A comprehensive assessment of the potential of young swimmers at the preliminary selection stage

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Abstract
This article examines the specifics of a comprehensive assessment of the potential of young swimmers during the preliminary selection stage. It substantiates the need to use a combination of morphofunctional, physical, and sport-specific indicators to improve selection efficiency. The results of a pedagogical experiment are presented, confirming the feasibility of applying a comprehensive approach to assessing athletes' preparedness at the initial specialization stage.
Keywords: competitive swimming, preliminary selection, potential, morphofunctional indicators, physical fitness, young swimmers, assessment methodology.

Introduction

The modern development of competitive swimming requires improving the efficiency of the athlete selection system at all stages of long-term training. The preliminary selection stage, during which the potential of young swimmers and their readiness for further athletic specialization are determined, is of particular importance [1, 4, 5, 8].

Inaccurate assessment at this stage can lead to errors in the distribution of training loads and a decrease in training effectiveness. In this regard, there is a need to develop and implement a comprehensive approach to assessing potential based on a set of morphofunctional, physical, and sport-specific indicators [2, 3, 6, 7].

The objective of the study is to substantiate the effectiveness of a comprehensive assessment of the prospects of young swimmers during the initial selection stage.

Organization and Research Methods. The study was conducted at Sports School No. 2 of the Mirzo-Ulugbek district and the Tashkent City Specialized School for Water Sports from 2024 to 2026. The pedagogical experiment involved 32 young swimmers aged 10–12 who were in the initial specialization stage and had no significant differentiation in their level of fitness.

In accordance with the aims and objectives of the study, the subjects were divided into two groups: a control group (CG) and an experimental group (EG), with 16 participants in each. In the control group, the process of assessing prospects was based on traditional approaches used in children's and youth sports schools. The experimental group utilized a newly developed comprehensive assessment system that included a set of morphofunctional, physical, and sport-specific indicators, providing a more thorough characterization of the athletes' fitness level and potential.

The study was organized in stages. The first stage involved an analysis of scientific and methodological literature and a refinement of the criteria for assessing the potential of young swimmers. In the second stage, initial testing of the subjects was carried out to determine their baseline level of morphofunctional development, physical fitness, and sport-specific conditioning. During the third stage, a pedagogical experiment was conducted in which a comprehensive approach to athlete evaluation and selection was applied to the experimental group. The final stage included re-testing and a comparative analysis of the data obtained.

Results and discussion

A set of complementary methods was used in the research process. Anthropometric measurements included determining height, body weight, limb length, and shoulder girdle width, which allowed for the assessment of morphological predispositions for swimming. The functional state of the body was evaluated using indicators such as vital capacity of the lungs (VC), heart rate (HR) at rest and after exercise, as well as the Ruffier test, which characterizes the performance level of the cardiovascular system.

The level of physical fitness was determined through pedagogical testing, which included an assessment of speed (short-distance running), speed-strength (standing long jump), strength (pull-up bar hang), and flexibility (standing forward bend). Sport-specific fitness

Table 1. .Dynamics of morphofunctional indicators in young swimmers at the preliminary selection stage

Indicator	Group	Before (M±m)	After (M±m)	t	p
Height, cm	CG	138.2±0.9	139.6±1.0	1.08	>0.05
	EG	137.8±0.8	142.1±0.9	3.45	<0.01
Body weight, kg	CG	34.5±0.7	35.3±0.8	0.82	>0.05
	EG	34.1±0.6	36.8±0.7	2.76	<0.05
VC, ml	CG	2100±50	2250±60	1.74	>0.05
	EG	2080±45	2500±65	4.12	<0.01
Ruffier test, conv. units	CG	9.5±0.3	8.9±0.3	1.52	>0.05
	EG	9.4±0.3	7.6±0.2	3.98	<0.01

was evaluated based on the results of time trials over 25 and 50 meters, as well as an expert assessment of swimming stroke technique.

Pedagogical observation was conducted during training sessions and was aimed at identifying the specifics of the trainees' adaptation to training loads, as well as their level of mastery of motor skills in an aquatic environment.

The results of the pedagogical experiment demonstrate the high effectiveness of applying a comprehensive approach to assessing the potential of young swimmers at the preliminary selection stage. It was established that using a combination of morphofunctional, physical, and sport-specific indicators allows for a more accurate differentiation of trainees by fitness level and helps identify athletes with the greatest potential for further development.

The experimental group demonstrated more pronounced positive changes in morphofunctional indicators compared to the control group. Specifically, a significant increase in vital lung capacity and an improvement in cardiovascular system performance were recorded, which indicates an increase in the body's functional reserves and its adaptive capabilities to physical exertion. These results are consistent with the principles of V.N. Platonov, who states that an organism's functional capabilities are a key factor in determining athletic potential in the early stages of training.

An analysis of physical preparedness revealed that subjects in the experimental group showed statistically significant improvements in speed, speed-strength, and coordination abilities ($p<0.05–0.01$), indicating a more effective development of fundamental physical qualities. This corresponds with the concept of L.P. Matveev, which considers physical preparedness a fundamental component of athletic mastery and the basis for further specialization.

Table 2. Dynamics of physical fitness indicators in young swimmers at the preliminary selection stage

Indicator	Group	Before (M±m)	After (M±m)	t	p
30 m run, s	CG	5.9±0.2	5.7±0.2	0.88	>0.05
	EG	6.0±0.2	5.4±0.1	3.02	<0.01
Standing long jump, cm	CG	150±5	158±6	1.21	>0.05
	EG	148±5	168±6	3.44	<0.01
Forward bend, cm	CG	7±0.6	8±0.7	0.95	>0.05
	EG	7±0.5	11±0.7	3.63	<0.01
Flexed-arm hang, s	CG	15±1.3	17±1.4	1.06	>0.05
	EG	14±1.2	22±1.5	3.88	<0.01

The results obtained are also consistent with the scientific approaches of N.Zh. Bulgakova, who emphasizes the importance of morphofunctional characteristics and physical preparedness levels in selecting young swimmers, as well as with the principles of E. Maglischo, according to whom training effectiveness is largely determined by the early identification of an athlete's individual characteristics and their ability to master swimming technique.

It was found that the athletes in the exper-

Table 3. Dynamics of special fitness indicators in young swimmers

Indicator	Group	Before (M±m)	After (M±m)	t	p
25 m swim, s	CG	24.5±0.6	23.8±0.7	0.94	>0.05
	EG	24.7±0.6	21.9±0.5	3.67	<0.01
50m swim, s	CG	52.3±1.2	50.8±1.3	1.12	>0.05
	EG	52.7±1.1	47.2±1.0	3.84	<0.01
Technique assessment (score)	CG	3.1±0.2	3.8±0.3	1.73	>0.05
	EG	3.0±0.2	4.5±0.2	4.05	<0.01

imental group demonstrated a higher level of swimming technique mastery and the ability to maintain a set speed over the distance, reflecting an increased level of special preparedness. This confirms the need for a comprehensive approach to selection, which includes the assessment of not only morphological and functional characteristics but also motor skills in the specific conditions of the aquatic environment.

To quantify the identified changes, a study was conducted on the dynamics of morphofunctional indicators in young swimmers from the control and experimental groups. The results of this analysis are presented in Table 1.

Analysis of the data presented in Table 1 shows different dynamics of morphofunctional indicators in the control and experimental groups. The control group exhibits minor positive changes, but they do not reach the level of statistical significance ($p>0.05$), which indicates the limited effectiveness of the traditional approach.

In the experimental group, by contrast, significant improvements were identified in most of the studied parameters. A statistically significant increase in height ($p<0.01$) and body mass ($p<0.05$) was recorded, reflecting a more pronounced dynamic of physical development. The most substantial changes were noted in functional indicators: vital lung capacity increased significantly, while Ruffier test scores decreased ($p<0.01$), which indicates an improvement in the functional state of the cardiovascular system and an increase in the body's adaptive capabilities.

The results obtained confirm that applying a comprehensive approach to preliminary selection contributes to the more effective development of the morphofunctional characteristics of young swimmers and increases the objectivity of assessing their potential.

To more fully characterize the impact of the proposed approach on the athletes' preparedness, the dynamics of physical fitness indicators were analyzed, the results of which are presented in Table 2.

Analysis of the data in Table 2 shows that the control group experienced slight positive changes in physical fitness indicators; however, these changes did not reach the level of statistical significance ($p>0.05$). This suggests that the traditional approach to selection and assessment does not ensure a marked increase in the key physical qualities of young swimmers.

In the experimental group, by contrast, statistically significant improvements were identified across all studied indicators ($p<0.01$). Specifically, there was a significant increase in speed abilities (30 m run), speed-strength qualities (standing long jump), flexibility (forward bend), and upper shoulder girdle muscle strength (pull-up bar hang). The most pronounced changes were recorded in the strength and speed-strength fitness indicators, which points to an increase in the subjects' overall physical preparedness.

The results obtained confirm that applying a comprehensive approach to preliminary selection contributes to the more effective development of the key physical qualities necessary for successful athletic performance in swimming.

To assess the impact of the proposed methodology on the special fitness level of the young swimmers, an analysis of the dynamics of their swimming performance indicators was conducted. The results are presented in Table 3.

An analysis of the data in Table 3 indicates different dynamics in the indicators of special preparedness between the control and experimental groups. The control group showed a slight improvement in their control swim re-

sults and swimming technique; however, these changes did not reach statistical significance ($p>0.05$), which points to the limited effectiveness of the traditional approach.

In the experimental group, by contrast, statistically significant positive changes were identified across all studied indicators ($p<0.01$). A substantial improvement was noted in swimming results at the 25- and 50-meter distances, reflecting an increase in speed and special endurance. Concurrently, a significant increase in technical preparedness indicators was recorded, which suggests a more effective mastery of efficient swimming technique and improved coordination of movements in the water.

The results obtained confirm that the application of a comprehensive approach to preliminary selection not only increases the level of general and functional fitness but also promotes the more effective development of special motor skills that directly determine athletic performance in swimming.

Conclusion

This study has shown that applying a comprehensive approach to assessing the potential of young swimmers during the preliminary selection stage is more effective than the traditional methodology. It was determined that using a combination of morphofunctional, physical, and sport-specific indicators allows for the reliable identification of athletes with the greatest potential for further development. The experimental group demonstrated statistically significant improvements in functional state, physical fitness level, and sport-specific preparedness indicators, including control swim results and the quality of swimming technique execution ($p<0.05–0.01$). It was proven that a comprehensive assessment system enhances the body's adaptive capabilities, promotes more effective development of key physical qualities, and accelerates the acquisition of swimming technique, which is an important prerequisite for successful sport specialization. Thus, implementing a comprehensive assessment of potential at the preliminary selection stage increases the objectivity of the selection process, optimizes training, and can be recommended for practical application in the training system for young swimmers.

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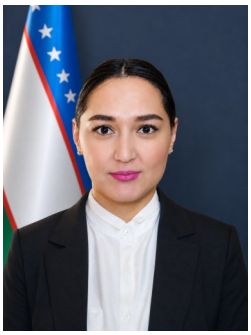
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