

Means of optimal body mass control and obesity prophylaxis among students

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Abstract

Purpose: approaches to control over limits of students body mass range and obesity prophylaxis through their physical condition improvement are offered.

Material: in the research 100 boy students, divided into 2 equal groups (experimental and control) participated. Their age was – 19-20 years. In the research we used methodic of control over maximal admissible body mass. Strength was registered by quantity of chin ups. Endurance was assessed by time of 3000 meters' distance run. Quickness was assessed by time of 100 meters' distance run. Besides, we considered the quantity of missed physical culture lessons.

Results: it was found that for successful body weigh reduction students have to significantly increase everyday motor functioning. It was also found that insignificant quantity of missed physical culture lessons can not noticeably influence on students physical condition. At the end of the researches tests showed some increment of strength and quickness and confident increase of endurance in experimental group students.

Conclusions: implementation of compulsory body mass control methodic in students' physical education will facilitated overcoming global threats for youth's health: obesity and immobile way of life.

Keywords: health, motor functioning, students, body mass, obesity prophylaxis, physical culture.

Introduction

At present time significant progressing of young people's obesity is registered throughout the world. It results from deficit of modern youth's everyday physical activity. Immobile way of life and obesity growth in different age groups is rather serious problem in many developed countries [16]. Reduction of such negative tendency requires intensive efforts of medical workers, pedagogues and specialists in physical education [3]. Researches show that modern young people spend most of their time with computer instead of gyms [30, 32, 49]. Durable sitting at computer monitor results in sleep worsening, day fatigue and absence of steady motivation for active functioning during day. Excessive work with computer results in obesity and diseases of muscular skeletal apparatus [33, 49]. In modern health protection system there are two equal aims: increase of population's physical activity and reduction of time, spent at computer [13].

For medical workers the fact that physical functioning is effective, accessible and cheap mean of fighting different diseases has become evident long ago. Risk of diseases can be easily prevented by physical exercises' practicing [5, 24]. Warburton D. [51] points at direct linear connection between motor functioning and human physical health. Blair S. found significant reduction of cardio-vascular diseases, brain attacks, and cancer of colon risk as well as prolongation of life span. All these are facilitated by different motor functioning forms,

including cardio-respiratory fitness practicing [6]. Review of scientific works shows that scientists agree in determination of physical activity's leading role in health protection and improvement in all population strata [24, 27, 31]. However, it is necessary to admit that in modern scientific medium there are different views on ways of motor functioning intensification among students.

Some scientists offer to fight with students' excessive weight by means of special diets in students' eating in combination with physical culture and sports practicing [2]. In the opinion of L. Pescatello, reasonable combination of physical functioning and diets in students' everyday life will give more positive results, comparing with bare diets and uncontrolled sports practicing [42]. Grygiel-Górniak B. confirms that usual eating and physical activity influence health of modern young people [19]. Unfortunately only professional diet specialists can select correct rational eating for great number of young people. Their consultations are rather expensive for most of students. Staff structure of educational establishments does not stipulate such specialists. That is why it is very difficult for young people to organize correct balanced eating. Scientists note young people's uncontrolled and independent usage of different methodic for body mass reduction (diets, fasting, application of different medications), which are, sometimes, very dangerous for organism. In the opinion of B. Abalkhail, educational programs for youth shall contain information about correct and healthy eating, optimal body mass and dimensions, use of everyday physical activity, prophylaxis of clinical obesity [1]. In other works need in urgent use of educational preventive measures on formation of young

people's health culture and handsome body is noted [8, 45].

Specialists know that negative after effects of immobility can be removed by highly intensive trainings [28]. In the opinion of Bogdanis G., for this purpose, additional researches for finding optimal parameters of long, highly intensive trainings are required [9]. The author notes that it is necessary to more attentively regard the problems of such trainings safety. It will permit to exclude over-fatigue for different age groups of population and for students. In other studies it was shown that intensive physical loads strengthen students' health and facilitate their academic progress [17, 34, 46]. In application of such trainings it should be remembered that there is deficit of operative, reliable and informative methodic for control and assessment of loads intensity at physical culture lessons [7, 25].

Scientific researches show that physical health and functional fitness of most of students are not optimal for this category of population [38, 39, 47]. Specialists attract attention to wide opportunities for health improvement of this age and social group. Plotnikoff R. points that students are ideal targets for intervention of healthy life style values. The author thinks that most of time students are embraced by observation of different profiles medical workers; they have opportunity to use material base of health related resources (stadiums, swimming pools, simulators' halls); they are admitted to wide theoretical knowledge about health and ways of its strengthening [43]. It is even possible to create certain health medium on territory of educational establishments [36]. In L. Korn's opinion for students' health strengthening educational establishments shall use the following: accessible and healthy eating in canteens; practice great number of sport mass measures; apply effective screening systems. Besides, physical culture lessons shall be compulsory for young people to receive bachelor's degree [26]. King K. notes that when creating programs for increasing students' physical activity it is necessary to obligatory consider existing in students campuses conditions for sports and physical culture practicing [23]. The author thinks that one of serious problems in increasing students' physical activity is difficulty of objective comparison of different researches' results. Different specialists use in their works rather subjective indicators of young people's physical activity. In other work it is noted that fitness coaches and medical workers have different points of view on healthy life style values' implementation among students [12]. Substantial contradiction was found between declaration of constant affirmations about young people's healthy life style and absence of specially developed programs for physical culture classes. Kudryavtsev M. thinks that such programs shall be based on application of modern means of students' physical health improvement [29]. Such means can include cardio-power training, different martial arts, and fitness aerobic and so on. In other works successfulness of fitness training programs' application in students' physical education is proved [35, 40]. Some works show that students' physical activity programs

shall be built on the base of power trainings [20, 21, 50]. However there are significant contradictions in scientific medium concerning this idea. In L. Judge's opinion, construction of programs for students' physical activity shall be on the base of aerobic exercises [22]. The author affirms that easy admittance to sport facilities is an important step for higher fitness indicators of students. It should be admitted that admittance to sport facilities and their condition are not at proper level. It should be also noted that there are only a few programs on students' physical activity propaganda and their effectiveness is insufficient. Foreign scientists also note rather modest effect of physical activity and sports propaganda among young people [4]. Daskapan A. notes that many young people have psychological, social and personal barriers, preventing from regular physical exercises' practicing [14].

In our research we did not use methodic of students' body mass index (BMI) determination. It is connected with the fact that such methodic are rather subjective in assessment of optimal body mass and requires serious additional tests [10, 15, 41, 44].

Analysis of literature data shows that there are many points of view on solution of problem of students' physical health worsening. Such researches are often inconsistent and contradictory. That is why it is offered to concentrate efforts on solution of immobile way of life problem among young people and obesity prophylaxis.

Hypothesis: the author assumed that solution of problem of young people's excessive weight and obesity would be facilitated by including one more criterion in list of compulsory physical culture control tests: range of optimal body mass of students. The author thinks that control over limits of students' weight categories will permit to substantially increase everyday motor functioning of young people and their physical health. Application of this methodic contains an element of scientific novelty: analysis of scientific literature did not show any works, devote to control over weight categories' limits in students.

The purpose of the research: is to improve students' physical condition and health; prophylaxis of obesity emersion and progressing in students at the cost of control over weight range limits of students' body mass.

Material and methods

Participants: in the research 100 boy students, divided into 2 equal groups (experimental and control) participated. Their age was – 19-20 years. Selection of the participants was conducted, considering their body mass indicators. Weight range of all tested students was 78.4 – 84.5 kg. Mean body mass of the tested was 82.3 kg. All students – participants in the research gave their consent for participation in experiment.

Organization of the research: the researches took one academic year. For achievement of the set target experimental group students were offered to control body mass range during all experiment alongside with regular attendance of physical culture lessons. Maximal deviation

from actual body mass was admitted in the range from 1 to 1.3 kg. Control group students were not limited in control over their body mass. For them main condition was regular attendance of physical culture lessons. Before experiment at physical culture lessons all students were trained by traditional program. This program envisaged principles of main sport games' techniques (basketball, volleyball, football) and general physical training [48]. All students were offered to attend trainings by corrected physical education program during experiment. Specialists recommend to significantly intensifying young people's motor activity at the cost of aerobic physical exercises [4, 13, 16, 35]. Training program for the tested included: principles of hiking tourism and sport orientation; skiing; health related run; physical exercises for training main physical qualities. The main idea of the used exercises was increasing of movements' quantity of the tested.

In the course of experiment all students passed a number of tests for general physical fitness, which permitted to rather objectively assess their physical condition. Strength level was assessed by quantity of chin ups; endurance – by time of 3000 meters' distance run. Quickness was estimated by time of 100 meters' distance run. Besides, we considered total quantity of missed physical culture lessons.

Statistical analysis: was carried out with the help of SPSS20 program. Student's t-criterion was used for checking of mean values of two interconnected samples.

Results

Before experiment body mass indicators of experimental and control groups students were not confidently different. Weight range of control group students was 78.6 – 84.5 kg. Mean body mass was 82.2 kg. Weight range of experimental group students was 78.4 – 84.3 kg, with mean body mass value – 82.4 kg. At the end of experiment weight indicators of experimental and control groups students were confidently different. In

control group body weight confidently ($p<0.05$) increased (in average from 82.2 to 85.7 kg). Weight range of control group students was 82.4 – 88.6 kg. In experimental group, mean body mass value insignificantly reduced, comparing with the beginning of experiment (from 82.4 to 81.1 kg). Weight range of these students was 77.5 – 82.2 kg. It should be noted that 7 students from experimental group exceeded admissible maximal-minimal deviations from body mass (5 persons exceeded maximum and 2 – significantly reduced body mass). These students were excluded from further participation in the researches. But it did not influence significantly on results of the researches as far as quantity of the tested was rather big.

Results of control tests at the beginning of the researches sowed no confident prevalence of any physical quality in different groups. Students of experimental and control groups demonstrated approximately equal, rather moderate physical potential. At the end of the researches experimental group students confidently ($p<0.05$) increased their endurance and insignificantly increased strength and quickness. In control group we found confident ($p<0.05$) reduction of quickness and endurance and insignificant reduction of strength indicators. These results are given in table 1.

Discussion

From results of our research it is evident that most students' everyday physical functioning and eating are not sufficient for maintaining optimal body mass. Control group students demonstrated significant (in average by 3.5 kg) body mass increase during academic year. With it these students attended physical culture lessons regularly. The program of these lessons contained prevailing quantity of aerobic exercises. Many specialists recommend such exercises for prevention from immobility and obesity in young people [22, 35, 40, 42]. The quantity of missed lessons in average was составляет 3 ± 3 lessons in two semesters. Total quantity of physical culture lessons in

Table 1. Results of students' body mass studies

Physical qualities	Before experiment		After experiment	
	Control group	Experimental group	Control group	Experimental group
Strength (chin ups, quantity)	10±4	9±4	9±3	10±4
Quickness (100 meters' run, sec.)	13±0.8	14±0.2	15±0.8*	13±0.6
Endurance (3000 meters' run, min.)	13.26	13.41	14.48*	12.40*
Body mass, kg	82.2	82.4	85.7*	81.1
Missed lessons	-	-	3±3	3±2

Notes: * - $p<0.05$ – significance level.

academic year is 36. Such quantity of missed lessons can not influence significantly on students' general physical fitness. Therefore for obesity prophylaxis in modern students only physical culture lessons are quite insufficient. Additional, regular and durable physical exercises' practicing in free time is required. Insufficient physical functioning negatively influenced of these students' physical condition. At the end of the research we found in them certain weakening of strength and significant reduction of quickness and endurance.

Most of experimental group students succeeded in keeping the set body mass parameters: only 7 persons (from n=50) exceeded the recommended maximal-minimal limits of weight range (their own weight, which was at the beginning of experiment, by ± 1.3 kg). For achievement of proper results students had to significantly intensify their everyday motor functioning. Students noted that besides academic physical culture lessons the started to attend additional trainings in sport clubs and circles (in average 2 additional trainings a week) and increased the scope of their everyday motor functioning (morning exercises, morning and evening runs, walking and etc.). Increase of motor functioning significantly influenced on students' physical fitness level. At the end of the research control tests showed certain increment in strength and quickness and confident increase of endurance in experimental group. Correctness of such approach is proved also in other works [44, 47].

Experimental group students noted that they had to significantly expand their knowledge about healthy eating dietology and weight correction. All students mentioned that they regularly read scientific literature on such topics and tried to correct their everyday eating basing on acquired information. Students also noted that their usual eating regime and food significantly changed. The students changed the quantity and time of eating, increasing the quantity of eating periods (up to 5-6 a day). The students reduced calorific capacity and the volume of taken food. They started to drink 1.5-3 liters of purified water everyday, use vitamin complexes. Fulfillment of such simple and feasible recommendations played important role in maintaining optimal body mass. It should be especially noted that in our researches we set minimal admitted

threshold of body weight reduction. It is connected with the necessity to prevent from potentially dangerous body mass reduction means (fasting, medications, bio-adds and etc.). Thus, in this research we made an attempt to realize conception of eating culture among youth. Such approach is also proved in other researches [8, 26].

Conclusions

1. Analysis of specialists' scientific works in the field of health protection, medicine, sports and physical education permits to speak about significant worsening of most young people's physical condition and health. The main threats for students' health are: immobile way of life and obesity. Just to elimination of these global threats the works of scientists, dealing with students' health protection, shall be devoted.

2. In opinion of the most of scientists strengthening of students' health shall be facilitated by programs of increasing young people's physical functioning. Unfortunately it is necessary to admit that programs, offered by specialists are quite different. Some of them are rather contradictory and questionable. It was found that instructors of physical culture, medical workers, and coaches offer different approaches to cultivation healthy life style values in students' medium. Sometimes, such programs are rather subjective and inconsistent. Thus, there is high demand in objective programs of high quality for students' physical functioning intensification.

3. Implementation of criterion – optimal body mass indicator – in list of required for passing physical culture test requirements will be rather objective and simple mean of students' motor functioning intensification. In our research it was determined that for successful fulfillment of this condition students had to significantly increase their everyday motor functioning. Therefore, implementation of compulsory control over body mass in practice of students' physical education will facilitate fighting with global threats for young people's health: obesity and immobility.

Conflict of interests

The author declares that there is no conflict of interests.

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