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**INFLUENCE OF THE USE OF SPECIAL EXERCISES ON THE
PSYCHOPHYSIOLOGICAL INDICATORS OF YOUNG BOXERS AGED 15-
16 YEARS OLD**

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Purpose: to determine the effectiveness of the use of special exercises using boxing equipment during a one-year macrocycle in young boxers 15-16 years old.

Material and methods: the research was carried out with the involvement of young boxers 15-16 years old, who made up the control (12 athletes) and experimental (12 athletes) groups, who carried out a year-long training process according to the CYSS program, but in the experimental group at the end of each training exercise using boxing equipment (exercises with a bag and a pear, with a wall pillow; pneumatic bag; exercises with a ball on elastic bands; exercises with a small hanging ball). The initial and final measurements of psychophysiological parameters were carried out after training with a high load, which was used in boxers of both groups.

Results: the results obtained make it possible to expand the methodology of using special exercises for the development of speed-strength qualities in accordance with the specificity of the sport. The expediency of using exercises of a special speed-strength orientation in young boxers of 15-16 years old at the end of a training session, against the background of fatigue, has been determined.

Conclusions: the improvement of the results of psychophysiological indicators, which are the components of the motor activity of boxers (the time of a simple reaction to sound and light; Romberg's test, indicators of the Schulte test, concentration and switching of attention according to the Bourdon test) was confirmed.

Keywords: young boxers, psychophysiological indicators, special boxing equipment, speed- strength qualities.

Introduction

Physical training of a boxer is the main factor ensuring the quality of technical, tactical and psychological readiness, the level of development of all other components of mastery [1, 4, 15].

The methodology for the development of speed-strength qualities is associated with the provision of the necessary functional preparation of the body for the improvement of technical and tactical skills and a systematic increase in the speed of a competitive exercise. Special studies [2, 10, 14] indicate the inconsistency of the opinions of coaches in various sports on the training impact of the most popular means of special physical training (SPT). Obviously, the reason for this situation lies in the lack of knowledge about the physiological mechanisms that underlie the athlete's special working capacity and the means that determine the training effect. [3; 6; 7].

Today athletes widely use competitive exercises with high labor intensity in training [8]. Along with other and no less important advantages, this technique acts as a very effective means of SPT, since it is difficult to come up with something more special in this regard. Therefore, the performance of a competitive exercise in training with the maximum intensity of efforts and high speed is an important means of the SPP system, but requires scientific and methodological substantiation. [13].

According to the degree of conformity of the mode of work of the organism when performing a competitive exercise, it makes sense to distinguish three groups of means of SPT [12; 18]: specific - different forms (variants) of the main sports

exercise fulfillment with the task of adapting the organism to the mode of its work in the conditions of competition; specialized - adequate competitive conditions for the most essential motor and functional parameters of the body's working regime; nonspecific - formally do not correspond to the competitive right in terms of motor organization, but contribute to the development of the body's functional capabilities in the right direction; their task is to enhance the training effect of specialized means through additional selective impact on certain physiological systems and body functions.

In practice, when selecting SPP funds, one should be guided by the principle of dynamic compliance [5; 9; 17], according to which they should be adequate to the competitive exercise according to the following criteria: muscle groups involved in work, amplitude and direction of movement; the section of the amplitude of movement is emphasized; the amount of effort and the time of its development; speed of movement, mode of muscle work. Based on these criteria, the starting position, the kinematic scheme of movements, the amount of external resistance, the nature of the manifestation of efforts, and, finally, the method of exercise are determined [12; 16].

In turn, P. Anokhin determines that the most effective is the use of special preparatory exercises, which in the structure of movements correspond to the competitive right.

Purpose of the study: to determine the effectiveness of the use of special exercises using boxing equipment during a one-year macrocycle in young boxers 15-16 years old

Material and methods

In our studies, we supplemented two more provisions on the advisability of using special exercises, which also reproduce not only the structure of movements, but also the structure of efforts, as well as the influence of special exercises for the formation of a functional system (cardiovascular, respiratory, neuromuscular), which provides competitive activity in the chosen sport. It is the selection of speed-strength exercises of boxers to solve these issues that is relevant in sports training.

In this regard, the use of speed-strength exercises with the use of special devices will help improve psychophysiological indicators and contribute to the formation of special preparedness.

Results of the research

The main feature of the experimental methodology was the use of special exercises that form the boxers' motor actions at the end of the training session. This is due to the fact that it is very important for boxers at the end of the fight to show speed and power qualities that affect the determination of the winner. Therefore, it is the use of special exercises at the end of training against the background of fatigue that forms the manifestation of special speed-strength qualities, in terms of the structure of movements, the structure of efforts and the formation of a functional system specific to boxing, is an effective scientific research. The scientific studies presented earlier [11] made it possible to determine the influence of the indicated special boxing equipment on the indicators of general physical fitness, during which their influence on psychophysiological indicators was determined.

Table 1

**Psychophysiological indicators of the control group
at the beginning and at the end of the annual macrocycle (n1=n2=12) $\bar{x}\pm m$**

№ i/o	Indicators	At the beginning	At the end	Reliability assessment	
				t	p
1	Rufier index, c.u.	7,92±0,26	7,01±0,24	1,17	>0,05
2	Romberg test, s	13,6±0,32	14,8±0,43	2,26	<0,05
3	Time of simple reaction to sound, s	0,35±0,03	0,31±0,03	1,00	>0,05
4	Selection response time, s	1,25±0,10	1,21±0,07	0,37	>0,05
5	Time of simple reaction to light, s	0,37±0,04	0,35±0,03	0,40	>0,05
6	Efficiency of work on the Schulte test, c.u.	7,04±1,46	67,5±1,32	1,48	>0,05
7	Schulte test level, c.u.	1,01±0,6	0,92±0,05	1,15	>0,05
8	Mental stability according to the Schulte test, c.u.	0,92±0,05	0,88±0,05	0,57	>0,05
9	Concentration of attention according to the Bourdon test, c.u.	236,6±5,10	252,6±5,46	2,07	>0,05
10	Switching attention with the Bourdon test, c.u.	35,4±1,12	32,5±1,08	2,19	<0,05
11	Tapping test, frequency of movements, (number of times)	4,62±0,15	4,78±0,16	0,79	<0,05

Testing of psychophysiological indicators at the beginning of the annual macrocycle in the control and experimental groups did not reveal a significant ($p>0,05$) difference between the study groups. The conducted summer training process of young boxers 15-16 years old in the control group according to the CYSS program had a positive effect on the formation of psychological indicators, but significant shifts were obtained in the indicators of the Romberg test ($t=2,26$; $p<0,05$) and switching attention according to the Bourdon test ($t=2,19$; $p<0,05$).

Table 2

Psychophysiological indicators of young boxers 15-16 years old of the experimental group at the beginning and at the end of the annual macrocycle (n1=n2=12) $\bar{x}\pm m$

№ i/o	Indicators	At the beginning	At the end	Reliability assessment	
				t	p
1	Rufier index, c.u.	7,44±0,25	6,94±0,23	1,17	>0,05
2	Romberg test, s	13,1±0,33	15,5±0,45	4,29	<0,01
3	Time of simple reaction to sound, s	0,34±0,04	0,23±0,02	2,44	<0,05
4	Selection response time, s	1,27±0,08	1,00±0,06	2,70	<0,05
5	Time of simple reaction to light, s	0,35±0,03	0,27±0,02	2,22	<0,05
6	Efficiency of work on the Schulte test, c.u.	69,5±1,35	62,1±1,21	4,09	<0,01
7	Schulte test level, c.u.	1,03±0,06	0,78±0,04	3,47	<0,01
8	Mental stability according to the Schulte test, c.u.	0,94±0,05	0,74±0,04	3,13	<0,01
9	Concentration of attention according to the Bourdon test, c.u.	238,8±5,04	271,6±5,01	4,62	<0,001
10	Switching attention with the Bourdon test, c.u.	34,8±1,12	28,7±1,02	4,04	<0,01
11	Tapping test, frequency of movements, (number of times)	4,60±0,15	5,06±0,17	2,00	>0,05

But at the end of each lesson, the use of special speed-strength exercises at the end of the study allowed young boxers 15-16 years old in the experimental group in terms of: Romberg's test for 2,4 s ($t=4,29$; $p<0,01$), time simple reaction to sound at 0,11 s ($t=2,44$; $p<0,05$), response time of choice at 0,27 s ($t=2,70$; $p<0,05$) time of simple reaction to light at 0,08 s ($t=2,22$; $p<0,05$) efficiency of work according to the Schulte test at 7.4 c.u. ($t=4,09$; $p<0,01$); the degree of workability according to the Schulte test by 0.25 c.u. ($t=3,47$; $p<0,01$); mental stability according to the Schulte

test at 0,20 c.u. ($t=3,13$; $p<0,01$); concentration of attention according to the Bourdon test at 32.8 c.u. ($t=4,62$; $p<0,001$); switching attention with the Bourdon test to 3.4 c.u. ($t=2,19$; $p <0,05$) (Table 2).

Comparison of psychophysiological indicators of young boxers 15-16 years old of the studied groups at the end of the annual macrocycle, which were determined after the same load in the groups, indicates the effectiveness of using special exercises at the end of training.

So, according to most indicators, the best results were obtained in the time of a simple reaction to sound ($t=2,22$; $p<0,05$), the response time of choice ($t=2,33$; $p<0,05$), and the time of a simple reaction to light ($t=2,22$; $p<0,05$), work efficiency according to the Schulte test ($t=3,02$; $p<0,05$), the degree of workability according to the Schulte test ($t=2,19$; $p<0,05$), mental stickiness according to the Schulte test ($t=2,14$; $p <0,05$), attention concentration according to the Bourdon test ($t=2,58$; $p <0,05$), attention switching with the Bourdon test ($t=2,21$; $p<0,05$).

Table 3

Psychophysiological indicators of young boxers 15-16 years old of the control and experimental group at the end of the annual macrocycle ($n_1=n_2=12$) $\bar{x}\pm m$

№ i/o	Indicators	Control group	Experimental group	Reliability assessment	
				t	p
1	Rufier index, c.u.	7,01±0,24	6,94±0,23	0,21	>0,05
2	Romberg test, s	14,8±0,43	15,5±0,45	1,11	>0,05
3	Time of simple reaction to sound, s	0,31±0,03	0,23±0,02	2,22	<0,05
4	Selection response time, s	1,21±0,07	1,00±0,06	2,33	<0,05
5	Time of simple reaction to light, s	0,35±0,03	0,27±0,02	2,22	<0,05
6	Efficiency of work on the Schulte test, c.u.	67,5±1,32	62,1±1,21	3,02	<0,05
7	Schulte test level, c.u.	0,92±0,06	0,78±0,04	2,19	<0,05
8	Mental stability according to the Schulte test, c.u.	0,88±0,05	0,74±0,04	2,19	<0,05
9	Concentration of attention according to the Bourdon test, c.u.	252,5±5,46	271,6±5,01	2,58	<0,05
10	Switching attention with the Bourdon test, c.u.	32,0±1,08	28,7±1,02	2,21	<0,05
11	Tapping test, frequency of movements, (number of times)	4,78±0,16	5,06±0,17	1,22	>0,05

Thus, after the introduction of the experimental methodology for most of the psychophysiological indicators, the best results were obtained in young boxers, they used special training means at the end of training against the background of fatigue.

Conclusions / Discussion

The results obtained make it possible to expand the methodology of using special exercises for the development of speed-strength qualities in accordance with the specificity of the sport. The expediency of using exercises of a special speed-strength orientation in young boxers of 15-16 years old at the end of a training session against the background of fatigue was determined. This is confirmed by the results of the improvement of psychophysiological indicators, which are components of the motor activity of boxers (time of simple reaction to sound and light; Romberg's test, indicators of the Schulte test, concentration and switching of attention according to the Bourdon test).

Prospects for further research provide for determining the influence of this technique on the results of testing special motor qualities and their correlation dependence with psychophysiological qualities.

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