

## MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL



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#### ANALYSING THE TECHNICAL CHARACTERISTICS OF SWIMMING AT THE SWIMMING TEAM OF THE REPUBLIC OF UZBEKISTAN DURING THE HYDRODYNAMIC RESEARCH

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#### ABOUT ARTICLE

**Key words:** analysis, training, swimmers, national team of the Republic of Uzbekistan, bioimpedance analysis, measurement of hydrodynamics indicators, individualization, body balance, speed of swimming, competitive periods.

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**Abstract:** The main purpose of this research is to analyze the effectiveness of training swimmers of the national team of Uzbekistan based on the individualization of the process through bioimpedance analysis and hydrodynamic research, to monitor the physical and functional state of swimmers, bioimpedance analysis and measurement of hydrodynamic indicators have been systematically carried out, which include streamlining and buoyancy, body balance in water, and they've been largely determined by the characteristics of the physique.

As a result of processing the obtained data, the interrelation of the indicators of the componental composition of the body with the speed of swimming in swimmers at the competitive periods was revealed.

As a result of the analysis of the correlation relationships of the studied indicators of the componental composition of the body with the speed of swimming at a distance, it was revealed that on male and female swimmers, the speed of swimming at a distance depends mainly on the muscle mass of the hands.

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#### INTRODUCTION

The practice of training highly qualified swimmers has moved into the sphere of reproduction of special scientific knowledge and pedagogical technologies, the use of advanced training methods for swimmers at various stages of training in recent decades. For the effective training of the athletes

of the national team, it is necessary to introduce new ideas, methods of sports training, information and resource support for training and control over the condition of athletes [3, 8, 14].

Sports of the highest achievements is characterized by a significant increase in training and competitive loads, which significantly increased the requirements for the functional capabilities of the body of athletes. Thus, at the present stage, to achieve high results, it is not enough only to maximize the development of physical qualities or components of technical readiness. Further improvement of sports performance is possible only due to the development of the maximum functional working capacity of the body. This approach will help to consider the content of the training of swimmers from a different perspective, to increase the level of development of physical qualities, to improve the technique of swimming [1, 9, 11, 15].

The problem of assessing the process of preparing swimmers for responsible starts has become relevant for specialists in the field of sports swimming for a long time [2, 10, 13].

Summarizing the experience of leading experts in the field of sports swimming - Kounsilman D., Trope D. (USA), Carlisle F. (Australia), Davydov V.Yu. (Russia), Platonov V.N. (Ukraine), etc. allows us to conclude that at the present stage, for a qualitative analysis and control of the preparation of the swimmers of the national team for important starts, it is necessary to systematically monitor the indicators of their physical and functional state [4, 12].

The aim of the research is to analyze the effectiveness of training swimmers of the national team of Uzbekistan based on the individualization of the process through a hydrodynamic study [5, 6, 7].

## **MATERIALS AND METHODS**

Monitoring the physical and functional state of the swimmers of the national team of the Republic of Uzbekistan, bioimpedance analysis and measurement of hydrodynamics indicators were systematically carried out.

Bioimpedance analysis in sports is considered as one of the factors that determine the effectiveness of sports activity. The analysis was carried out at the Research Institute of Nutrition of the Russian Academy of Medical Sciences by the department of clinical and instrumental research methods.

A distinctive feature of the bioimpedance analysis method is the possibility of operational examination of athletes in the dynamics of the training cycle by the staff of the medical staff of sports clubs and schools. This allows us to judge the level of physical fitness of athletes at all stages of the training cycle in the monitoring mode.

The main objectives of the application of bioimpedance analysis in sports and sports medicine are:

-evaluation of the optimal values of body composition parameters for specific sports, sports specializations and depending on the skill level of the athlete;

-monitoring the state of fitness of athletes at the stages of the training cycle and in preparation for the competition;

- identification of features and control of the effectiveness of recovery processes in the athlete's body after training loads and in the competitive period;

-monitoring of bioimpedance parameters of individual muscle groups during power loads;

- prevention of disorders associated with inadequate choice of diet and training loads.

The swimmer's hydrodynamic qualities which include streamlining and buoyancy, body balance in water, are largely determined by the characteristics of the physique.

The measurement of swimmers' hydrodynamics indicators was carried out on the basis of the following tests:

1-time of swimming the measured segment of 30 meters without resistance;

2-time of swimming a measured segment of 30 meters with resistance;

3-maximum swimming speed on a measured segment of 30 meters;

4-active resistance;

5-vehicle factor;

6-total external mechanical power. Under the conditions of human cyclic locomotion, metabolic energy is converted into mechanical energy, which in turn is transformed into a useful result of activity (speed).

## **RESULT AND DISCUSSION**

For the direct training of athletes of the national swimming team of the Republic of Uzbekistan, the training center of the All-Russian Swimming Federation (swimming complex "Iskra", Volgograd) was chosen. Eleven athletes of the national team have been preparing for important starts.

The choice of this particular base for preparing the athletes of the national team for important starts is not accidental, because at the base at different times three-time Olympic champion Evgeny Sadovy, two-time Olympic champion Denis Pankratov Larisa Ilchenko, Olympic medalists Roman Ivanovsky, Evgeny Seredin, world champion Andrei Gladkov and others. Also, the center is equipped with the latest equipment and various instrumental techniques that allow you to monitor the condition of athletes and make adjustments to the methodology of their training.

During the preparation of the athletes of the national team for important starts, observations were made of their morphological and functional changes. Also, measurements were taken of the body composition of the athletes of the national team.

*Table 1.*

*Assessment of swimming technique during hydrodynamic research.*

No	Full name of the athlete	Date of birth	M	Investigated year	t30M Fr, c <sup>1</sup>	t30M R, c <sup>2</sup>	Vmax, m/c <sup>3</sup>	Active resistance H <sup>4</sup>	CX, c.u. <sup>5</sup>	Pto, W <sup>6</sup>
1	Kritinina N	2001	f/s	2017	18,76	21,36	1,59	46,7	0,229	74,6
			f/s	2018	18,12	20,76	1,65	46,2	0,213	76,4
			f/s	2019	18,15	20,27	1,65	57,9	0,263	95,6
2	Dzhumabayeva M	2002	br	2017	20,20	22,78	1,48	46,5	0,303	69,0
			br	2018	21,12	22,84	1,42	69,9	0,500	99,3
			br	2019	20,42	21,93	1,46	80,3	0,496	117,9
3	Abdujalilov H	2002	f/s	2019	16,56	17,72	1,81	108,3	0,383	196,1
			f/s	2019	16,98	18,19	1,76	103,4	0,378	182,7
			f/s	2019	17,46	18,95	1,71	83,4	0,323	143,3
4	Yusupbaev A	2002	b/st	2017	18,66	20,88	1,60	55,0	0,243	88,4
			b/st	2018	18,58	20,59	1,61	60,9	0,266	98,3
			b/st	2019	16,82	17,67	1,78	147,9	0,508	263,8
5	Erembetov R	2002	br	2019	23,40	25,12	1,28	68,5	0,515	87,8

	M				Vmax, m/s <sup>3</sup>	Active resistance H <sup>4</sup>	CX, c.u. <sup>5</sup>	Pto, W <sup>6</sup>
NORMS for elite athletes (F)	b/st				1,45±0,010	48,96±1,73	0,298±0,010	71,15±2,77
	f/t				1,69±0,007	60,95±3,81	0,264±0,011	102,95±4,76
	bt				1,54±0,008	54,31±2,04	0,286±0,012	82,41±3,54
	br				1,33±0,005	58,33±2,63	0,422±0,19	77,62±3,53
NORMS for elite athletes (M)	b/st				1,67±0,006	88,55±5,03	0,343±0,017	147,47±8,50
	f/st				1,98±0,006	111,0±4,64	0,303±0,014	219,27±9,20
	bt				1,77±0,006	105,89±4,62	0,365±0,015	183,77±7,53
	br				1,45±0,005	94,63±5,17	0,479±0,022	138,56±8,04

**Notes:**

1-time of swimming the measured segment of 30 meters without resistance, s;

2-time of swimming a measured segment of 30 meters with resistance, s;

3-maximum swimming speed on a measured segment of 30 meters, m / s;

4-active resistance, N;

5-vehicle coefficient, conventional units;

6-total external mechanical power, W.

Table 2.

**Assessing of body composition of team athletes at the launching of the research**

№	Athlete's full name	Weight (kg)	Body mass index	Lean mass (kg)	Fat mass (kg)	Muscle mass (kg)	Total fluid (kg)	Active cell mass (kg)
1	Djumaeva M.	51,9	18,6	37,9	14,0	19,3	27,7	21,8
2	Abdijalilov M	72,1	21,1	61,5	10,6	34,2	45,0	37,3
3	Mirzoidov M.	67,0	22,9	58,8	8,2	32,9	43,0	37,1
4	Yusupbaev A.	73,0	20,7	59,9	13,1	34,0	43,8	34,9
5	Erembetov R.	65,0	18,2	53,9	11,1	31,4	39,4	31,7
6	Abdujalilov Kh.	67,5	19,7	54,1	13,4	31,2	39,6	32,7

Table 3.

*Assessing of the body composition of athletes of the national team by the end of the research*

№	Athlete's full name	Weight (kg)	Body mass index	Lean mass (kg)	Fat mass (kg)	Muscle mass (kg)	Total fluid (kg)	Active cell mass (kg)
1	Djumaeva M.	56,3	19,9	40,3	16,0	20,1	29,5	24,9
2	Abdijalilov M	76,2	21,8	64,6	11,6	35,9	47,3	41,0
3	Mirzoidov M.	71,5	23,9	58,6	12,9	32,1	42,9	38,1
4	Yusupbaev A.	78,1	21,0	64,0	14,1	35,9	46,8	39,3
5	Erembetov R.	66,5	18,6	54,8	11,7	17,6	40,1	33,5
6	Abdudjalilov Kh.	74,7	21,1	60,0	14,7	33,8	43,9	38,5

The identifying the body composition of swimmers, we used bioelectrical impedance analysis using the Tanita body composition analyzer. The body composition analyzer was used to measure the percentage of adipose tissue, as well as to assess the composition of the body of athletes.

As a result of the research, the following data of the swimmers were obtained. Analyzing the body weight and fat mass of the athletes studied by us, based on tables No. 2,3 it can be concluded that the increase in body weight and components has increased. As a result of processing the obtained data, the interconnection of the indicators of the component body composition with the swimming speed was revealed in swimmers in the competitive periods. As a result of the analysis of the correlation relationships of the studied indicators of the component composition of the body with the speed of swimming at a distance, it was revealed that in swimmers and swimmers, the speed of swimming at a distance depends mainly on the muscle mass of the arms. It should be noted that the greater the muscle mass of the arms and legs of the athletes under study, the higher the swimming speed, and also has a strong correlation with body weight, muscle and bone mass.

### CONCLUSION

In the course of our research, the following patterns were identified:

1. at the stage of preserving achievements, the work is purely individual, and preparation at this stage is not limited to displaying training and competitive volumes of work;
2. the structure and content of training swimmers for the Games of the Olympics at the stage of preserving achievements includes, in addition to pedagogical, a number of other criteria that objectively affect the final result of the Olympic cycle;
3. target preparation for the main competitions of the Olympic cycle is based on the following criteria: pedagogical, socio-psychological, biomechanical and medico-biological.
4. the development of training programs should be carried out across the entire range of criteria that objectively affect athletes at the stage of maintaining achievements.

In our opinion, issues related to the search for optimal forms of interaction between various training programs, depending on the criteria that determine the effect, require further consideration. It is necessary to bring training in areas (pedagogical, biomedical, biochemical and psychological)

into a single program, which will save energy on the search for the optimal targeted training of highly qualified swimmers, depending on gender, experience and specialization.

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