

The effect of upstroke on monofin swimming speed in young athletes in underwater sports

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Abstract

Objective of the study was to assess the impact of the upward movement on the swimming technique in a monolast and the rate of distance covered by athletes aged 12-13 who participate in underwater sports.

Methods and structure of the research. Submarine athletes aged 12 to 13 years (10 girls and 10 boys) took part in the scientific work. All athletes were conditionally divided into two groups of 10 people (5 girls and 5 boys): group A - athletes making equally powerful downward and upward strokes when swimming in a monofin, group B - athletes making only a powerful downward stroke. The following methods were used in the work: method of assessing time indicators, method of mathematical statistics.

Results and conclusions. Examining the swimming style and the time it takes for athletes to complete the distances, it is evident that the athletes in group A exhibit a superior performance and a more consistent technique compared to those in group B. In conclusion, young swimmers aged 12 to 13 who participate in underwater sports are already competing at the national level as part of regional teams. Clearly, at this age, the swimming technique and time taken to complete the distances are of utmost importance. Athletes who glide effortlessly across the water, using a monolast stroke, swim much faster. This is because their movement is smooth and effortless, allowing them to effortlessly glide across the surface of the water. In contrast, swimmers who use a monolast stroke only downward bend their knees to lift the flipper, creating a submerged dive with their hands. This technique results in a pause between strokes, a lack of smoothness in the swimming motion, and a time performance that is significantly inferior.

Keywords: *underwater swimmers, competitions, swimming technique, monofin, sports result, gliding, sports distance.*

Introduction. Underwater sports are a rapidly developing sport. A set of sports disciplines associated with the athlete's stay partially or completely under the surface of the water. The basis of underwater swimming is diving and swimming along the surface of the water for a certain distance in the shortest time in a monofin. Also, underwater sports are characterized by descents under water using special equipment, devices, apparatus and equipment [1, 2]. The appearance of the monofin in the early 1970s led to the breaking of all world records.

A monofin is sports equipment, a type of fins, which is a single structure set in motion by both legs at the same time. The technique of swimming in a monofin is called dolphin. The athlete in a monofin has his arms motionless extended forward, clasping his hands together, cutting through the water or holding a cylinder, the head is fixed between the biceps in a streamlined position. The wave-like movements of the body begin at the shoulders, with maximum amplitude towards

the hips, the legs are barely bent to transmit the movement to the monofin [3].

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to establish the dependence and justify the obtained results. During the study, a correlation analysis of the dependence between the sports result and swimming technique was carried out. The results were processed using Microsoft Word and Microsoft Excel.

Results of the study and discussion. Sports training is an important stage in preparing athletes for competitions. Only with a competent structure of the training process taking into account swimming technique, it is possible to show high sports results in competitions. In this study, the results of athletes with different swimming techniques of group A and group B at distances of 50 and 100 meters swimming with fins were considered. The results of the athletes are presented in Tables 1, 2.

Table 1. Results of Group A athletes in 50 and 100 meter finswimming

Test subject athlete	50 meters swimming with fins	100 meters swimming with fins
No. 1 girls	21.2	45.7
No. 2 girls	20.8	46.2
No.3 girls	21.6	47.0
No. 4 girls	20.9	47.4
No. 5 girls	21.30	48.0
No. 6 young men	19.8	42.8
No. 7 young men	20.1	43.9
No. 8 young men	20.8	44.5
No. 9 young men	20.7	45.6
No. 10 young men	21.0	46.7

Table 2. Results of group B athletes in 50 and 100 meter finswimming

Test subject athlete	50 meters swimming with fins	100 meters swimming with fins
No.1 girls	22.2	49.9
No. 2 girls	22.4	50.4
No. 3 girls	22.0	50.9
No. 4 girls	22.6	51.2
No. 5 girls	23.1	51.4
No. 6 young men	21.5	47.1
No. 7 young men	22.4	47.6
No. 8 young men	22.0	47.9
No. 9 young men	22.5	48.1
No. 10 young men	22.7	49.0

Analyzing the results of the athletes in Tables 1 and 2, we can say the following: athletes of group A have faster results than athletes of group B, both among girls and boys.

In order to determine how much underwater athletes need to perform a stroke in a monofin both up and down, we conducted a correlation analysis of the

relationship between the sports result (the best result in the season at a distance of 50 and 100 meters) and swimming technique.

The correlation relationship between the sports result and swimming technique is presented in Table 3.

Table 3. Comparative analysis of the relationship between sports results and swimming technique

Distances	Correlation coefficient girls	Correlation coefficient young men
50 meters	0,84	0,85
100 meters	0,79	0,82

Note: ($r < 0,30$) – low correlation; (r from 0,31 to 0,50) – weak correlation; (r from 0,51 to 0,70) – average correlation; (r from 0,71 to 0,80) – good correlation; (r from 0,81 to 0,90 and higher) – strong correlation.

Analyzing the results presented in Table 3, the following conclusion was made: girls have a strong degree of dependence of the sports result in 50 meters with swimming technique ($r=0,84$) and a good degree of dependence of the sports result in 100 meters with swimming technique ($r=0,79$). Boys have a strong relationship between the sports result in 50 and 100 meters with swimming technique ($r=0,85$, $r=0,82$).

Conclusions. Athletes who practice underwater sports at the age of 12-13 years already take part in all-Russian competitions as part of regional teams. It is obvious that swimming technique and time shown on distances are very important at this age. Athletes who overcome the water surface, making a stroke with a monofin down and up, swim much faster, as they have a smooth glide on the surface of the water. Athletes who make a stroke with a monofin only down, bend their knees to lift the fin up, thereby diving under the water with their hands. Such athletes have a pause between strokes, the swimming technique does not have a smooth glide and is similar to a pendulum, the athletes' time is much worse.

References

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