

## MODERN METHODIC OF POWER CARDIO TRAINING IN STUDENTS' PHYSICAL EDUCATION

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**Abstract.** *Purpose:* significant increase of students' physical condition and health level at the account of application of modern power cardio training methodic. *Material:* 120 students (60 boys and 60 girls) participated in the research. The age of the tested was 19 years. The research took one year. We used methodic of power and functional impact on trainees' organism (HOT IRON). Such methodic is some systems of physical exercises with weights (mini-barbells), to be fulfilled under accompaniment of specially selected music. *Results:* we showed advantages of power-cardio and fitness trainings in students' health improvement and in elimination obesity. Control tests showed experimental group students achieved confidently higher physical indicators. Boys demonstrated increase of physical strength and general endurance indicators. Girls had confidently better indicators of physical strength, flexibility and general endurance. Increase of control group students' body mass can be explained by students' insufficient physical activity at trainings, conducted as per traditional program. *Conclusions:* students' trainings by power-cardio methodic with application HOT IRON exercises facilitate development the following physical qualities: strength and endurance in boys and strength, flexibility and endurance in girls. Besides, it was found that such systems of exercises facilitate normalization of boys' body mass and correction of girls' constitution.

**Key words:** health, physical condition, students, physical education, power-cardio training, HOT IRON.

### Introduction

Recent years there has been observed negative tendency to noticeable worsening of modern young people: students' and pupils' physical condition and health [11, 30]. K. Hardman in his works expresses serious trouble about significant falling of students' physical health standards and growth of obesity in developed European countries and developing countries of Africa and Asia [12, 13]. It was found that young people's excessive involvement in internet activity and computer games was a serious threat to their physical and psychic health [22-24]. For correction of this negative situation scientists recommend to raise everyday level of young people's physical functioning. However, specialists note that physical functioning level of most of young people does not correspond to optimal parameters. As per the data of D. Basset most of USA youth do not realize the recommended 60 minutes a day of physical functioning [4]. It is also noted that youth of Russian Federation has insufficient level of motor functioning [30]. In this connection it is necessary to introduce substantial changes in acting to day physical education programs for youth in educational establishments. In opinion of M. Chin, attitude to pedagogic aspects of physical education teaching in modern schools and universities shall be significantly re-thought for liquidation of global threats to health of our planet population – excessive weight and deficit of every day motor functioning [9].

The studies, conducted in a number of Norwegian universities witness that in the process of students' physical education it is necessary to use methodic, which would motivate young people for active participation in working out training programs, choosing form of classes and selecting physical exercises [1]. P. Sabramaniam also says about importance of development of students' interest to physical culture practicing. In his opinion students' interest to trainings can be noticeably increased at the account of changes of some aspects of young people's educational medium [34]. In general demand in substantial increase of students' motivation for regularly and active physical culture and sports practicing is discussed by many specialists [5, 21, 32, 33]. Chinese scientists L. Song

and J. Chen note the absence of any interest to physical exercises in national HEEs students. It is connected with deficit of management and absence of encourage from physical education teachers [364]. Negative attitude to existing academic physical culture programs is demonstrated also by many American students [10].

The key to this problem's solution can be changes in physical education programs for students. Besides, it is necessary to raise the quality of young people's training. Rather important are modern training methodic, permitting for teachers to use new effective forms and methods of physical education in educational process. Scientists throughout the world discuss new styles of teaching in higher educational establishments [2, 3, 14-16]. The authors note that new styles of teaching permit for a student to actively participate in educational process and achieve the set targets with high effectiveness.

Specialists also note the absence of students' right for choosing the most favorable training programs in many higher educational establishments [37]. General orientation of physical education programs in higher educational establishments of Russian Federation, built on strict regulation of academic material is very serious pedagogic problem. Such orientation of physical education means and forms seriously restricts development of students' personal physical culture. It does not facilitate formation of their active interest to regular practicing physical culture and sports.

The demand in creation effective system of students' involvement in regular physical activity and healthy life style is pointed at by many scientists: A. Bolotin [6], Yu. Kopylov [18], A. Osipov [30, 31], M. Kudryavtsev [25, 26], I. Kramida [23], S. Iermakov [19, 20, 22, 27] et al. Modern fitness-technologies [35] and programs, based on power-cardio training can facilitate achievement of this target. It was found that significant part of modern youth desires to practice physical functioning. Such functioning includes dances, fitness-aerobic, power training in gyms. M. Byra affirms that active fitness-methodic can be successfully applied by HEE teachers in different forma of students' training [7]. Success of fitness-programs' application in students' health improvement is proved by studies of W. Chen [8]. Success of power-cardio programs' application in students' health improvement is proved by L. Konovalova [17].

**Hypothesis:** it is assumed that for successful solution of students' physical condition, physical fitness and health worsening it is necessary to change the form and methodic of physical culture classes in HEEs. It is offered to use methodic of power and functional training, known as HOT IRON. This methodic is a system of training exercises with mini barbells, oriented on increase of students' power endurance. The main exercises are: lunges with barbell on shoulders; squats with barbell; bench press of barbell, fulfilled under accompaniment of specially selected music. Positive effect of HOT IRON trainings are: reliable correction of body figure, loosing weight, growth of muscular tissues. Many scientists note that improvement of appearance (athletic body constitution, harmonious muscles and physical attractiveness) is an important stimulus for young people's regular trainings. This fact permits to use HOT IRON methodic in mixed and separate groups. It is known HOT IRON trainings can be practiced only with instructor\, who was trained in special centers and received appropriate certificate. That is why most of HOT IRON trainings are practiced in private fitness-centers, but not in educational establishments [29]. Therefore, HOT IRON application in education establishments is a kind of scientific novelty.

**The purpose of the research:** is significant increase of students' physical condition and health level at the account of application of modern power cardio training methodic.

#### **Material and methods**

**Participants:** 120 students (60 boys and 60 girls) participated in the research. The age of the tested was 19 years. All students gave consent for their participation in experiment.

**Organization of the research:** the researches were conducted in 2014-2015. The researches lasted one year. In training of experimental groups the author used methodic of power-cardio training on the base of HOT IRON program. The trainings were conducted by qualified instructors, who were trained in specialized HOT IRON centers. This fact guaranteed high quality of students' trainings. At the beginning of the research all students passed medical examination in university polyclinic and were admitted for physical trainings without any limitations. After it the tested were divided into 2 control groups (1<sup>st</sup> boys group and 3<sup>rd</sup> – girls' group) and 2 experimental groups (2<sup>nd</sup> – boys group and 4<sup>th</sup>- girls' group).

Control groups were trained on the base of sport and outdoor games. They were trained in gym. Experimental groups were trained as per HOT IRON programs under accompaniment of special music (power

exercises with weight). At the beginning and at the end of the researches all students passed a number of control tests for assessment their physical condition and physical fitness. Strength was estimated by quantity of chin ups on horizontal bar (for boys) and quantity of pressing ups in lying position (for girls). Endurance was assessed by Cooper's test – running the most possible distance for 12 minutes. Flexibility was assessed by forward bending from position standing on pedestal on which there were marks for measurements. Students fulfilled forward bent with straightened legs, touching the pedestal by hands fingers. 100 meters' run was used for assessment quickness.

*Statistical analysis:* was fulfilled with the help of SPSS program. Difference between mean values was found with Student's t-criterion.

### Results

At the beginning of the research test results did not show any confident differences between experimental and control groups' students. At the end of experiment boys of experimental group were confidently far ahead of his peers from control group in strength ( $P<0.01$ ) and endurance ( $P<0.05$ ). Besides, difference in body mass values was also found. Body mass of experimental groups' students practically did not change. Body weight of control groups' students confidently increased ( $P<0.05$ ). Results of boys' control tests are given in table 1.

**Table 1.** Physical condition and physical fitness indicators of the tested boys

Physical qualities	Before experiment		After experiment	
	Control group	Experimental group	Control group	Experimental group
Strength (chin ups, q-ty of times)	9±3	8±4	10±3	15±2**
Flexibility (forward bents, cm)	4±2	5±2	5±2	6±2
Quickness (100 meters' run, sec. )	13±4	14±4	13±2	12±4
Endurance (Cooper's test, km)	2.3 ±0.4	2.2±0.3	2.2±0.2	2.5±0.4*
Body mass, kg	72±4	73±3	77±4*	72±4

Notes: \* -  $P<0.05$ ; \*\* -  $P<0.01$ .

At the end of experiment girls of experimental group were confidently far ahead of his peers from control group in strength ( $P<0.01$ ), flexibility ( $P<0.01$ ) and endurance ( $P<0.05$ ). Body mass of experimental group's girls confidently reduced ( $P<0.05$ ). In control group the girls' body weight increased ( $P<0.05$ ). The girls' control tests results are given in table 2.

**Table 2.** Physical condition and physical fitness indicators of the tested girls

Physical qualities	Before experiment		After experiment	
	Control group	Experimental group	Control group	Experimental group
Strength (chin ups, q-ty of times)	12±2	11±2	14±2	24±3**
Flexibility (forward bents, cm)	9±3	10±2	10±3	15±4**
Quickness (100 meters' run, sec. )	16±2	17±3	15±3	14±2
Endurance (Cooper's test, km)	1.8±0.4	1.9±0.4	2.0±0.3	2.3 ±0.4*
Body mass, kg	55±3	56±2	58±3*	53±2*

Notes: \* -  $P<0.05$ ; \*\* -  $P<0.01$ .

### Discussion

The received data are interesting because they permit to objectively assess different programs of students' physical education. The results of the experiment coincide with the data of other studies [18, 24, 35]. The trainings by HOT IRON methodic demonstrate significant increment of students' physical strength and endurance. Increment of these indicators took place both in girls and boys. It permits to recommend such methodic for mixed contingent of trainees. Trainings based on traditional physical education programs (general physical training, sport and mobile games) do not permit to achieve significant results in training of physical qualities.

We registered disturbing tendency of body mass increase in control groups' students. The increase was in average from 3 to 4 kg. This tendency permits for the authors to agree with specialists' conclusions about insufficient effectiveness of the existing standard physical education programs for students [4, 9, 12, 36]. At classes

conducted by HOT IRON methodic demonstrate preservation of body mass at previous level or its reduction within body figure correction. It permits for the authors to agree with statements of other specialists about advantages of power-cardio and fitness training in students' health protection and obesity liquidation. Students' body mass increase in control groups can be explained by insufficient physical functioning of young people on physical culture trainings, conducted by traditional program.

Specialists note that students' technical fitness in sport games is insufficient. Teachers have to spend a lot of time for training of the simplest technical elements instead of sport perfection and increase of trainees' game experience [11, 24, 28]. That is why motor density of such trainings remains to be low and students' motor functioning – insufficient.

### Conclusions

The research permits to make the following conclusions:

1. Analysis of scientific data witnesses about substantial decrease of physical condition, physical fitness and health of most of modern young people. The sharpest threat, as considered by specialists, is deficit of youth's everyday motor functioning. The reasons of low physical functioning are: deficit of youth's motivation for regular practicing of physical exercises and absence of interest to acting in HEEs physical education programs.
2. For substantial increase of students' motivation for regular physical culture trainings at HEEs specialists recommend to apply new, effective forms and methods of physical education. Such methods can include students' physical culture trainings, based on power-cardio training. Successfulness of different fitness programs' application in students' health improvement is proved by domestic and foreign specialists.
3. For solution the problem of students' bad physical condition and health the author recommends to use HOT IRON exercises system at physical culture lessons in HEEs.

### Conflict of interests

The author declares that there is no conflict of interests.

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