

METHODS OF SELECTING SCHOOL CHILDREN FOR COMPETITIVE SWIMMING

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Abstract

This article is devoted to the analysis of modern methods and mechanisms for selecting schoolchildren for competitive swimming. The research comprehensively examines pedagogical, psychological, and medico-biological criteria for identifying gifted children at the initial training stage. The article highlights the stages of the selection process, the importance of anthropometric indicators, special qualities (such as water feel), and motivational factors. The effectiveness of advanced international practices and selection models based on modern machine learning technologies is also analyzed. The research results have enabled the development of practical recommendations aimed at improving the system for selecting schoolchildren in swimming.

Keywords: swimming, sports selection, schoolchildren, talent identification, anthropometry, water feel, psychological criteria.

Introduction

Modern competitive swimming is developing at a rapid pace, world records are constantly being updated, and competition is intensifying. In such conditions, achieving high results is only possible for gifted athletes with special abilities. Global practice and scientific research show that the highest achievements in swimming are attained only by athletes possessing unique morphological characteristics, a high level of physical and mental abilities, as well as technical and tactical skills [4]. For this very reason, the issue of early identification and proper guidance of gifted children is extremely relevant.



Selecting school-aged children for the sport of swimming not only determines the effectiveness of sports schools and coaches but also has profound social significance. Successful engagement in sports helps the younger generation realize their natural abilities, build self-confidence, and form important personal qualities such as diligence and goal orientation. This, in turn, creates a solid foundation for them to find their place in life and adopt an active position in society in the future [6].

Analysis of Literature on the Topic

An analysis of scientific literature on the issues of selection for swimming shows that this problem has long attracted the attention of researchers and practitioners. The works of scholars such as N.J. Bulgakova, R.E. Motilyanskaya, V.M. Volkov, and V.R. Malkin detail the theoretical and methodological foundations of sports selection, as well as the principles and criteria for identifying gifted children [2, 4, 6].

Analysis of contemporary research indicates that selection for swimming is not a one-time event but a continuous process closely linked to the stages of an athlete's long-term preparation. Experts distinguish five main stages of selection: initial, preliminary, intermediate, main, and final. Each stage has its own tasks, criteria, and methods [4].

At the initial selection stage, the feasibility of a child engaging in swimming is determined. At this stage, the following criteria are mainly used: favorable age for starting swimming, absence of serious health deviations, conformity of the morphotype to the requirements of swimming, and the level of motor abilities [4, 6].

Analysis of international experience shows that the Chen Jinglun Sports School in Hangzhou, China, has extensive experience in selecting children gifted for swimming. Every year, about 800 children are involved in the summer selection school here. The selection process consists of several stages: initial screening (body composition, motor skills), a 45-day trial period (water feel, balance, movement efficiency), and subsequent observation during a year of systematic training [1, 3].

The "Talent Tracking System for Competitive Swimming" developed by Cuban scientists M.W. Hernández-Barcaz and colleagues deserves special attention.



This system is aimed at the early identification and continuous development of young swimmers and is based on the principle of optimally utilizing the athlete's full potential [5].

In recent years, modern technologies, particularly machine learning methods, have been introduced into the selection process. In a study conducted by Xu Bingxiang and colleagues, a model for predicting swimming talent was developed using the Random Forest algorithm based on anthropometric and physiological data of 5444 participants aged 10-18. The model identified abdominal skinfold thickness, lung capacity, chest circumference, shoulder width, and triceps skinfold thickness as the five most important indicators [7].

Analysis and Results

The results obtained during the study allowed revealing important aspects of the process of selecting schoolchildren for competitive swimming.

Effectiveness of Selection Stages

Observations showed that a multi-stage selection system is significantly more effective than one-time tests. Out of an initial 124 children, 38 (30.6%) were selected for the next stage after a 45-day trial period. After one year of training, 12 of them (31.6%) were considered promising. These indicators align with data cited in the literature: after initial selection, 10-12% remain, and after preliminary training, 15-20% [4].

Anthropometric indicators, particularly body length, arm and leg length, hand and foot size, and shoulder width, are important criteria for identifying children gifted for swimming. However, these indicators are not absolute and must be assessed in conjunction with other criteria. The ability to feel the water is the most crucial special quality for swimming; it is highly heritable and develops to a limited extent under the influence of training. Therefore, special attention should be paid to identifying this quality during initial selection.

Analysis of Anthropometric Indicators

The anthropometric indicators of the children identified as promising in the study differed significantly from those of other children (Table 1).

Table 1. Anthropometric Indicators of Promising and Regular Swimmers (Aged 7-10)

No.	Indicators	Promising Children (n=12)	Regular Children (n=112)	Difference
1.	Body Length (cm)	138.6 ± 4.2	132.4 ± 5.1	+6.2
2.	Body Weight (kg)	32.4 ± 3.1	31.8 ± 4.3	+0.6
3.	Arm Length (cm)	62.3 ± 2.4	58.7 ± 2.8	+3.6
4.	Leg Length (cm)	74.2 ± 3.1	70.5 ± 3.6	+3.7
5.	Hand Length (cm)	15.8 ± 0.9	14.2 ± 1.1	+1.6
6.	Foot Length (cm)	21.6 ± 1.2	19.4 ± 1.4	+2.2
7.	Shoulder Width (cm)	29.4 ± 1.5	27.8 ± 1.7	+1.6
8.	Chest Circumference (cm)	67.8 ± 2.3	64.2 ± 2.8	+3.6

The data in the table show that promising children differ significantly from regular children, especially in body length, arm and leg length, and hand and foot size. These results are consistent with the important indicators identified by Chinese scientists based on the Random Forest model [7].

Functional Indicators

It was also found that promising children have higher indicators in terms of lung capacity and breath-holding ability (Table 2).

Table 2. Functional Indicators of Promising and Regular Swimmers

No.	Indicators	Promising Children (n=12)	Regular Children (n=112)	Difference
1.	Lung Capacity (l)	2.4 ± 0.3	1.9 ± 0.4	+0.5
2.	Breath Holding (sec)	34.6 ± 4.2	26.8 ± 5.1	+7.8

Assessment of Specific Water Abilities

During the study, the "water feel" ability was identified as one of the most important criteria. 83% of promising children possessed a high level of water feel



ability, whereas this indicator was only 24% among regular children. Promising children also showed significantly higher results in maintaining balance in the water (buoyancy) and movement efficiency. This confirms the opinion of coaches at the Hangzhou sports school: anthropometric indicators are important, but the decisive factor is the ability to feel the water [1, 3].

Analysis of Psychological Factors

The results of psychological testing showed that among promising children, those with sanguine (50%) and phlegmatic (33%) temperament types predominate. Choleric accounted for 17%, while melancholics were not found at all. Regarding psychotype, 67% of promising children were introverts, and 33% were extroverts. These results align with the research of T.A. Darvish and others [2]. Promising children also differed in their level of motivation. 75% of them had a high level of intrinsic motivation (desire to achieve high results in sports), whereas among regular children, the main motivation was found to be external factors (parental or coach demand).

Interrelation of Selection Criteria

The results of statistical analysis showed an interrelation among the selection criteria. The highest correlation was found between water feel and movement efficiency ($r=0.78$). Anthropometric indicators (especially arm length) had a moderate correlation with swimming speed ($r=0.54$). The level of motivation showed a high correlation with continuing long-term training and improving results ($r=0.72$).

Conclusion and Recommendations

The results of the research on methods for selecting schoolchildren for competitive swimming allow drawing the following conclusions:

1. Selection for the sport of swimming is a continuous and multi-stage process that must be organized considering the age characteristics, physical development dynamics, and psychological factors of children. One-time tests are not sufficiently effective in identifying gifted children.
2. An integrated approach in the selection process, i.e., the combined use of pedagogical, psychological, and medico-biological methods, is the most

effective. Each method has its own advantages and limitations, and their combined use increases the reliability of selection.

3. At the initial selection stage, it is advisable to focus primarily on genetically determined, relatively stable traits (anthropometric indicators, water feel ability). In subsequent stages, qualities that develop under the influence of training (physical fitness, technical skills) become more important.

4. Psychological factors, particularly intrinsic motivation for swimming, goal orientation, and temperament type (sanguine and phlegmatic), play a decisive role in achieving long-term sports results. Children with a high level of intrinsic motivation are more inclined to continue training and achieve high results.

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