Features of psycho-physiological indicators in various types of wrestling

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Purpose: *establish the characteristics of the manifestation of psycho-physiological reactions in various types of wrestling.*

Material & Methods: *analysis of scientific and methodological information, generalization of advanced practical experience, psycho-physiological research methods, methods of mathematical statistics. The study involved 30 qualified athletes involved in various types of wrestling, aged 19 to 22 years. Participants were divided into 2 groups of 15 people: 1 – Greco-Roman and freestyle wrestling; 2 – judo and sambo. Athletes were qualified as master of sports and candidate of master of sports.*

Results: *simple, complex motor reactions and specific perceptions of wrestlers were evaluated. In the course of the study, it was determined that the best indicators of simple reactions are observed in representatives of judo and sambo (from 1% to 4%), while in Greco-Roman and freestyle wrestlers, results in complex reactions (from 1% to 13%) and specific perceptions (from 5% to 14%).*

Conclusions: *it was established that different types of wrestling form the ability to quickly analyze, evaluate and predict situations and make the right decisions in a timely manner during the fight, which explains the unreliable differences (p>0,05) in the psycho-physiological indicators of the athletes studied.*

Keywords: *judo and sambo, Greco-Roman and freestyle wrestling, sensorimotor reactions, specific perceptions.*

Introduction

Diagnostics of the functional states of the athlete's body is one of the current trends in modern sports science. High sports achievements are closely connected with the psycho-physiological functions of a person. It is known that full commitment to training activities and competitive results achieved by an athlete are largely due to the level of development of psychosensory abilities [2; 10; 15; 21].

A number of authors [6; 9; 16; 19] consider that the psychophysiological functions of a person constitute the biological foundation of individually-typological features of the higher nervous system, they characterize the process of formation and improvement of special motor skills in the conditions of training and competitive activity. The functional state of psycho-physiological functions can be an indicator of both the level of fitness of an athlete and the development of fatigue and overstrain processes in him.

The basic properties of the nervous system determine the functional and psychological preparedness of athletes responsible for athletic performance, especially in situational sports (various types of wrestling) [11; 14; 20; 22].

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 background of impacting factors – all this is a necessary condition for achieving success in competitive activities of martial artists and reflects their level of psychological preparedness [4; 7; 15; 18].

Training and competitive activity in the wrestling contributes to the formation of the whole complex of athletes specific reactions and perceptions. They are based on the threshold of perception of stimuli entering various sensory systems. The main role is played by the levels of musculoskeletal, visual, vestibular and auditory sensations. The higher the level of sportsmanship of an athlete, the higher the level of importance of psycho-physiological functions for achieving competitive results [3; 5; 12; 17].

Purpose of the study: establish the characteristics of the manifestation of psycho-physiological reactions in various types of wrestling.

Objectives of the study:

– based on the analysis of the methodological literature and generalization of the best practical experience to identify the psycho-physiological characteristics of the wrestlers;

– determine the indicators of psycho-physiological reactions in wrestlers of various types;

– to conduct a comparative analysis of the indices of psycho-physiological reactions in wrestlers of various types.

Material and Methods of the research

To solve the research problems, the following methods were used: analysis of scientific and methodological information, generalization of advanced practical experience, psychophysiological research methods, methods of mathematical statistics.

The study involved 30 athletes involved in various types of wrestling. Participants were divided into two groups: 1 – 15 representatives of Greco-Roman and free-style wrestling, av-

erage age (20,53±1,71) years; 2 – 15 people involved in judo and sambo, the average age (20,85±1,35) years, no significant differences in age (p>0,05). Athletes were qualified as Master of Sports and Candidate Master of Sports.

Based on the analysis of methodological literature and generalization of advanced practical experience, it was found that the specifics of the competitive activities of wrestlers affect the level of development of psycho-physiological reactions that provide high athletic performance [8; 13; 16; 22].

Evaluation of psychophysiological reactions was carried out using a set of tests developed for tablet personal computers [1]. The tests were divided into three groups: evaluation of simple sensorimotor reactions; evaluation of complex sensorimotor reactions; evaluation of specific perceptions.

To determine the homogeneity of sample observations, the coefficient of variation was used.

Results of the research

The obtained data testify to the homogeneity of indicators of simple and complex reactions of the athletes under study, both in the first (coefficient of variation ranges from 3,89% to 10,61%) and in the second group (from 4,41% to 11,02%), except for the indicator of a complex reaction to a moving object, which has a high coefficient of variation in the first (26,04%) and in the second group (24,53%).

The indicators in tests that reflect the specific perceptions of wrestlers also have a high coefficient of variation in the first (from 11,42% to 34,74%) and in the second group (from 11,79% to 43,09%), this is explained by the qualifications of the athletes , which individually displays a prediction of the situation (anticipation) (Table 1).

Table 2 presents the test results for specific sensorimotor responses and the perceptions of wrestlers of various types.

Comparing the indicators of sensorimotor reactions and specific perceptions of the subjects, it was found that the results of simple reactions are higher among the representatives of

the second group (judo and sambo) in the tests: simple motility at 4%, resistance to confounding factors at 2%, simple visual-motor reaction at 1%, simple auditory-motor reaction at 1%; and complex reactions and specific perceptions are better for athletes of the first group (Greco-Roman and free-style wrestling): selection reaction from static objects by 1%, response to a moving object by 13%, discrimination response by 4%, selection reaction from dynamic objects by 1%, assessment of the sense of tempo by 14%, reproduction assessment of the accuracy of a given line by 5%, playback speed of a given line by 9%, assessment of the perception of a change in the object size by 7%.

The results of the study are explained by the specificity of competitive and training activities, Greco-Roman and free-style wrestlers carry out attacking actions, mainly from long and medium distance, and representatives of judo and sambo - from near, and they often struggle to disrupt the opponent's capture.

Conclusions / Discussion

Based on the analysis of methodological literature and generalization of advanced practical experience, it was found that the specifics of the competitive activities of wrestlers affect the level of development of psycho-physiological reactions, providing a high sports result.

During the study, the following indicators were obtained: the level of simple sensorimotor reactions (tests: "Simple motility and resistance to confounding factors", "Simple visual-motor reaction", "Simple auditory-motor reaction"), the level of complex sensorimotor reactions (tests: "Reaction of choice from static objects", "Reaction of discrimination", "Reaction to a moving object", "Reaction of selection from dynamic objects"), the level of specific perceptions (tests: "Evaluation of a sense of tempo", "Evaluation accuracy and speed when playing a given line", "Evaluation of the perception of a change in the size of an object").

In the course of the study, it was determined that the best indicators of simple reactions are observed in representatives of judo and sambo (from 1% to 4%), while in Greco-Roman and

Table 1

Coefficient of variation of indicators of psycho-physiological reactions of wrestlers (n=30)

No.	Indicators	1 group (n=15)	2 group (n=15)
	Simple reactions		
1.	Simple motility (the number of clicks for 10 s)	5,37	5,28
2.	Resistance to confounding factors (%)	3,89	4,41
3.	Simple visual-motor reaction (ms)	6,58	6,01
4.	Simple auditory-motor reaction (ms)	7,42	4,65
	Complex reactions		
5.	Reaction of selection from static objects (ms)	10,21	11,02
6.	Reaction to a moving object (ms)	26,04	24,53
7.	Reaction distinction (ms)	5,32	7,79
8.	Reaction selection of dynamic objects (ms)	10,61	7,09
	Specific perceptions		
9.	Estimate of tempo feeling (80 beats·min^{-1}) (ms)	34,74	43,09
10.	Evaluation of the reproduction of the accuracy of a given line (mm)	17,07	18,61
11.	Playback speed of a given line (mm·s^{-1})	11,42	37,59
12.	Evaluation of the perception of a change in the size of the object (s)	11,77	11,79

Remark. *1 group – freestyle and Greco-Roman wrestling; 2 group – judo and sambo.*

Table 2

Indicators of psycho-physiological reactions of the wrestlers of the first (freestyle and Greco-Roman wrestling) and second (judo and sambo) groups (n=30)

No.	Indicators	1 group (n=15)	2 group (n=15)	Confidence level	
				t	p
	Simple reactions				
1.	Simple motility (the number of clicks for 10 s)	25,31±0,36	26,33±0,37	−1,96	p>0,05
2.	Resistance to confounding factors (%)	77,85±0,81	78,93±0,93	−0,88	p>0,05
3.	Simple visual-motor reaction (ms)	231,50±4,04	229,67±3,69	0,33	p>0,05
4.	Simple auditory-motor reaction (ms)	212,70±4,22	210,25±2,61	0,49	p>0,05
	Complex reactions				
5.	Reaction of selection from static objects (ms)	646,58±17,64	648,49±22,56	−0,07	p>0,05
6.	Reaction to a moving object (ms)	19,05±1,33	21,57±1,14	−1,30	p>0,05
7.	Reaction distinction (ms)	284,05±4,04	294,97±6,14	−1,49	p>0,05
8.	Reaction selection of dynamic objects (ms)	366,82±12,36	369,37±6,99	−0,18	p>0,05
	Specific perceptions				
9.	Evaluation of tempo feeling (80 beats · min^{-1}) (ms)	37,10±3,44	42,14±4,85	−0,85	p>0,05
10.	Evaluation of the reproduction of the accuracy of a given line (mm)	0,41±0,02	0,43±0,02	−0,54	p>0,05
11.	Playback speed of a given line (mm · s^{-1})	70,50±2,15	64,30±6,46	0,91	p>0,05
12.	Evaluation of the perception of a change in the size of the object (s)	0,85±0,03	0,91±0,02	−1,97	p>0,05

Remark. *Confidence t=2,05; p<0,05.*

freestyle wrestlers, results in complex reactions (from 1% to 13%) and specific perceptions (from 5% to 14%).

It has been established that various types of wrestling form the ability to quickly analyze, evaluate and predict situations and make the right decisions in a timely manner during the fight, which explains the unreliable differences (p>0,05) in the psycho-physiological indicators of the athletes under study.

The findings suggest the importance of the psycho-physiological state of athletes as a factor determining success in various types of wrestling. This is also confirmed by the results of research presented in scientific works (V. V. Shatskikh, 2012; G. Korobeynikov and et. al., 2013; S. Latyshev, and et. al., 2014).

The use of modern statistical methods in the analysis of psycho-physiological indicators allows us to build models. They allow you to more clearly represent the changes occurring in the body of athletes. A. S. Rovnyi, V. V. Romanenko (2016) investigated the model characteristics of sensorimotor reactions and specific perceptions of taekwondo of highly qualified athletes, as a result of which the rating scales were developed.

H. Zi-Hong, (2013) determined the physiological profile of elite Chinese women wrestlers. The author recommends that the data be compared with other wrestlers to help identify individual weaknesses or strengths and develop training programs that will allow you to succeed in the fight.

S. Iermakov et. al. (2016) on the basis of model characteristics identified psycho-physiological qualities that are most significant for predicting success in martial arts.

The previously obtained data (R. V. Pervachuk, et al., 2017; Yu. N. Tropin, N. V. Boychenko, 2018; V. Miarka, 2016) on the issues of psycho-physiological control in martial arts were supplemented.

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

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