

## Dynamics of functional status in young boxers after the means of recovery

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**Abstract.** *The purpose of the article is to substantiate changes in the functional status (FS) of young boxers aged from 12 to 13 and from 14 to 15 years under the effect of means of recovery (RM) during their preparation for competitions. Materials and methods. Two groups of boxers of the 1<sup>st</sup> and 2<sup>nd</sup> categories aged 12-13 and 14-15 years were formed. A course of means of recovery was used, which included sports massage and relaxation breathing exercises. The studies were carried out using the Omega-Sport diagnostic equipment. Based on the comprehensive medical reports, the results were obtained on patented integrated indicators. Results. During the experiment, positive dynamics in the functional status of young boxers in terms of integral indicators (adaptation to physical activity, physical fitness, energy metabolism, psycho-emotional status, the integral "Health" indicator) was established. Conclusion. The data obtained allow us to talk about the effectiveness of the means of recovery and the possibility of their further application for young boxers.*

**Keywords** - functional status of young boxers, means of recovery, boxers, adaptation.

### I. INTRODUCTION

The issue of the functional status of young athletes as a result of the application of means of recovery is still relevant for modern sports [2, 5]. A significant amount and intensity of training loads during preparation for competitions require an intensive search for means of recovery to optimize the training process [1, 3, 4].

### II. MATERIALS AND METHODS

The study involved young athletes at the Olympic Boxing Training Center. During preparation for competition, two groups of boys were formed: the 1<sup>st</sup> group included the boys aged 12-13 years ( $n = 15$ ), and the 2<sup>nd</sup> group consisted of the boys aged 14-15 years ( $n = 15$ ). All boxers have 1 and 2 youth sports rank and sports experience of three years. We have applied a comprehensive one-month recovery course, which includes: sports massage, ALL-700 multifunctional thermotherapeutic bed-massager, and relaxation breathing exercise from the Tai Chi Chuan system (every day in the final part of the training session). The studies were carried out using the Omega-Sport diagnostic equipment [6]. Based on the comprehensive medical reports, the results were obtained on patented integral indicators (Tables 1 and 2).

### III. RESULTS AND DISCUSSION

**A. Adaptation to physical activity:** before the course of means of recovery, the average group indicator in boys aged 12-13 years was  $75.20 \pm 3.93\%$ , and in boys aged 14-15

years -  $71.67 \pm 3.54\%$ . These data allow us to conclude that before the course, adaptation to physical activity was normal in both groups. Tables 1 and 2 show that after the course of means of recovery, the indicators increased by 8.87% in the group of boxers aged 12-13 years and by 5.9% in the group of boxers aged 14-15 years. At the same time, in 30% of the boys, adaptation to physical loads increased by 25%. The data obtained confirm that adaptation to physical activity increased to the maximum level in the group of boys aged 12-13 years and approached the maximum (80 - 100%) in the group of boys aged 14-15 years.

**B. Physical fitness:** the average group indicator in the 1<sup>st</sup> group was  $77.33 \pm 4.54\%$  and in the 2<sup>nd</sup> group -  $75.33 \pm 1.16\%$ . After the course of means of recovery, positive dynamics in the 1<sup>st</sup> group was 9.83% and in the second group - 6.4%. This confirms the change in the level of physical fitness from medium to higher.

**C. Energy supply:** indicators in the 1<sup>st</sup> group were  $69.27 \pm 4.29\%$  and in the 2<sup>nd</sup> group -  $61.93 \pm 3.16\%$ . This means that the body's energy resources before the course in the 1<sup>st</sup> group were close to the lower limit of reference values, and in the 2<sup>nd</sup> group they were below reference values. After the course, these indicators increased by 10.46% in the 1<sup>st</sup> group and by 9.37% in the 2<sup>nd</sup> group. In 30% of the young athletes, the data confirm an increase in energy supply and body resources from the lower level of reference values to the upper and maximum level.

**D. Psycho-emotional status:** before the course of means of recovery, the indicators of the 1<sup>st</sup> and 2<sup>nd</sup> group were  $68.20 \pm 4.62\%$  and  $63.33 \pm 3.54\%$ , respectively. This indicates a normal psycho-emotional status of athletes from both groups, normal activity in the 1<sup>st</sup> group and reduced activity in the 2<sup>nd</sup> group. After the course of means of recovery, positive dynamics was recorded in both groups: the 1<sup>st</sup> group - by 12.20%, the 2<sup>nd</sup> group - by 9.00%. The data confirm the improvement of the psycho-emotional status in athletes aged 12-13 years to excellent, and in athletes aged 14-15 years to good. The indicators of activity increased in the 1<sup>st</sup> and 2<sup>nd</sup> group to a high and normal level, respectively.

TABLE I. DYNAMICS OF FUNCTIONAL STATUS IN YOUNG ATHLETES AGED 12-13 YEARS

Indicators	Before the course of RM M ± m	After the course of RM M ± m
A, adaptation to physical loads, %	75.20 ± 3.93	84.07 ± 3.70
B, physical fitness, %	77.33 ± 4.54	87.13 ± 3.62
C, energy metabolism, %	69.27 ± 4.39	79.73 ± 3.77
D, psycho-emotional status, %	68.20 ± 4.62	80.40 ± 3.23
Health, %	72.07 ± 4.24	84.71 ± 2.72

**Health** is an integral indicator of physical performance: the average group indicator before the course in the 1<sup>st</sup> group was 72.07 ± 4.24% and in the 2<sup>nd</sup> group - 67.93 ± 3.23%. After the course of means of recovery, positive dynamics was also observed in 11% of athletes from the 1<sup>st</sup> group and in 10.2% of athletes from the 2<sup>nd</sup> group. At the same time, in 35% of the 1<sup>st</sup> group the indicator increased to 30%, and in 24% of the 2<sup>nd</sup> group - to 18%.

TABLE II. DYNAMICS OF FUNCTIONAL STATUS IN YOUNG ATHLETES AGED 14-15 YEARS

Indicators	Before the course of RM M ± m	After the course of RM M ± m
A, adaptation to physical loads, %	71.67 ± 3.54	77.60 ± 3.27
B, physical fitness, %	75.33 ± 4.01	81.73 ± 3.23
C, energy metabolism, %	61.93 ± 3.16	71.27 ± 3.70
D, psycho-emotional status, %	63.33 ± 3.54	72.33 ± 3.08
Health, %	67.93 ± 3.23	78.13 ± 3.31

#### IV. CONCLUSION

The results obtained show that the use of means of recovery in both groups resulted in positive dynamics of the functional status of athletes according to the integral indicators. This allows us to talk about the effectiveness of means of recovery themselves and their correct ratio. As a result of the use of means of recovery, in the 1<sup>st</sup> group, there was an increase in adaptation to physical activity to the maximum values, and, in the 2<sup>nd</sup> group, this indicator approached to the maximum value. In both groups, the indicator of physical fitness increased from medium to higher. Energy metabolism in boxers has grown from lower reference values to normal values. The use of means of recovery improved the psycho-emotional status from normal to excellent in the 1<sup>st</sup> group and from low to good in the 2<sup>nd</sup> group. The increase in the Health indicator in both groups confirms the improvement of the functional status of young boxers after the application of comprehensive means of recovery.

#### REFERENCES

- [1] Aminov A.S., Kokin V.Yu., Leshukov V.S., Shakhovskiy A.P. Boxer's readiness to a fight in the deficiency of time. *Human Sport Medicine*, 2018, 18(S), pp. 120-124.
- [2] Bleer A. N. Psychological factors of ensuring stability of psychomotor actions in single combats. *Theory and practice of physical culture*. 2006. No. 6. - Pp. 28-31.
- [3] Kharitonova L. G. types of adaptation in sport: monograph. Omsk: Sibgufk publishing House, 2016. 256 p.
- [4] T. V. Potapova, Yu. N. Romanov Retrospective analysis, problems and prospects of system formation in progressive training of young athletes. *Topical issues of rehabilitation treatment: Collection of works dedicated to the 5th anniversary of the Department of physical therapy, sports and rehabilitation medicine, cultural studies and physiotherapy*. - Chelyabinsk: Chelgma, 2008. - 148 p.
- [5] Surina-Marysheva E.F., Malkov, V.P., Yermolaeva, E.N. Sensomotor integration features in skilled female boxers. *Journal of Physical Education and Sport*, 2016. Vol. 16 (1). Pp. 24-27
- [6] System of complex computer research of physical condition of sportsmen «Omega-Sport». User documentation. - SP-b., 2012.