Weight-height indicators of heavyweight boxers as the most important component of planning and implementation of the training process

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Abstract

The purpose of the article is to justify the need for improvements in the methodology for training heavyweight boxers based on group individualization of the training process that takes into account the weight- height performance and the degree of influence of the body weight of boxers on the level of physical, technical and functional readiness. It seems appropriate to consider the facts found in the literature on the effect of body weight on the level of preparedness and training of athletes. Reflection of attitudes on the problem of individualization of training of athletes depending on their own weight necessitated a questionnaire survey. Analysis and synthesis of literature on the subject under study allows us to conclude that, along with very valuable facts regarding the identification of significant differences in the level of physical and functional fitness among athletes of different weight categories, the whole training method for boxers in heavyweight categories is still far from being resolved.

Keywords: heavyweight boxers, training process, weight- height indicators, athletes, methods.

Introduction

The problem of training domestic boxers o fheay weight categories in modern boxing is extremely relevant, drop-off boxers of light and medium weight categories, heavyweight boxers cannot boast of such number of ascensions on the highest step of a podium of the Olympic Games and World Championships, which to a certain extent is explained by an imperfect technique of their training.

Seeking effective ways to improve the level of sportsmanship ofheavy weight boxers is one of the most pressing problems in boxing. This problem is still undeveloped. There is only fragmentary information concerning some features of training heavy weights, on the basis of which it is impossible to develop an effective methodology for their training.

Suffice to say that so far the planning and conduct of the training process for heavyweight boxers is carried out according to the general system adopted for athletes of all weight categories, whereas the current level of athletic achievements dictates the need to study and assessment of all systems of athletes in their relations, as well as individual characteristics and their impact on athletic performance. In this regard, among the many indicators of the individual characteristics of the athletes's body of great interest are anthropomorphologicalfeatures and, particularly, body weight.

Purpose of the study - to study and experimentally prove the influence of the weight-height indicators of heavyweight category boxers on the training process.

Methodology and commissioning of the research

It seems appropriate to consider the facts found in the literature on the effect of body weight on the level of preparedness and training of athletes.

Reflection of attitudes on the problem of individualization of training of athletes depending on their own weight necessitated a questionnaire survey.

The questionnaires allowed toclarify the specifics of the training process, taking into account the weight-height indicators that are leading in the training of highly skilled heavy and super heavyweight boxers. So, respondents ranged them on importance degree as follows (Fig.1)
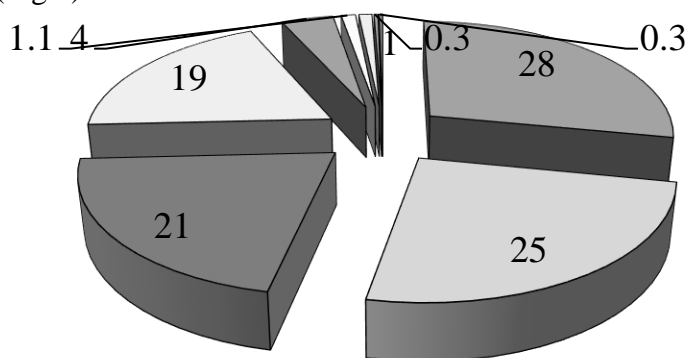

Fig. 1. Ranging weight – height indicators on their importance in educational and training process of boxers of heavyweights

1) Height (28%);
2) Weight (25%);
3) Length of arms (21%);
4) Length of legs (19%);
5) Chest (4%);
6) Shoulder grasp (1.1%);
7) Hip grasp (1%);
8) Forearm grasp (0.3%);
9) Shin grasp (0.3%).

One of the main tasks of the questionnaire survey was to identify the attitudes of coaches to the problem of differentiation of the training process. Pointed to the question "What do you think about differentiation in the training process" 96% of respondents indicated that it is not needed in training activity and 4% is needed.

At the same time, to the question "Do you differentiate the means and methods of training of boxers considering their weight category?" 88.3% of respondents answered that they do not use differentiation, and 11.7% use it. What is more, the 80.4% of respondents indicate anthropometric indicators of an athlete as a sign of differentiation of the training process, 12.3% indicate the level of physical fitness, 6.6% indicate differences in the indicators of their physical development, and 2% indicate other signs.

At the same time, Geroyan, G.O. [3] find out that one of the most important characteristics of athlete's preparedness is the level of development of physical qualities. Numerous studies have established that with the same level of fitness, people of greater weight can show greater absolute strength [1,4,7].The dependence between strength andown weight is shown more accurately, than qualification of the athlete is higher[2,4,5]. The absolute power abilities of athletes tend to increase with an increase in the body weight of athletes. At the same time, the magnitude of the force per unit of weight decreases noticeably with an increase in the upper bounds of the weight categories of athletes [3,4].

So, it has been established that as the weight categories grow from the lightest to the super heavy weight, the boxers showed an increase in absolute and a decrease in the relative
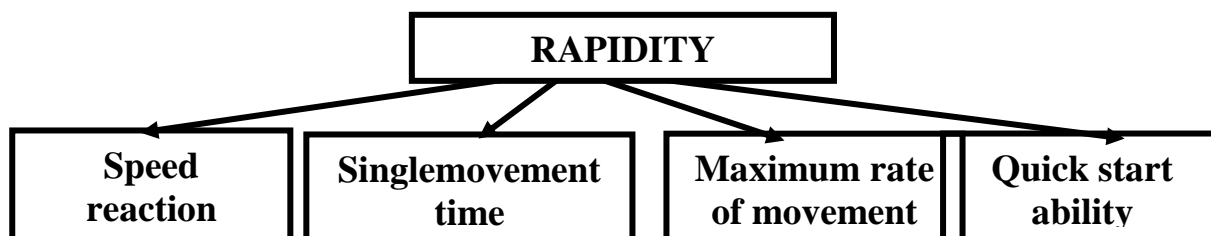
strength of the leading muscle groups.The relative strength of the muscles of the athletes till average weight was greater than the relative strength of the same muscle groups of boxer heavier weight categories [6].An increase in the maximum impact force with an increase in the weight category of boxers is shown. In the studies conducted by using of a special force dynamometer it is revealed that the average impact force of the boxer in the 10-second test, in a round and the test 3 rounds 3 minutes is higher at boxers of heavyweight in comparison with other weight categories [2].

Strength and speed-strength training of boxers has diametrically opposed dependencies on morphological features. If with the increase in the size of the athlete's body all proper-strength indicators increase, the speed-strength decreases.

Boxers of light-weight compared with the heavier level of speed-strength qualities are higher in movements associated with the movement of significant masses of his own body. At the same time, when choosing the same effort, boxers of different weight and height groups show different speed of increase of force from zero to maximum.

Boxers of light weight categories surpass the colleagues of middle and heavy weight. For its part, the heavyweight's boxers are inferior in these indicators to middleweights.

In the works describing influence of body weight on speed manifestation brightly 4 forms of its manifestation are allocated [2,6]. (Fig 2).

Elementary forms of manifestation of speed are relatively independent from each other. Particularly in the case of indicators of reaction of time which in most cases do not correlate with indicators of speed of the movement. It is possible to differ in very fast reaction be relatively slow in movement and vice versa [3].

A number of authors attempts to detect interrelations between indicators of speed and the total body size. The early researches results were contradictory. So, measuring time of response to a sound signal, found out the heaviest athlete had longest result from seven surveyed. But it was shown that tall people spend more time on the performance of the motor component of visual-motor reactions and the implementation of the fastest possible simple coordination of movement associated with a change in the direction of motion.

Such indicator of elementary forms of manifestation of speed as the speed of the single movement also turned out to be independent of the weight- height signs of athletes. However, if large masses of one's own body are involved in the movement or burdens are used, the body weight can influence the speed of movement. So, in work [3] it is established that:

1   when performing motor tasks associated with the movement of significant masses of their own bodies, athletes with significant values of weight and body length are slower performing the experimental task;
2   athletes with different total sizes of a body are capable to carry out movements with an identical frequency;
3   athletes who have a great body weight, slowly performs a single movement with small weights.

Unfortunately, the effect of body weight on the speed of boxer strikes has not been studied. Instead in relation to the frequency of strikes obtained conflicting information. Most

of the works showed that the frequency of strikes in the process of competitive activity, as well as in various test trials for boxers of heavyweight categories is lower than for lighter athletes [3,4,6].

However, Geroyan G.O. found the opposite picture. In the researchers conducted using a force dynamometer, it was found that the frequency of strikes in boxers in the 10-second and 3-round tests was higher in heavyweights compared to lightweights and middle weights.

It is represented that in the last research the obtained fact may be explained by some features of the measurement of the frequency of impacts.

The force dynamometer registered only strikes delivered with a certain force.

If the blows were struck with a force lower than established threshold, they were not fixed by the recording device. It is understandable that if the heavyweights have a greater force of strikes, they also inflict a greater number of heavy punches, which are recorded on the dynamometer.

Thus, the ambiguity of the speed-power capabilities of athletes with different weight-height data allows us to recommend to trainers to consider these group characteristics of athletes [4].

In the majority of the works describing relationship of endurance of athletes with weight - height indicators, authors most often use the functional indicators characterizing operability of the cardiovascular and respiratory systems defining manifestation of special endurance.

Many researchers note that the morphological characteristics of athletes have a significant impact on the manifestation of performance in exercises of both regional and global nature.

Besides, it is established that when performing exercises of a global nature, people with significant weight-height data have rather smaller working capacity.

The reason for this is the lower level of development of their aerobic and anaerobic abilities.

In many researches there has been a diminished working capacity of boxers with a significant body weight [7].

It is also shown that the greater the athlete's own weight, the lower the performance of its cardiovascular system, determined by the PWC170 breakdown (calculated per I kg of body weight), which is obviously associated with large loads on it.The highest working capacity is noted in the boxers of the lightest and medium weight categories. The relative indicator at investigated persons averaged about 20 kg on the I kg of body weight. Shiryaev A.G. revealed that with an increase in the weight category, the special endurance deteriorates, which is determined at competitions by the number of performed techniques and their effectiveness. Especially accurately it is manifested in the second and third rounds of a fight [6]. Indicators of strength endurance in exercises with 90% of the burdens performed in static and dynamic modes of operation decrease with increasing length and weight of the body.

Results and discussion

We did not manage to find experimental research on the influence of body weight on endurance boxers. There is only some information based on observations, which indicates a lower level of endurance of heavyweight boxers compared to athletes of other weight categories. Nevertheless, there is evidence that indirectly reflects the level of endurance boxers. For example, at a research of results of dependence of the maximum aerobic capacity on weight category of boxers, a significant relationship was found between these values [6].

At the same time, the closeness of communication increases in process of increase in weight. The maximum aerobic performance of boxers of different weight categories are presented in table 1.

Table I

Indicators of maximum oxygen consumption (VO2 max) for boxers of different weight categories

	Weight classes (kg)	VO2 max($\frac{L}{min}$)	$\frac{Vo2\ max}{kg}$ ($\frac{ml}{kg.\ min}$)
1	2	3	4
Flyweight	**to 52**	3,59±0,38	67,61±7,27
Featherweight	**to 57**	3,80±0,18	62,67±3,51
Lighter welterweight	**to 63**	4,15±0,26	63,23±3,64
Welterweight	**to 69**	4,76±0,73	65,10±5,79
Middleweight	**to 75**	4,70±0,15	61,40±2,08
Light heavyweight	**to 81**	4,89±0,77	59,57±5,51
Heavyweight	**to 91**	5,20±0,49	57,13±3,14
Super Heavyweight	**over 91**	5,43±0,69	52,21±6,73

From the presented data it is clear that as the weight of boxers increases, there is a tendency to increase in absolute values of the VO2 max and decrease in its relative level. The VO2 max for the athletes of the lightest weight category in absolute values was 3.59 l / min, and the super heavyweight - 5.43 l / min. In relative values, this indicator was equal to 67.61 ml / min / kg and 52.21 ml / min / kg, respectively.

One of the most important and at the same time most difficult and largely unexplored physical qualities is agility. Only survey works about positive influence of a large supply of conditioned-reflex motive communications and volume of the studied movements on speed of assimilation of new movement skills are known.

These include work on identifying the accuracy of reproduction of spatial signs of movements, muscular- articular memory and feeling, accuracy of orientation in intervals of time, stability in maintaining balance [7].

In the literature need to shed a little light on matters of the relationship of dexterity and morphological indicators. It is established that the muscle memory is different at people to certain anthropological type [3]; that the body weight of athletes practically does not affect the accuracy of differentiation of their own muscular efforts in local (self-power) and global (speed-strength) exercises [2]; that the accuracy of orientation in space, as well as the ability to maintain static and dynamic balance in athletes does not depend on body weight [1].

There are only some data according to which it is possible to judge that body weight has a certain impact on some indicators of dexterity. So, by certain trainers it was noticed that heavyweights are less coordinate and possess less various and effective equipment in comparison with boxers of light and middle weight categories [5]. Besides, it was shown that at light heavyweights and heavyweights the smaller number and a variety of shock and protective actions in fight is observed [3].

It should also be noted that Butenko B.I. (2007) revealed a tendency to a certain deterioration in the ability to reproduce certain magnitudes of the force and speed of strikes in boxers of light heavy and heavyweight categories.

Conclusions

Analysis and synthesis of literature on the subject under study allows us to conclude that, along with very valuable facts regarding the identification of significant differences in the level of physical and functional fitness among athletes of different weight categories, the whole training method for boxers in heavyweight categories is still far from being resolved.

We did not succeed in finding special works on the experimental researches of the training methods for heavyweight categories of boxers in the available literature. There are only researches showing the existence of heavyweight categories of boxers in the manifestation of certain physical qualities and functional fitness, as well as in the level of technical and tactical skill. At the same time, the physical qualities and especially the technical and tactical skills of athletes are studied very incompletely. The features of the manifestation of general physical qualities were almost not investigated at all, and technical and tactical skills were studied on a small number of indicators, reflecting mainly the number of techniques performed, and not their quality.

Even less studied the features of training boxer's heavyweight categories. With the exception of recommendations based only on practical experience and too general in nature, no other information on the use of training tools and methods, the dosage of loads, the construction and planning of training boxers of this weight group could not be found. At the same time, there are convincing facts in the literature testifying to the expediency of using the training method based on the principle of group individualization of training boxers of heavyweight categories. However, for the development of this approach, the available information in the literature is far from sufficient.

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