

CONNECTION OF BOXERS' COMBAT STYLES WITH PSYCHO-PHYSIOLOGICAL CHARACTERISTICS

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Abstract. *Purpose:* By dominating physical characteristics boxers' combat styles are divided into "strongmen", "paced in hold" and "players". However, connection of combat style with psycho-physiological characteristics of elite boxers has been remained not determined. *Material:* in the research 28 elite sportsmen (master of sports and international masters of sports) participated. Psycho-physiological characteristics were studied with the help of hardware and software psycho-diagnostic complex "Multi-psycho-meter 05". *Results:* it was found that attacking combat style is accompanied by presence of high workability, reduced tiredness and anxiety, presence of psychological comfort. It was also found that defensive combat style is characterized by better quickness and processing of information. It happens at the account of worsening of qualitative characteristics: efficiency and effectiveness. We also detected presence of more rigid organization of psycho-physiological status of boxers, having attacking combat style (strongmen) in comparison with boxers of defensive style (players and paced in hold).

Introduction

At modern stage of development of boxing combat style is a characteristic feature of every professional boxer [1, 2]. Up to the present time origin of different combat styles in martial arts has not been determined completely. There is an opinion that styles were formed as a result of separate trainings of separate groups of people [3]. However, great majority of specialists think that combat style depends on boxer's individual characteristics and his inborn features [4, 5, 6].

Modern classification of combat styles in boxing is based on attacking or defensive actions. Basing on it, styles are divided into attacking, counter-attacking and defensive [7, 8, 9]. By dominating physical characteristics boxers' combat styles are divided into "strongmen", "paced in hold" and "players". "Players" are characterized by high coordination or dexterity and by wide technical arsenal [10, 11, 12]. In martial arts combining of different physical features and prevailing of attacking or counter-attacking actions is often observed. For example, for "strongmen" attacking actions can be the most often characteristic. "Players" can demonstrate counter-attacking or defensive actions [13, 14, 15, 16]. Determination of boxer's bent to certain combat style is rather important question, as far as style of actions is the most expressed at the stage of maximal realization of sportsman's potentials. However, for improvement of boxers' training effectiveness their bents to certain combat styles shall be determined at all stages of training [17, 18, 19, 20].

Considering the above said we can assume that physiological basis of styles' formation is relatively unchangeable genetically determined psycho-physiological functions: for example, neuro-dynamic processes and cognitive characteristics. That is why assessment of such indicators of boxer's bent to certain combat style in training process will be useful for the stage of specialized basic training.

Methods, tasks of the work, material and methods

The purpose of the work is to analyze connection of combat style with different psycho-physiological characteristics of elite boxers.

Materials and methods of the research: in the research 28 elite sportsmen (master of sports and international masters of sports) participated. The researches were conducted on the base of NUPESU, department of biology of sports and department of sport martial arts and power kinds of sports. Examinations were carried out with the help of hardware and software psycho-diagnostic complex "Multi-psycho-meter 05".

Psycho-physiological status was studied with 8 colors' variant of Luscher's test in modification of L/ Sobchuk (method of pairwise comparison). We determined indicators of workability, tiredness, anxiety, excentricity, concentricity, vegetative coefficient, heteronomosity, autonomy.

Cognitive function (as component of psycho-physiological status: attention, perceiving and thinking) were detected by test "determination of regularities". We assessed quickness and accuracy of word's recognition. The word was coded by symbols' sequence among 25-points' varianta with 5-alternatives' choice. Function of perception was detected with test "perceptive quickness". We determined indicators of efficiency and quickness of visual perception. Quickness of responses was assessed by determination of latent period of simple visual-motor response. For studying of connections between the researched indicators we used correlation analysis.

Results of the research

With the help of cluster analysis sportsmen were divided into groups. We conducted analysis of combat styles' peculiarities of every group's boxers basing on experts' assessment of technical tactic actions. As a result we marked out three main groups of boxers by their combat styles: counter-attacking (player), attacking (strongman) and defensive-counterattacking (paced in hold).

Table 1

Psycho-physiological indicators by digital test of Luscher of boxers with different combat styles (n=28)

Groups of boxers	Indicators				
	Workability, conv.un.	Tiredness, conv.un.	Anxiety, conv.un.	Deviation from autogenic norm, conv.un.	Vegetative coefficient, conv.un.
Players	9.91±0.4	3.09±0.43	1.91±0.25	18.04±0.75	17.09±0.39
Strongmen	10.43±0.42	1.14±0.16*	1.14±0.4*	12.57±0.84*	12.57±0.98*
Paced in hold	9.25±0.21	2.50±0.65	2.00±0.32**	16.50±0.43**	16.25±1.27**

Notes: 1. * p< - comparing with players' group; 2. * p< - comparing with strongmen's group.

The conducted Luscher's tests showed difference between groups of boxers (players, paced in hold and strongmen) by indicators of workability, anxiety and fatigue (see table 1).

"Attackers" – strongmen are characterized by higher workability, low tiredness, reduced anxiety, moderate deviation from autogenic norm (psychological comfort), low sympathetic tone, increased heteronomosity (see table 1).

In their turn "counter-attacking" – players and paced in hold are characterized by relatively not high workability, high tiredness and anxiety, high deviation from autogenic norm (psychological discomfort), high sympathetic tone, low heteronomosity (see table 1).

Table 2

Indicators of latent period of visual-motor response of boxers with different combat styles (n=28)

Groups of boxers	Indicators	
	Latent period, m.sec.	Stability, %
Players	262.99±0.11	17.73±0.49
Strongmen	279.33±0.85*	19.97±0.17*
Paced in hold	265.62±0.52	18.24±0.25

Notes: 1. * p< - comparing with players' group.

Analogous results were received with studying of latent period of complex visual motor response. Boxers of attacking style (strongmen) have higher time indicators of response, comparing with other combat styles (see table 2).

Table 3

Indicators of boxers with different combat styles by test "quickness of perception" (n=28)

Groups of boxers	Indicators	
	Efficiency, conv.un.	Quickness, conv.un.
Players	62.55±0.55	16.75±0.45
Strongmen	58.57±0.62*	15.85±0.42
Paced in hold	46.50±0.95***	14.31±0.61*

Notes: 1. * p< - comparing with players' group; 2. * p< - comparing with strongmen's group.

Research of perception quickness showed presence of high indicators of efficiency and quickness of visual information's perception, belonging to players and boxers with counter-attacking combat style (see table 3). Analysis of thinking and information processing functions of boxers with different combat styles resulted in determination of difference in effectiveness and stability of information's processing (see table 4). It was found that effectiveness and stability of information's processing if the highest in boxers-strongmen (see table 4).

Table 4

Indicators by test "comparison of numbers" of boxers with different combat styles (n=28)

Groups of boxers	Indicators			
	Effectiveness, conv.un.	Latent period, m.sec.	Accuracy, m.	Stability, %
Players	1006.36±17.84	963.89±26.14	0.96±0.01	23.28±0.24
Strongmen	1241.88±11.22*	1177.56±41.57*	0.95±0.01	31.7±0.28*
Paced in hold	1006.44±13.35**	953.10±35.05**	0.95±0.01	28.26±0.25**

Notes: 1. * p< - comparing with players' group; 2. * p< - comparing with strongmen's group.

The fulfilled analysis between indicators of Luscher's test and psycho-physiological indicators (received in other tests) showed the following: boxers with defensive combat style demonstrated less quantity of confident correlations (only 5) than attacking boxers (in total 29 confident correlation). This circumstance points at more rigid organization of psycho-physiological state of attacking-style boxers.

Discussion

At modern stage of boxing development combat style is characteristic feature of every professional boxer. Among known boxers there are sportsmen, who are characterized by strong aggressiveness in duel. They have powerful blow, strive for power suppression of opponent. They are attacking "strongmen". Some boxers constantly vary their actions. They use a lot of "feints", strikes in the most unexpected moments. They are counter-attacking "players". There are boxers, who "exhaust" opponent with high pace of many rounds. They win, when opponent is not able to keep the imposed pace. They are counter attacking "pace in hold".

Nevertheless, the most characteristic features of boxers' motor actions are unchangeable that permits to speak about dominating style. It is known that sportsman's individual typological characteristics (genetically determined) are reflected just in psycho-physiological characteristics of perception and processing of information [6, 9, 20].

In process of researching of combat style's connection with psycho-physiological characteristics of elite boxers we detected that attacking style (of strongmen) is accompanied by high workability, reduced tiredness and anxiety, presence of psychological comfort. At the same time defensive and counter-attacking combat styles (intrinsic to players and paced in hold) are characterized by better indicators of quickness and processing of information. It is achieved at the account of worsening of qualitative characteristics: efficiency and effectiveness.

Study of psycho-physiological functions' organization of boxers with different combat styles resulted in the fact that attacking style is characterized by more rigid organization of psycho-physiological status. It points at individual-typological distinctions by psycho-physiological characteristics of boxers with different combat styles.

Conclusions

1. Attacking combat style of strongmen is characterized by high workability, reduced tiredness and anxiety, presence of psychological comfort.

2. Defensive combat style of players and paced in hold is characterized by better indicators of quickness and processing of information at the account of worsening of qualitative characteristics: efficiency and effectiveness.

3. It was found that attacking boxers (strongmen) have more rigid organization of psycho-physiological state in comparison with boxers of defensive style (players and paced in hold).

Conflict of interests

The authors declare that there is no conflict of interests.

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