

SELECTING OF YOUNG SWIMMERS BASED ON ANTHROPOMETRIC AND MORPHOFUNCTIONAL INDICATORS

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Abstract:

The article provides recommendations for predicting the sports results of young swimmers based on their morphofunctional indicators and for optimizing the training process. The primary focus is directed towards classifying the factors that determine the effectiveness of selection, developing a model for selection based on anthropometric indicators, studying the influence of swimmers' body length in relation to standard biological development on sports results, and creating criteria aimed at improving the efficiency of selection.

Keywords: Swimming, young swimmers, selection, selection criteria, morphofunctional indicators, anthropometric indicators, standard biological development, physical development.

Introduction

Particular importance is being placed on improving the system for training sports reserves and highly qualified athletes across various sports, as well as on establishing systems for training children's coaches and conducting selection work in water sports in our Republic. A clear example of this is Presidential Decree No. RP-382, dated on November 4, 2024, "On Measures for the development of water sports". There are numerous issues awaiting solutions, such as supplying the national teams of Uzbekistan with young, talented, and capable athletes, and effectively selecting and directing them. Currently, there is a growing necessity to scientifically research and scientifically organize the selection of talented athletes at the initial preparatory stage of swimmer training. Sports practice has observed a negative trend associated with the premature achievement of high athletic results. This approach indicates a violation of the principles of swimmer selection and improvement across the stages and periods of multi-year training, thereby confirming the relevance of the chosen research direction.

The issues of selecting and directing swimmers are currently a focus of attention for specialists in the field. The extent to which the body structure of practitioners of various swimming styles influences their sports results has always been a subject of interest for experts. It is fair to say that it is advisable to direct practitioners with relatively long limbs and high flexibility in the hip joints towards breaststroke, those with long limbs, high muscle mass, and a strong kick

towards the front crawl for short distances, and those with high flexibility in the upper body towards the butterfly stroke [1,2,5,8].

The aim of the research is to analyze the morphofunctional indicators of athletes to assess the performance of young swimmers and, based on this, to improve the criteria for determining their future prospects.

The tasks of the research: to analyze the morphofunctional indicators of young swimmers; to compare the obtained data with model indicators.

Main Part

All applicants of the appropriate age for swimming are admitted to initial training groups in children's and youth sports schools. The criteria for sports orientation include a physical education teacher's recommendation, medical examination data, anthropometric measurements, and an assessment of their aptitude. In many cases, the criteria determining a child's athletic aptitude are established based on data regarding their height, weight, body composition, and motor abilities. Sports practice demonstrates that it is not always possible, at the initial stage of preparation, to identify children of a typical model type who embody the morphological, functional, and psychological qualities necessary for future specialization in a particular sport. The significant individual peculiarities in the biological development of children who have just begun training further complicate this task. Therefore, it is appropriate to consider the data obtained at this stage as approximate information [1,3,4].

Specialized research on selection in sports has led to the creation of various technologies for implementing work in this field. In our country, the unified selection system that has been established involves organizing specific measures that are intrinsically linked to multi-year preparation. The unified selection system envisages, within the framework of the organizational measures under consideration, the development of various selection models and the experimental testing of their effectiveness.

A model gains significant value only if it reflects the core characteristics of a planned system, aligns with the system's goals, objectives, and methods, considers the specifics of multi-year training stages, and adheres to the following principles:

1. The scientific substantiation of the selection technology and testing program.
2. The identification of acceptable forms for organizing the selection process.
3. The establishment of management tools and mechanisms for the selection system, which include monitoring and analyzing performance.

The anthropometric indicators of swimmers demonstrate a low correlation with swimming speed and it can be stated at the age of 8-9. During this period, a young swimmer's previously acquired experience and, consequently, their ability to maintain buoyancy in the water, have a significant impact on performance. In subsequent training stages, the mastery of specific aquatic motor skills reveals the advantage of relatively experienced swimmers, while a swimming-specific body structure becomes increasingly important for the improvement of a

swimmer's results. The recommended anthropometric model for various swimming strokes and specializations indicates that athletes who are tall, have long limbs, are slender, possess large feet, and have a high vital lung capacity demonstrate an advantage over other swimmers. This scientifically-grounded model substantiates the views advanced by highly qualified coaches, who are able to identify talented swimmers not merely through a combination of intuition, extensive experience, and sound judgment, but through a validated framework [4,6,7].

Predicting the eventual adult height of a novice athlete is of significant importance for forecasting sports results in swimming. This is because the swimmer's height directly correlates with the proportionality of other body segments crucial for swimming—such as the arms, legs, torso, and foot length—all of which have a direct impact on athletic performance. For instance, a child reaches approximately 86% of their future adult height by the age of 12. In the prediction process, it is appropriate to treat the obtained results not as definitive outcomes, but rather as projected expectations.

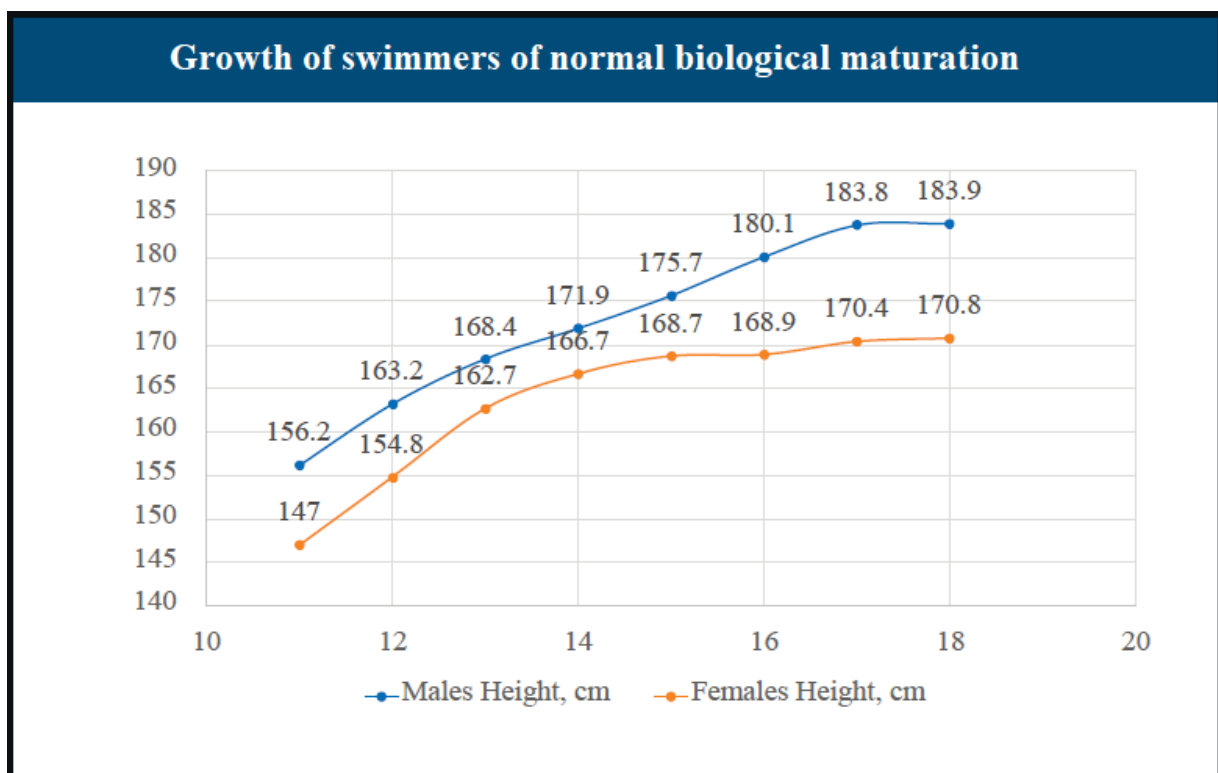


Figure 1. Growth dynamics of athletes' height during normative biological development.

A moderate growth in height is observed between the ages of 11 and 15 for boys who're involved in swimming. A sharp growth spurt is observed between the ages of 15 and 18. For girls involved in swimming, however, the growth pattern is different; a sharp growth spurt is observed between 11 and 14 years of age, while a period of moderation is observed between 15 and 18 years (Figure 1).

Analysis of local and international scientific literature, interviews with field specialists, and our own long-term observations and experiments have allowed us to develop a comprehensive set of criteria for selecting talented athletes at the initial specialization stage for 11-13 year-old boys engaged in swimming (Table 1).

Table 1. Criteria for selecting criteria of 11-13 years old talented swimmers at the initial specialization stage (boys)

Assessment of potential level		Low	Low to Average	Average	Average to High	High
Indicators / Category		1	2	3	4	5
Morphofunctional Indicators	height of body, cm	137,6-142,7	142,8-148,9	149,0-158,4	158,5-163,6	163,7-168,8
	Weight of body, kg	25,0-30,5	30,6-36,0	36,1-47,2	47,3-54,8	54,9-58,4
	Length of arm, cm	58,2-61,5	61,6-64,8	64,9-71,6	71,7-75,0	75,1-78,4
	Length of leg, cm	71,9-75,6	75,7-79,4	79,5-87,1	87,2-90,9	91,0-94,8
	Width of shoulder, cm	26,5-28,2	28,3-30,0	30,1-33,6	33,7-35,5	35,6-37,2
	Width of pelvic, cm	30,7-29,7	29,6-27,9	27,8-24,3	24,2-22,5	22,4-20,7
	Length of foot, cm	16,0-18,0	18,1-20,0	20,1-24,5	24,6-26,5	26,6-28,6
	Width of foot, cm	7,1-7,5	7,6-8,0	8,1-8,8	8,9-9,3	9,4-9,8
	Vital Capacity (VC), ml	1780-1960	1961-2200	2201-2685	2686-2930	2931-3175

The comprehensive selection criteria encompassed screening based on morphofunctional indicators, as well as physical and technical preparedness. It is important to note that athletes demonstrating average and above-average indicators, which align with the model parameters we recommend based on the results, indicate a high potential for the individual engaged in the sport of swimming.

Long-term data indicate that participants whose metrics exceed the given model parameters achieve higher results in swimming and demonstrate a propensity for superior training outcomes in the future. However, this trend is subject to significant limitations associated with the biological maturation spread among young athletes. The research results suggest that swimmers who are biologically more mature than their peers at a young age are often observed to have superior sports results compared to swimmers whose biological and chronological ages are aligned. It can be concluded that later-maturing young athletes possess a greater potential for future performance improvement and tend to remain in high-performance sport for a longer duration.

Conclusion

Studying the anthropometric indicators of highly qualified athletes has traditionally been a focus of researchers. Although the anthropometric characteristics of winners and medalists in international swimming competitions vary considerably, their overall physique—typically tall with long limbs—demonstrates the predominance of a mesomorphic somatotype. Sprinters and middle-distance swimmers (both male and female) are notably distinct from swimmers specializing in other strokes, exhibiting the greatest values in body height, weight, and surface

area. In swimming, the athletic performance of competitors is directly dependent on their body structure.

The factors influencing selection were studied in detail in order to enhance the efficacy of selecting young swimmers,. Based on a classification of these factors by their degree of influence, it was determined that anthropometric factors are the most significant, and a high correlation exists between anthropometric indicators and sports results.

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