

## PHYSICAL FITNESS OF STUDENTS WHO GO IN FOR BOXING IN THE PROCESS OF THEIR PHYSICAL TRAINING

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<sup>A</sup> Study Design; <sup>B</sup> Data Collection; <sup>C</sup> Statistical Analysis; <sup>D</sup> Manuscript Preparation; <sup>E</sup> Funds Collection

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**Abstract.** Physical and special physical fitness of first and second year students which go in for boxing in the process of their physical training during one and two years, respectively, is defined here. The research involved 108 students: 54 students from first year and 54 students from second year, which were tested during the year (at the beginning and at the end). The following types of testing were used: standing long jump, lying dip up for 20 sec and 1 min, speed – 100 m running, endurance – running 3000 m, rope jumping (quantity per 1 min) and special physical fitness was determined by maximum quantity of left and right punches during 15 sec. There positive dynamics and growth of all physical fitness indicators of students who went in for boxing during the first year was defined. The students who went in for boxing for the second year showed better results and their dynamics (in addition to indicators of 100 m running speed).

**Key words:** students, boxing, physical fitness

### Introduction

Evaluation of physical fitness of modern student youth in most cases shows low level of development (Bondarchuk 2004; Marchenko 2009). This is due to poor efficiency of physical training process arrangement and low motivation of the majority of students to work out and go in for sports.

The research (Khimich 2010; Konyk 2006; Malimon 1999; Marchenko 2009; Vykhlyayev 2012) showed that an approach based on division by groups according to the interest in sports increases motivation to training, impacts on the consistent attendance, and increases physical fitness.

As a method of forming special movement skills of student youth, some higher educational institutions offer boxing as a part of their physical training lessons. Boxing promotes comprehensive physical training. Performance of boxing moves requires all movement capacities, all properties of locomotor system.

Boxing is one of the most effective physical training for the bodies of those who go in for it. Physical exercises are used as physical training means.

General training exercises. These include the exercises of comprehensive impact on the boxer's body, they promote formation of a wide range of movement skills: gymnastic routine, exercises from other sports – running, jumping, sport games, bar, swimming, etc.

Special – conditioning exercises. This group is peculiar for substantial similarity in special features, which develop nervomuscular efforts with the help of special punching, defensive and other actions of the boxer. Those include exercises with loads. Moreover, exercises of special conditioning group also include a set of gymnastic exercises with analogical structure and pattern of nervomuscular efforts, but which are performed without loads.

Special fighting exercises are performed by the boxer in simulated fight, sparring, and competitive fights. Those also include exercises for improvement of technique and tactics when working in pairs.

Positive influence of boxing training on development of movement and mental functions, development of moralities, endurance and stamina allows us to treat boxing not only as a sport but as a powerful method of physical training and development of student youth identities (Hradopolov 1951).

Boxing is an accessible sport, since it does not limit possibilities of those practicing it. This sport is an efficient method of all-round physical development and physical preparation (Dilenyan 2002; Krylovskiy 2010).

Physical preparation in boxing likewise in other sports is a basis for achieving high sport results. It is peculiar for a certain level of physical qualities development, as well as forms and functions of the boxer's body. The stronger and more capable the body is, the better it picks up training loads, gets used to them more quickly and remains trained longer. Without good physical fitness in terms of a fight, no effective and extended in time revelation of technical, tactical and mental skills and qualities of the boxer may be possible. That's why physical preparation combined with the process of the boxer's technique and tactics elements is one of the main components of the training in general (Dehtyaryov 1979).

By the degree of revelation of leading moving abilities and modes of activity of the body, boxing falls into the sports with comprehensive revelation of moving abilities: here, most actions have brightly shown speed-power trend against special endurance. That's why special attention must be paid exactly to development of these moving abilities.

Process of training specialization in boxing involves both special exercises and general developmental exercises. Specialization of general development exercises is made by way of approximating them to competition exercises not so much by form as by pattern of nervomuscular efforts, working mode and other parameters.

Based on the above, the purpose of the research was established as follows: to trace dynamics of physical preparation and special physical fitness of first and second year students, and determine impact of boxing in the process of their physical training upon formation of special moving skills of the students.

## Methods

Testing took place at the Department of Physical Training of the interuniversity faculty of medicine and engineering of the NTUU "KPI". The research involved 108 students: 54 students from first year and 54 students from second year, which were tested during the year (at the beginning and at the end). This research made it possible to evaluate general and special physical fitness of students which go in for boxing in the process of their physical training during one and two years, respectively. To evaluate physical fitness of the students the following

tests were used: explosive strength – standing long jump as indicators of take-off force. When evaluating arm strength, speed-power lying dip up was used during 20 sec. The same exercise but performed during 1 minute was used to evaluate strength endurance (Koptsev 1984).

These types of tests were suggested due to the fact that leg muscle strength and arm triceps strength in no small degree defines efficiency of punches during the fight.

A separate qualifying standard was rope jumping (quantity per 1 min) and determination of maximum quantity of left and right punches during 15 sec.

Speed fitness and endurance were defined with the help of maximum loads (up to 20 sec) – 100 m running and high physical load (up to 30 min) – 3,000 m running (Koptsev 1984).

Average statistical data of the research conducted, physical fitness of the students are set forth in the Table 1.

**Table 1.** Physical fitness of students of NTUU "KPI" who go in for boxing in the process of their physical training

Test types	At the beginning of experiment		At the end of experiment		p	
	I – year $\bar{X} \pm S_x$	II – year $\bar{X} \pm S_x$	I – year $\bar{X} \pm S_x$	II – year $\bar{X} \pm S_x$	I – year	II – year
Lying dip up during 20 sec, times	28.77 ±0.51	30.09 ±0.51	29.75 ±0.36	31.16 ±0.35	p < 0.05	p < 0.05
Lying dip up during 1 min, times	50.22 ±1.83	54.66 ±1.33	52.11 ±1.60	56.55 ±1.26	p < 0.05	p < 0.05
Left punches per 15 sec, times	53.53 ±1.08	57.29 ±1.22	56.51 ±1.01	60.38 ±1.12	p < 0.05	p < 0.05
Right punches per 15 sec, times	57.03 ±1.21	60.29 ±1.27	59.62 ±1.06	63.03 ±1.10	p < 0.05	p < 0.05
Standing long jump, cm	212.85 ±3.49	219.81 ±2.41	217.12 ±3.20	225.20 ±1.94	p > 0.05	p < 0.05
Running – 100 m, sec	13.80 ±0.07	13.67 ±0.07	13.71 ±0.07	13.76 ±0.08	p > 0.05	p < 0.05
Running – 3,000 m, min	13.34 ±0.11	13.26 ±0.12	13.23 ±0.08	13.09 ±0.10	p > 0.05	p < 0.05
Rope jumping during 1 min, times	95.07 ±3.93	112.48 ±3.80	100.83 ±3.41	118.64 ±3.37	p < 0.05	p < 0.05

## Discussion

Muscle strength is one of the boxer's most important physical qualities. Muscle strength in no small degree defines movement speed, as well as endurance and agility. Strength qualities of student boxers were tested with the help of the following exercises – lying dip up during 20 sec and during 1 min, respectively. During the year, first year students enhanced their result from 28.77 to 29.75 times, second year students enhanced their results from 30.09 to 31.16 times during 20 sec and first year students enhanced their results from 50.22 to 52.11 times, second year students enhanced from 54.66 to 56.55 times during 1 min. Reliability of both first and second year students results is  $r < 0.05$ . The analysis of data obtained allows us to say that boxing promote strength qualities.

Special physical fitness was defined with the help of 15 second punching test first with left hand and then with right hand. Obtained results showed developments, first year students from 53.53 to 56.51 times, second year students from 57.29 to 60.38 times with left hand and first year students from 57.03 till 59.62 times, second year students from 60.29 to 63.03 times with right hand. Reliability of both first and second year students results is  $r < 0.05$ .

Testing of explosive strength which reveals itself in the ability of muscles to develop considerable tension for minimum time and which is peculiar for correlation between maximum effort and time taken to achieve it, showed growth of the long jump results during the first year from 212.85 cm to 217.12 cm during the second year from 219.81 cm to 225.2 cm. First year results  $r > 0.05$ , second year results  $r < 0.05$ .

Action speed in boxing is essential, often decisive to be ahead of the opponent's punch, defend from the punch before the opponent attacks. Therefore, in boxer's training important place is held by the development of movement and action speed. To evaluate speed qualities, time shown on a 100 m distance was measured. Average indicators revealed a bit different dynamics of development; hence the first year results enhanced from 13.8 sec to 13.71 sec and the second years became worse, from 13.67 sec to 13.76 sec. First year result is  $r > 0.05$ , second year's result is  $r < 0.05$ .

When defining endurance degrees (3,000 m running) which may be described as an ability to resist fatigue, the following results were obtained: average indicator of the first year students enhanced from 13.34 min to 13.23 min, second year's from 13.26 min to 13.09 min. First year's result reliability was  $r > 0.05$ , second year's  $r < 0.05$ .

Check of agility with the help of a rope also showed uncommon growth of the first year from 95.07 to 100.83, second year from 112.48 to 118.64. Reliability of both first and second year students results was  $r < 0.05$ .

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**Cite this article as:** Tkachuk V., Nazymok V. Physical fitness of students who go in for boxing in the process of their physical training. *Centr Eur J Sport Sci Med*. 2014; 8 (4): 83–86.