fitness classes for improving students' physical qualities. Such trainers were being held at PT lessons with the Faculty of Economics of the Dnieper National University's students throughout the academic year.

At the beginning of the study, we tested the students' level of physical fitness on the following indicators:

**Speed Testing.** To test the speed capabilities of students, the number of taken steps was measured within the maximum mileage on the spot for 15 seconds and within the mileage at a distance of 100 meters.

**Strength testing.** To test the strength, we used hand dynamometers and exercises in a 16-kilogram weight press and pull-ups on the bar for young men, bending the arms from the resting position for girls.

Dynamometry was carried out for both boys and girls, both for the left and the right hands.

The test on power for young men was evaluated by the number of pull-ups on the high bar, as well as quantity of lifting the weight with the right and left hand separately. For girls, the test on power consisted of the number of completed such exercises as bending the arms in a getting down position for 3 minutes.

**Dexterity and coordination testing.** For testing dexterity and coordination, special exercises were used in the form of left and right hands' motion. For girls gymnastic exercises with a ball and a skipping rope were also used, and for boys were used gymnastic exercises on bars and shuttle run – 5 times for 10 meters each.

**Testing flexibility and mobility.** Such exercises like a slope in front of a non-bending leg were used for testing the flexibility and mobility in the joints by measuring the amplitude of testees' motion. The flexibility of the spinal column was evaluated by the distance from the fingertips to the floor with the maximum possible incline of the testees. To determine the mobility of the knee joints, squats with hands behind the head were used, and an assessment of the knee joints' mobility was made depending on the depth of the squat. The result was measured in points.

Mobility in the ankle joints was evaluated as follows: the testee was sitting on the floor, the feet were perpendicular to the area of the support. Mobility was determined by the maximum stretching of the toes from the starting position to the most extended foot, the result was measured in points.

**Endurance Testing.** Endurance testing for boys concluded a run on 3000 meters distance, for girls - on 2000 meters distance

**Jumping Testing.** Jumping ability was determined using the test (long jump from a place).

Tests of physical qualities: speed, strength, jumping ability, endurance are shown in table 1.

Table 1. Tests and standards for assessing physical qualities.

№	Types of tests	Regulations	Gender	Points				
				5	4	3	2	1
1	Speed	Running 100m	M	13.2	13.9	14.4	14.9	15.5
			F	14.8	15.6	16.4	17.3	18.2
2	Strength	Pull up on a high crossbeam (times)		16	14	12	10	8
		Bench Press (kg)	M	80	70	60	50	40
		Flexion and extension of the arms in an emphasis lying from the gymnastics bench (times)	F	6	5	4	3	2
3	Endurance	Running 3 km (min)	M	12.00	13.05	14.30	15.40	16.30
		Running 2 km (min)	F	9.40	10.30	11.20	12.10	13.00
4	Jumping	Jumping in length from stand position	M	260	241	224	207	190
			F	210	196	184	172	160
5	Mobility in ankle joint	Points	M	5	4	3	2	1
			F	5	4	3	2	1
6	Flexibility of spinal column	Points	M	5	4	3	2	1
			F	5	4	3	2	1

## Results

For improvement of students' physical qualities from the study group, we used a methodological, which is based on physical exercises, performed under the background sound of musical accompaniment. This not only affected positively the mental and emotional condition of the testees, but also gave the opportunity to apply an individual approach to each student, depending on his level of physical fitness.

In our opinion, any recovery activity should include three ground burden components - aerobic, power and stretching.

Our classes with students at PT lessons consisted of three components:

1. A preparatory activity or «warm-up», the tasks of which include: increasing the respiratory and heart rate, increasing body temperature, accelerating metabolism, raising the elasticity of tendons, muscles and ligaments. We started the preparatory part of the lesson (warm-up) with learning or repeating the basic motions and movements, used during dance aerobics, such as Step-Ter, marsh, Cross, Step-Touch, V-Step etc., as well as the backward lash “Leg Curl”, “Knee lift”, etc. At the same time, hands could be held on the belt, or students could work with them in free mode, as when walking. The teacher was watching the posture of those who were training in a musical rhythm. The «warm-up» activity lasted at about 10-15 minutes.

2. The main part that solves the tasks of the training process:

- a) to bring the pulse to the target zone;
- b) to learn new moving ligaments and increase organism's coordination capabilities.

Using the method of constant aerobic burden (non-stop), small repeating moving combinations, that consisted basic movements, were learned with method of "stringing". At the same time, hand movements (jerking and waving)

were added to the basic steps. The method of individualization was used here, less prepared students worked with their hands in free mode. For increasing the aerobic burden, the basic movements were replaced by dance “cross”, “Cha-Cha-Cha”, “mambo”, etc., and the steps were combined with the legs kicks “Kick”, with jumps “Jumping”, running on the spot “Jog” . For the most prepared students, hand movements were tangled with hands motions. Here, students had the opportunity to vary the degree of burden by themselves, depending on well-being and physical fitness. In other words, from performing combinations that consisted of simple basic steps to more complex dance combinations. Students with good level of physical fitness, who wished to improve their physical fitness, took additional weights or dumbbells from 0.5 to 2 kg.

When performing strength exercises in the porter (on rugs), as well as stretching exercises in the final part of the lesson, the teacher offered several options for performing exercises on the same muscle groups with different levels of difficulty. In strength exercises, everyone who wished, used additional weights and dumbbells.

The teacher divided the students into subgroups conditionally according to their level of preparedness:

a) students with high level of physical fitness and coordination abilities performed the moving combinations fully, without simplifications, possibly using additional weighting materials;

b) students with low level of physical fitness, but with good coordination abilities, repeated elements of moving combinations on the “march”, with minimal amplitude of hand movement, or without jumps, controlling the level of burden independently;

c) students with low level of physical fitness and poor coordination carried out a simplified version: only moving with legs, trying to follow the musical rhythm and performing elementary movements with hands.

The final exercises in our lessons were stretching exercises, or “stretching”. At this no more than 5-7 minutes was given and in this part of the lesson an individual approach was also used, it means that the principle of “do no harm” was applied. The goal of stretching was to relieve muscle strain by stretching, avoiding overloads in the joints. Because of the fact that the innate qualities of ligament and tendon elasticity and joint mobility are strictly individual for each person, special attention was paid to that issue that during stretching exercises there would not be extensive burden in the knee and ankle joints, as well as in the spine. If during leaning forward, person experienced discomfort or pain, then he was recommended a lightweight version of this exercise - to bend knees slightly and round back. If performing stretching exercises were correct, the increasing in the elasticity of muscles, ligaments and tendons was provided and the heart rate returned to normal.

The specificity of music as form of art concludes in the fact that experiences, moods, ideas are expressed in harmonious combination of rhythmically organized tones and sounds, with which person can put out his feelings and mood. Music not only touches person’s attention, but also has a various positive effect, increasing creative and intellectual abilities. It can give power or vice versa helps to relax. For example, classical music has a powerful charge of energy, having a treatment effect on the human body.

In our opinion, the speed and music rhythm induces body to move in unison, calm or excite nervous system, and therefore makes an effect on general physical condition of person (slowing down or increasing heart rate, state of muscle tone).

Regular fitness trainings help to improve health and maintain the level of mental and physical working capacity. The effectiveness of such lessons in greater extent depends on the choice of musical accompaniment.

Music induces certain feelings and emotions that correspond to one or another type of physical activity. Musical compositions that have become loved, inspire, motivate to the lessons and increase mood, concentration of attention, and also give a charge of energy and cheerfulness

According to our point of view, for each type of recovery fitness (aerobics, shaping, Pilates, body ballet, etc.), an adequate style of music and its pace should be selected. For example, music for aerobics needs to be rhythmic, without pauses, which sets the appropriate pace. The best option for gyms, in our opinion, can be rock music.

The musical tempo plays a special role by influencing person's mental and physical condition. For intense physical burden, in our opinion, faster pace of music is required, with a pace of 110 - 140 beats / min., for practicing Pilates - from 50 to 90 beats / min.

The pace of music (speed of music motion), in our opinion, should also be chosen taking into account the level of physical condition and preparedness of the student.

At the end of the school year we re-tested the physical qualities of students in the test group, the results are shown in Table 2.

Table 2. Evaluative tests of students' physical qualities in the test group at the beginning and at the end of the school year.

№	Types of tests	Standarts	Gender	Average point	
				At the beginning of the school year	At the end of the school year
1	Speed	Running 100m	M	4,2	4,3
			F	4,0	4,1
2	Strength	Pull up on a high crossbeam (times)	M	4,2	4,3
		Bench Press (kg)		3,9	4,0
		Flexion and extension of the arms in an emphasis lying from the gymnastics bench (times)	F	4,2	4,3
3	Endurance	Running 3 km (min)	M	4,0	4,3
		running 2 km (min)	F	3,9	4,1
4	Jumping	Jumping in length from stand position	M	4,2	4,4
			F	4,3	4,4
5	Mobility in ankle joint	Points	M	3,6	3,7
			F	4,0	4,1
6	Flexibility of spinal column	Points	M	4,0	4,0
			F	4,2	4,3

Thus, based on the received results, we'll conclude that fitness during PT lessons leads to an improvement in the physical qualities of students

### Discussion

In our time, the notion of “fitness” came into our life as quickly as the desire of all self-respecting people to have good physical shape. This shape can be achieved through persistent and regular training and significant physical exertion. The organization and management of training and educational work require careful thoughtful preparation from the teacher. The level of physical fitness, individual physiological characteristics, attitude to sport for the same number of lessons get to some students the opportunity to absorb a smaller quality of movements, and to others - more. Some students can quickly assimilate learning studying material in conditional of one method application, and for other students the alternative method may be most effective. The individual approach to students, as well as the attentive attitude of the teacher during physical education classes, greatly facilitates the assimilation of large number of difficult motion actions.

Fitness aerobics and its varieties are one of the most common directions in the practice of physical education.

Step aerobics is a kind of fitness in which a special platform (step) is used. On this platform, exercises with elements of Latin American dances and martial arts, in combination with strength and aerobic exercises are usually performed. All movements are performed in high-intensity mode, and each trainer, as a rule, uses his own practices to make a variety of workouts.

Within the intensity of influence on the human body, step aerobics is equivalent to ordinary running. With help of step aerobics it is possible to strengthen the cardiovascular system, optimize the functioning of the vestibular apparatus and lose weight. Step aerobics usually burns 200-350 kcal in one session, and as a rule, the effect of training becomes noticeable after about 4-6 weeks.

A sedentary lifestyle is the main cause of arthritis, as well as osteoporosis. Step aerobics can serve as an effective tool for the prevention of these diseases. Regular attendance of classes reduces joint and back pains.

Collective exercising of step aerobics helps reduce stress and boost mood. Fitball is a type of fitness that involves using of a special gymnastic ball of large diameter. These classes organically combine power and aerobic burden, while passing in a gentler mode. A ball is deformed under the influence of the body, and many muscle groups take part in maintaining equilibrium. With regular visits movements coordination improves, proper posture is formed and back muscles are strengthened, joint function is normalized, and it also has a positive effect on the functioning of the liver, digestive system and reins.

The musical composition, sounding during classes, raises the mood of students, reduces their stiffness, helps to perform more rhythmic and clear movements, reduces the feeling of tiredness, positively affecting the effectiveness of classes. Pleasant music makes it possible to recover much faster after burden, both mentally and physically.

In our opinion, for the correct selection of music, it is necessary, first of all, to take into account two main indicators: the maximum allowable heart rate (pulse) and musical tempo. The limits of permissible burden depending on age can be calculated by the formula:

$$206 - (0.64 \times (\text{age of practitioner})) = \text{the maximum allowable number of heartbeats.}$$

Unreasonably frequent and lengthy exercises with intensity above the anaerobic threshold do not bring any benefit to the body.

### **Conclusions**

The study that was carried out, showed that the types and forms of fitness aerobics allow you to use an individual approach in the selection of tools and methods of physical education. The developed methodology gives the opportunity to find the best option for students' training with a high level of physical abilities, as well as students with minor deviations in health, but who have a desire to engage in the main group of physical education.

For the development of motion qualities (speed, strength, endurance, etc.), in our opinion, it is important to deepen knowledge about physical education in a higher educational institution, which provides great opportunities for the formation of health culture. First of all, it should be based on the students' awareness in various factors that affects human health, as well as various methods of its keeping and strengthening, and promoting a healthy lifestyle.

The solution to this problem, in our opinion, should begin with informing students about the effects of various recreational physical exercises on the human body, as well as with the methods' basics in controlling and self-monitoring of the level of health. The leading role is given to teachers of physical education, who, in our opinion, should convey to students the required amount of knowledge about the

effects of muscle activity on the body. The modern way of life is characterized by decreasing in motion activity (hypokinesia) and lack of muscle efforts (hypodynamic), which cause a deep contradiction between the nature of life and human physiology. As a result of this, various kinds of adverse changes occur in the body, that manifest for example into a "hypokinesia illness".

At the same time, the activity of the cardiovascular and respiratory systems worsens, the physiological potential of the body decreases, the gastrointestinal tract suffers, the metabolism in the human body impaired, neuroendocrine regulation of functions upset, the immune system is weakened. The natural effective way to prevent this illness can be a sufficient amount of variety of physical activities. In our opinion students should possess these skills.

Obviously, that as a result of regular physical exercises within the optimal range, the energy potential of the body as well as the functional resources of the body increase, and the genetic program implements much more efficiently. Those who systematically engage in aerobic exercises, as a rule, have an increasing in mental performance and better coordination in the nerve centers activity. The regular exercising of various physical trainers allows establishing the harmony of the mental and physical state and serves as a factor of "mental defense." Aerobic burden stimulates metabolism and, as a result, increases the body's immune status.

During systematic physical education, skeletal muscle mass increases, the musculoskeletal system improves, excretion of metabolic products and plasma proteins from their intercellular areas is improved. This helps to increase the efficiency of muscles and their faster recovery. Positive changes are recorded in the blood, circulatory and respiratory systems, and digestion system is also improved.

As a result of regular muscle trainings, not only adaptability to physical burden increases, but in generally the body's resistance to stress agents and damaging factors is enhanced. At the same time, positive cross effects from regular physical activity reveal due to the enlargement in physiological reserves and increasing in the functional capabilities of organs.

In our opinion, a compulsory study of the "Valeology" course can and should play a significant role in obtaining necessary knowledge about health at universities.

The problems that it concerns in life sooner or later have to face everyone. In connection with the statements that we've recently told about, a circumstantial study by students of the most important facts that contribute to strengthening and maintaining health, in our opinion, should be not only a personal, but also a state task.

The system of useful knowledge, as well as practical proficiency and skills in strengthening and keeping of health, types of exercises studied by students during PT lessons at the university, constitute the basis of health culture that includes the whole range of actions aimed at creating of healthy lifestyle.

In this regard, in our opinion, the preparedness of students in physical culture should be evaluated not only by students' attendance, compliance with physical fitness standards, degree of participation in classes, nature of self-esteem and assessment of physical and mental condition, but also by level of knowledge about health culture. Students' understanding of physical health as one of the main values of society is an effective motive for the formation of healthy lifestyle, as its style and norm.

Sport and physical education, in our opinion, can be considered like the most important means for health strengthening, improvement of physical qualities, increasing working capacity and betterment the function of various body systems. This happens as a consequence of positive effects on the body of variety of physical exercises. During performing physical exercise, the body is always subjected to the burden. The degree of intensity of physical activity can vary over a quite wide diapason. In determining the optimal burden, in our opinion, it should be taken into account the physical fitness of a person and work of his basic body functions.

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