Model characteristics of sensorimotor reactions and specific perceptions of trained wrestlers

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Purpose: *to develop the model characteristics of sensorimotor reactions and specific perceptions of trained wrestlers.*

Material & Methods: *analysis of scientific and methodological information, generalization of best practical experience, psychophysiological methods of research, methods of mathematical statistics. The study involved 26 trained wrestlers engaged in different kinds of wrestling (freestyle, Greco-Roman), aged 17 to 24 years old.*

Results: *an assessment of simple, complex motor reactions and specific perceptions of wrestlers was performed. Based on the results obtained, the model characteristics of sensorimotor responses and specific perceptions of trained wrestlers.*

Conclusion: *this analysis and the models presented were the basis for the development of evaluation criteria specific sensorimotor reactions and perceptions of the trained wrestlers.*

Keywords: *model characteristics, sensorimotor reactions, specific perceptions, trained wrestlers.*

Introduction

Ability to conduct a large number of complex technical and tactical actions, taking into account possible actions of an opponent in a duel, making bold and instant decisions in extreme situations against the impact of confounding factors – all this is a prerequisite for success in the competitive activity of fighters and reflects the level of their psychological preparedness [3; 6; 7; 9; 21].

Psychophysiological functions of a person depend on the characteristics of the higher nervous system that characterize the process of formation and improvement of special motor skills in conditions of sports activity [11; 18; 19].

Objective criteria for the current functional state of the central nervous system are the parameters of sensorimotor reactions of varying degrees of complexity [1].

Time of sensorimotor reactions is one of the simplest, accessible and at the same time fairly accurate neurophysiological indicators that reflect the dynamics of the speed of nervous processes and their switching, motor coordination, overall performance and activity of the central nervous system during various periods of sports training [14; 17].

Training and competitive activities in martial arts contribute to the formation of a complex of specific reactions and perceptions among athletes. They are based on the threshold of perception of stimuli entering various sensory systems. The main role in this is played by the levels of muscular-motor, visual, vestibular and auditory sensations. Higher the level of athletic skill athlete, the higher the level of the value of psychophysiological functions to achieve a competitive result [8; 10; 13; 22].

The purpose of the research: to develop the model characteristics of sensorimotor reactions and specific perceptions of trained wrestlers.

Objectives of the study:

– to reveal psychophysiological features of wrestlers on the basis of the analysis of the methodical literature and generalization of the best practical experience;

– to develop the model characteristics of sensorimotor reactions and specific perceptions of trained wrestlers.

Material and Methods of the research

26 qualified sportsmen engaged in various types of wrestling (freestyle, Greco-Roman), aged from 17 to 24, took part in the research. Evaluation of sensorimotor reactions and perceptions of specific tests conducted with the help of the complex, designed for tablet PCs [1; 19]. Tests were divided into three groups: assessment of simple sensorimotor reactions; assessment of complex sensorimotor reactions; assessment of specific perceptions.

Research methods: analysis of scientific and methodological information, generalization of best practical experience, psychophysiological methods of research, methods of mathematical statistics.

Results of the research and their discussion

The analysis of methodical literature and the generalization of best practical experience made it possible to establish that the specificity of the competitive activity of martial artists influences the level of development of sensorimotor reactions and specific perceptions that ensure a high sports result [19; 20; 21].

Based on the test results obtained, the model characteristics of sensorimotor responses and specific perceptions of quali-

fied wrestlers were developed (Table 1).

Analysis and models presented were the basis for the development of evaluation criteria for sensorimotor responses and specific perceptions of qualified wrestlers (Table 2). They allow differentiating the evaluation and management of the training process in sports wrestling.

It is established that the planning of training loads must be carried out taking into account the modern requirements of competitive activity, which is associated with raising the level of special working capacity of athletes, improving their technical and tactical actions. This is also confirmed by the results of research presented in scientific papers (A. A. Novikov, 2012; B. V. Dagbaev, 2013; S. Latyshev, G. Korobeynikov, L. Korobeynikova, 2014).

Supplemented data (Z. L. Kozina, I. M. Demura, 2010, V. V. Shatskikh, 2012, V. Miarka, 2016) on the problems of psychophysiological control in martial arts.

Conclusions

1. Analysis of methodical literature and generalization of best practical experience made it possible to establish that the specifics of competitive activity of an athlete leaves its imprint on the level of development of leading sensorimotor reactions that ensure high sports achievements.

2. In the course of the study, the following indicators were obtained: the level of simple sensorimotor reactions (tests: "Simple motor skills and resistance to confounding factor", "Simple visual-motor reaction", "Simple visual-motor reaction"), level of complex sensorimotor reactions (tests: "Selection reaction from static objects", "Reaction discrimination", "Reaction to a moving object", "Reaction selection on dynamic objects"), level of specific perceptions (tests: "Evaluation of the sense of tempo", "Evaluation of reproduction accuracy of a given line", "Evaluation of the perception of the change in the size of the object").

3. Developed model characteristics of sensorimotor reactions and specific perceptions of trained wrestlers who may eventually become the basis for the creation of rapid diagnostics readiness of wrestlers for competitions.

Further research will be aimed at determining the relationship between psycho-physiological indicators and the special physical preparedness of wrestlers.

Table 1

Model parameters of sensorimotor reactions and specific perceptions of trained wrestlers (n=26)

No.	Indicators of sensorimotor reactions and specific perceptions	$\bar{X}$	δ	m
	Simple reactions			
1.	Simple motor skills (number of clicks per 10 s)	25,37	1,54	0,30
2.	Resistance to confounding factor (%)	80,48	5,82	1,14
3.	A simple visual-motor reaction (ms)	230,48	15,81	3,10
4.	A simple visual-motor reaction (ms)	212,22	14,69	2,88
	Complex reactions			
5.	Selection reaction from static objects (ms)	637,24	68,19	13,37
6.	Reaction to a moving object (ms)	19,75	7,02	1,38
7.	Reaction discrimination (ms)	282,79	18,36	3,60
8.	Reaction selection on dynamic objects (ms)	366,43	38,05	7,46
	Specific perceptions			
9.	Evaluation of the sense of tempo (80 beats min^{-1}) (ms)	37,35	13,80	2,71
10.	Evaluation of reproduction accuracy of a given line (mm)	0,45	0,12	0,02
11.	Playback speed of the preset line (mm s^{-1})	97,05	43,43	8,52
12.	Evaluation of the perception of the change in the size of the object (s)	0,89	0,15	0,03

Table 2

Evaluation criteria of sensorimotor reactions and specific perceptions of trained wrestlers

No.	Indicators of sensorimotor reactions and specific perceptions	High level	Medium level	Low level
	Simple reactions			
1.	Simple motor skills (number of clicks per 10 s)	>26,91	26,91–23,83	<23,83
2.	Resistance to confounding factor (%)	>86,30	86,30–74,66	<74,66
3.	Simple visual-motor reaction (ms)	<214,67	214,67–246,29	>246,29
4.	Simple visual-motor reaction (ms)	<197,53	197,53–226,91	>226,91
	Complex reactions			
5.	Selection reaction from static objects (ms)	<569,05	569,05–705,43	>705,43
6.	Reaction to a moving object (ms)	<12,73	12,73–26,77	>26,77
7.	Reaction discrimination (ms)	<264,43	264,43–301,15	>301,15
8.	Reaction selection on dynamic objects (ms)	<328,38	328,38–404,48	>404,48
	Specific perceptions			
9.	Evaluation of the sense of tempo (80 beats min^{-1}) (ms)	<23,55	23,55–51,15	>51,15
10.	Evaluation of reproduction accuracy of a given line (mm)	<0,33	0,33–0,57	>0,57
11.	Playback speed of the preset line (mm s^{-1})	>140,48	140,48–53,62	53,62
12.	Evaluation of the perception of the change in the size of the object (s)	<0,74	0,74–1,04	>1,04

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