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## MONITORING THE DIFFERENCE IN THE LEVEL OF FORMATION OF SWIMMING SKILLS AMONG SWIMMERS-WINNERS OF MEN AND WOMEN AT THE XIX WORLD AQUATICS CHAMPIONSHIPS IN BUDAPEST – 2022

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### Abstract

**Aim.** This study aimed to determine the difference in the parameters of the level and degree of motor swimming skills formation among winner swimmers based on monitoring the results of the final swims at the XIX World Aquatics Championships in Budapest, held on June 18-30, 2022.

**Methods.** Theoretical analysis of literary sources and practice experience, monitoring ascertaining experiment, generalization of documentary materials and mathematical statistics. The best final achievements of athletes among 114 men and 115 women at all 49 distances of sports and marathon swimming were established according to the program of these prestigious competitions.

**Results.** For the first time, the dynamics of formation of motor swimming skills according to the possibilities of overcoming distances by different methods of swimming depending on the gender difference of participants by almost similar age (men,  $x \pm m = 23.85 \pm 1.65$ ; women,  $x \pm m = 22.64 \pm 2.23$ ;  $t = 0.039$ ,  $p > 0.05$ ) and a significant difference between the achievements of men and women (men,  $x \pm m = 1.84 \pm 0.18$ ; women,  $x \pm m = 1.67 \pm 0.16$ ;  $t = 9.097$ ,  $p < 0.05$ ) at the final starts of the XIX World Swimming Championships in 2022.

Thus, the biggest difference was recorded in freestyle swimming for short and medium distances – 0.22 m/s, butterfly swimming – 0.20 m/s, backstroke swimming – 0.20 m/s and relay swimming – 0.20 m/s, breaststroke – 0.19 m/s, then in medley – 0.17 m/s, and the smallest difference was recorded at stayer freestyle distances – 0.12 m/s, in marathon – 0.12 m/s and joint relay races – 0.11 m/s. Thus, the overall difference between the average swimming speed in men and women at all swimming distances is above - 0.17 m/s (men,  $x \pm m = 1.84 \pm 0.18$ ; women,  $x \pm m = 1.67 \pm 0.16$ ;  $t = 9.097$ ,  $p < 0.05$ ).

**Conclusions.** The dynamics of the formation of motor swimming skills according to the possibilities of overcoming different swimming distances depending on the gender difference of the participants of the final races at a similar age at the XIX World Swimming Championships 2022 has been carefully studied. The biggest difference in average swimming speed was recorded: 50 m – 0.235 m/s, 100 m – 0.205 m/s and relay swimming – 0.203 m/s, 200 m – 0.172 m/s, 400 m and stayer swimming distances – 800-1500 m – 0.135 m/s, and the slightest difference was observed in marathon swimming – 0.12 m/s and compatible relay races – 0.11 m/s. The overall difference in indicators is more than 0.17 m/s.

**Keywords:** World Swimming Championships, men swimmers, women swimmers, swimming distances, state of achievements of the winners, average speed, achievement score.

### Introduction

As the experience of theory and practice shows, the World Aquatics Championships are the largest international competitions held under the control of The International Swimming Federation (FINA). They include swimming in the pool and in the open water – marathon swimming since 1991, and diving, water polo and synchronized swimming. The swimming program was gradually supplemented and expanded, ranging from 29 to 34 species by 1991, as well as to 49 species in total among women and men. Therefore, the possibilities of swimmers to take part in these prestigious competitions of our time are expanding in order to show the parameters of a more reliable formation of motor skills of sports and marathon swimming.

At the present stage of development of sports swimming, more reliable data on the importance of various possibilities for the realization of potential physical abilities in achieving the best results of men and women, age and vocational training, improving motor swimming skills to overcome different distances, and applying different methods of swimming. Objective information about the similarity and difference in the formation of motor swimming skills of representatives of different sexes, ages and qualifications will allow to optimal substantiation, development and introduction of objective criteria for the sports selection of performers. This will make it possible to determine their

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readiness for reliable performance at prestigious competitions based on the adoption of appropriate regulatory and evaluation functions in various parts of the modern system of physical education and sports.

Specific information on the state of the current parameters of the difference in the formation of swimming skills among young people and adults, taking into account their gender, is very sporadically and fragmentary, as evidenced by publications on the theory and methodology of physical education and sports (Ganchar, 2015-a, 2015-b, 2015-c, 2015-d, 2015-e; Ganchar, 2017; Ganchar, Terentieva & Ganchar, 2018). There are also quite convincing publications about the specifics of teaching women and men similar opportunities for the formation of swimming skills as domestic authors (Platonov, 2004; Firsov, 1976), and comprehensively also given in foreign informative sources of literature and practice (Maglischo, 2003; Hannula, 2001; Schubert, 1990, [www.fina.org](http://www.fina.org), [www.swimrankings.net](http://www.swimrankings.net), [www.omegatiming.com](http://www.omegatiming.com)).

### **Objectives**

The aim of this study is to determine the level and degree of parameters of the formation of motor swimming skills in swimmers-winners based on monitoring the results of the final swims at the XIX World Aquatics Championships, which took place in June 2022. Based on the formulation of research objectives, a suitable object of study was selected: the dynamics of the formation of swimming skills among young people and adults at the present stage of the formation of sports and marathon swimming skills. The subject of the study was the peculiarities of similarity and differences in the parameters of the formation of swimming skills among representatives of different sexes and ages at the XIX World Aquatics Championships (June 18-30, 2022, Budapest).

The objectives of the study were: 1) determining differences in the levels of parameters of the formation of motor swimming skills among elite swimmers in accordance with the practice of holding prestigious competitions at the XIX World Swimming Championships in Budapest-2022; 2) application of the most noticeable results of the conducted research in modern practice experience to possibly improve the formation of motor swimming skills in different age groups. The main research methods used were: theoretical analysis of literary sources and experience of practice, monitoring stating experiment, generalization of documentary materials and mathematical statistics.

### **Methods**

The main research methods were: theoretical analysis of literary sources and practice experience, monitoring and experimentation, generalization of documentary materials and mathematical statistics. Theoretical analysis of literature relating to the problem (15 sources of literature and practice experience, well-known specialists and specialists), generalization of documentary materials: (analysis of 3 official protocols with the participation of 179 countries, conducted on June 18-25 and 26-30, 2022 of the XIX World Championship in Budapest, Hungary, which are posted on the websites: [www.fina.org](http://www.fina.org) [www.swimrankings.net](http://www.swimrankings.net); [www.omegatiming.com](http://www.omegatiming.com); comparative stating experiment: with its help, data were obtained that made it possible to compare the generalized averages in the achievements of swimmers-winners at the XIX World Championships in 2022, among men (114) and women (115) at all 49 distances of sports and marathon swimming, who received gold, silver and bronze medals among the strongest swimmers-winners from 19 countries; mathematical statistics (this is necessary to determine the average indicators of calculating their reliability  $p < > 0.05$  achievements of swimmers at different distances).

### **Results**

Consideration of the final starts of the XIX World Championship allows us to study the state of formation of motor swimming skills among the strongest swimmers-winners from 19 countries at different distances, as well as to determine the peculiarities of the dynamics of results between men and women in different age groups (Table 1). According to the above materials, the most successful (of the 179 countries of the world that took part) was the performance of swimmers USA-45 medals, Australia-17, Italy-9 sports and +6 marathon swimming, Canada-11, France-8+2, Germany-4+5, China-5, Great Britain-5, Brazil-2+3 and Hungary-2+2 medals. The second ten teams included: Netherlands-2+2 medals, Japan-4, Sweden-4, Romania-2, Lithuania-2, Poland-2, Ukraine-1+1, South Korea-1, South Africa-1 medal. Therefore, the overall result of the rating of the performance of the strongest swimmers in the world was the indicator of the awards received by the best swimmers-winners from 19 countries at the XIX World Championships in Budapest.

Table 1. Swimming at the XIX World Aquatics Championships, Budapest 2022, Hungary (according to the number of prize awards received by teams from 19 countries out of 179 participants)

№ rating	Medals of 19 countries between 179 participants	Gold		Silver		Silver		Just		Together men+women
		men	women	men	women	men	women	men	women	
1.	United States	8	9	7	5	7	9	22	23	45
2.	Australia	3	3	3	6	-	2	6	11	17
3.	Italy	4+2	1	1+2	1	1	1+2	6+4	3+2	9+6
4.	Canada	-	3	1	3	2	2	3	8	11
5.	France	2	-	2+1	2+1	1	1	5+1	3+1	8+2
6.	Germany	+1	+1	2	1+2	1+1	-	3+2	1+3	4+5
7.	China	-	1	-	-	-	4	-	5	5
8.	Great Britain	1	-	1	-	3	-	5		5
9.	Brazil	-	+2	1	-	1	+1	2	+3	2+3
10.	Hungary	2	-	-	+1	+1	-	2+1	+1	2+2
11.	Netherlands	-	+1	1	-	1	+1	2	+2	2+2
12.	Japan	-	-	2	-	2	-	4	-	4
13.	Sweden	-	2	1	1	-	-	1	3	4
14.	Romania	2	-	-	-	-	-	2	-	2
15.	Lithuania	-	1	-	-	-	1	-	2	2
16.	Poland	-	-	-	1	1	-	1	1	2
17.	Ukraine	-	-	-	-	1+1	-	1+1	-	1+1
18.	South Korea	-	-	1	-	-	-	1	-	1
19.	South Africa	-	-	-	-	1	-	1	-	1
Medals total received		22+3	20+4	22+3	20+4	22+3	20+4	66+9	60+12	126+21

Notes: the + badge - indicates the medal received in open water swimming (marathon); in the joint relay of 4×1500 m (2 people + 2 women), the prize medals are indicated for women, and 2 adjacent relays are given in men

Among the men swimmers, the most successful were the following: USA-22 medals, Italy-6+4 marathon, Australia-6, France-5+1, Great Britain-5, Germany-3+2, Japan-4, Canada-3, Hungary-2+1, Brazil-2, Netherlands-2, Romania-2, Ukraine-1+1marathon. Women swimmers also had athletes: USA-23 medals, Australia-11, Canada-8, China-5, Italy-3+2, France-3+1, Germany-1+3, Brazil-+3, Sweden-3, Lithuania-2, Netherlands-+2.

According to the indicators in Table 2, the largest difference in the age of participants between men and women was found in 14 cases in the range from 1-5 years. The absence of age difference in men from women was observed in 5 cases: 50 m, 800 m freestyle, 200 m breaststroke, 100 m butterfly and marathon joint relay 4×1500 m (men,  $x \pm m = 23.85 \pm 1.65$ ; women.,  $x \pm m = 22.64 \pm 2.23$ ;  $t=0,039$ ;  $p>0.05$ ). Meanwhile, the predominance of the age of women over men occurred in 7 cases, namely: 100 m, 400 m freestyle, and 50 m on the backstroke, 200 m butterfly and in marathon swimming at 5000 m, 10000 m, and 25000 m from 1 to 3 years.

Table 2. Summary table of average results of winners and runners-up of the final swims and the age of participants of the World Aquatics Championships Budapest 2022, Hungary

The results of swimmers			Distance, swimming strokes	Age of swimmers, years		
men	women	difference		men=114	women=115	± difference
21.43	24.23	2,80	50 m freestyle	25	25	0
47.64	52.79	5,15	100 m c freestyle	20	22	2+
1.44.22	1.55.46	11.24	200 m freestyle	20	19	+1
3.42.46	3.59.21	16,75	400 m freestyle	22	23	1+
7.39.68	8.15.27	35.59	800 m freestyle	25	25	0
14.35.31	15.41.33	1.06.02	1500 m freestyle	25	20	+5
24,25	27.36	3.11	50 m backstroke	21	23	2+
51.85	58.43	6,58	100 m backstroke	23	21	+2
1.55.01	2.05.72	10,71	200 m backstroke	25	21	+4
26.55	29.80	3.25	50 m breaststroke	25	20	+5
58.51	1.05.97	7,46	100 m breaststroke	26	21	+5
2.07.94	2.22.88	14,94	200 m breaststroke	24	24	0
22.71	25.19	2.48	50 m butterfly	30	28	+2
50.68	56.06	5,38	100 m butterfly	23	23	0
1.52.44	2.05.86	13.42	200 m butterfly	21	23	2+
1.55.71	2.08.20	12.49	200 m medley	23	19	+4

4.06.10	4.33.57	27,47	400 m medley	23	18	+5
3.10.36	3.31.89	21.53	4×100 m freestyle	24	22	+2
7.02.58	7.43.35	40,77	4×200 m freestyle	23	21	+2
3.28.87	3.54.34	25,47	4×100 m medley	22	21	+1
2 men	2 women	3.20.36	4×100 m freestyle mixed	-	-	-
47.45=94.9	52.4=104.8	9.9	4×100 m freestyle mixed	23	21	+2
2 men	2 women	3.40.55	4×100 m medley mixed	-	-	-
1.49,66	1.50,88	1,22	4×100 m medley mixed	24	22	+2
52.71.8	57.53.9	4.82.1	5000 m the marathon	26	29	3+
1.50.75.4	2.02.29.5	11,54.1	10000 m the marathon	27	28	1+
5.02.26.5	5.24.15.2	21.88.7	25000 m the marathon	26	27	1+
1.04.42.2	1.04.42.2	-	4×1500 m the marathon mixed	25	25	0

Age difference: men,  $x\pm m=23,85\pm 1,65$ ; women,  $x\pm m = 22,64\pm 2,23$ ;  $t= 0,039$ ;  $p>0,05$

The difference between the results of men and women is most characteristically reflected by calculations of the average swimming speed. They manifest themselves both by various means of swimming and in accordance with an increase in the length of the distance covered. Therefore, the results of the swimmers-winners should be considered in the ratio of the average speed of swimming at certain distances, as well as overcoming one or another means of swimming (Table 3).

Table 3. Dynamics of differences in the results of the formation of swimming skills in men and women of the swimmers-winners of the World Aquatics Championships in Budapest-2022, Hungary

Distance, m	Average swimming speed, distance: m/s, men / women	Difference in average swimming speed men/women, m/s	Difference in swimming distance, men/women, m/s	Difference between men/women swimmers, m/s
50 m freestyle	50:21,43 -50:24,23	2,33-2,06=0,27	0,22	
100 m freestyle	100:47,64-100:52,79	2,10-1,89=0,21		
200 m freestyle	200:1.44,22-200:1.55,46	1,92-1,73=0,19		
400 m freestyle	400:3.42,46-400:3.59,21	1,80-1,67=0,13	0,12	
800 m freestyle	800:7.39,68-800:8.15,27	1,74-1,62=0,12		
1500 m freestyle	1500:14.35,31-1500:15.41,33	1,71-1,59=0,12		
50 m backstroke	50:24,25-50:27,36	2.06-1.82=0,24	0,20	
100 m backstroke	100:51,85-100:58,43	1,93-1,71=0,22		
200 m backstroke	200:1,55,01-200:2.05,72	1,74-1,59=0,15		
50 m breaststroke	50:26,55-50:29,80	1,88-1,67=0,21	0,19	
100 m breaststroke	100:58,51-100:1.05,97	1,71-1,51=0,20		0,17±0,17
200 m breaststroke	200:2.07,94-200:2.22,88	1,56-1,40=0,16		$t= 9,097$ ,
50 m butterfly	50:22,71-50:25,19	2,20-1,98=0,22	0,20	$p<0,05$
100 m butterfly	100:50,68-100:56,06	1,97-1,78=0,19		1.53:9=0,17
200 m butterfly	200:1.52,44-200:2.05,86	1,78-1,59=0,19		
200 m medley	200:1.55,71-200:2.08,20	1,73-1,56=0,17	0,17	
400 m medley	400:4.06,10-400:4.33,57	1,63-1,46=0,17		
4×100 m freestyle relay	400:3.10,36-400:3.31,89	2,10-1,88=0,22	0,20	
4×200 m freestyle relay	800:7.02,58-800:7.43,35	1,89-1,72=0,17		
4×100 m medley relay	400:3.28,87-400:3.54,34	1,92-1,70=0,22		
4×100 m freestyle mixed	200:1.34,90-200:1.44,80	2.10-1.90=0.20	0,11	
4×100 m medley mixed	200:1.49,66-200:1.50,88	1,82-1.80=0.02		
5000 m marathon	5 km:52.71,8-5 km:57.53,9	1,56-1,44=0,12	0,12	
10000 m marathon	10 km:110.75,4-10km:122.29,5	1,50-1,36=0,14		
25000 m marathon	25 km:302.26,5-25 km:324.15,2	1,38-1,28=0,10		
4×1500 m marathon mixed	6 km:64.42,2= a/s*1.54 m/s	1,54		

Notes: with an icon «a/s\*» the average swimming speed for a participant in the competition is indicated: 2 men+2 women  
Difference in average swimming speed, m/s: men,  $x\pm m=1,84\pm 0,18$ ; women,  $x\pm m = 1,67\pm 0,16$ ;  $t= 9,097$ ,  $p<0,05$

The greatest difference between men's and women's results is manifested in freestyle swimming – 0.22 m/s, then in backstroke swimming, butterfly swimming and relay swimming – 0.20 m/s, dales in breaststroke swimming – 0.19 m/s, medley swimming – 0.17 m/s, and the slightest difference concerns stables freestyle swimming, marathon swimming – 0.12 m/s and medley relays – 0.11 m/s (the general difference between average swimming speed is, over: men,  $x\pm m=1,84\pm 0,18$ ; women,  $x\pm m = 1,67\pm 0,16$ ;  $t= 9,097$ ,  $p<0,05$ ).

Table 4 shows the overall results of the difference in the indicators of the average speed of overcoming all distances in different ways of swimming among men and women swimmers-winners and the age of the participants of the

winners of the final swims in different ways of swimming at the XIX World Championships in Budapest-2022. This is clearly evidenced by the indicators of the formation of motor swimming skills according to these indicators of Table 4, which shows the general results of the difference in indicators of the average speed of overcoming distances in different ways of swimming among men and women at certain distances.

Also, men have a higher level of results than women: 50 – 0.235 m/s, then 100 m – 0.205 m/s, then relay swimming – 0.203 m/s, distances in swimming 200 m – 0.172 m/s, as well as in swimming stable distances in freestyle – 0.135 m/s, Lower differences in average swimming speed became a characteristic feature for swimming at marathon swimming distances – 0.12 m/s and distances in compatible relays – 0.11 m/s. Consequently, the total difference in average swimming speed is more than – 0.17 m/s (men,  $x \pm m = 1.84 \pm 0.18$ ; women,  $x \pm m = 1.67 \pm 0.16$ ;  $t = 9.097$ ,  $p < 0.05$ ).

Table 4. Dynamics of differences in the results of the formation of swimming skills in men and women of the winners of the World Aquatics Championships in Budapest-2022, Hungary

Distance (m), swimming stroke	Average swimming speed, distance, time, m/s, men /women	The difference between the average swimming speed, men /women	The rank of the difference between distance and stroke of swimming, m/s, men/women.	Difference of results, m/s, men/women
50 m freestyle	50:21,43 -50:24,23	2,33-2,06=0,27	0.235	
50 m backstroke	50:24,25-50:27,36	2,06-1,82=0,24		
50 m breaststroke	50:26,55-50:29,80	1,88-1,67=0,21		
50 m butterfly	50:22,71-50:25,19	2,20-1,98=0,22		
100 m freestyle	100:47,64-100:52,79	2,10-1,89=0,21	0.205	
100 m backstroke	100:51,85-100:58,43	1,93-1,71=0,22		
100 m backstroke	100:58,51-100:1.05,97	1,71-1,51=0,20		
100 m butterfly	100:50,68-100:56,06	1,97-1,78=0,19		
200 m freestyle	200:1.44,22-200:1.55,46	1,92-1,73=0,19	0.172	
200 m backstroke	200:1,55,01-200:2.05,72	1,74-1,59=0,15		
200 m backstroke	200:2.07,94-200:2.22,88	1,56-1,40=0,16		
200 m butterfly	200:1.52,44-200:2.05,86	1,78-1,59=0,19		
200 m medley	200:1.55,71-200:2.08,20	1,73-1,56=0,17		0,17±0,17
400 m freestyle	400:3.42,46-400:3.59,21	1,80-1,67=0,13	0,135	t= 9,097,
400 m medley	400:4.06,10-400:4.33,57	1,63-1,46=0,17		p<0,05
800 m freestyle	800:7.39,68-800:8.15,27	1,74-1,62=0,12		1.53:9=0,17
1500 m freestyle	1500:14.35,31-1500:15.41,33	1,71-1,59=0,12		
4×100 m freestyle	400:3.10,36-400:3.31,89	2,10-1,88=0,22	0,203	
4×200 m freestyle	800:7.02,58-800:7.43,35	1,89-1,72=0,17		
4×100 m medley	400:3.28,87-400:3.54,34	1,92-1,70=0,22		
4×100 m freestyle mixed	200:1.34,90-200:1.44,80	2,10-1.90=0.20	0,11	
4×100 m medley mixed	200:1.49,66-200:1.50,88	1,82-1.80=0.02		
4×1500 m marathon mixed	6 km:64.42,2= a/s*1.54 m/s	1,54		
5000 m marathon	5 km:52.71,8-5 km:57.53,9	1,56-1,44=0,12	0,12	
10000 m marathon	10 km:110.75,4-10km:122.29,5	1,50-1,36=0,14		
25000 m marathon	25 km:302.26,5-25 km:324.15,2	1,38-1,28=0,10		

Notes: with an icon «a/s\*» the average swimming speed for a participant in the competition is indicated: 2 men+2 women  
The difference in the average speed of swimming: men,  $x \pm m = 1,84 \pm 0,18$ ; women,  $x \pm m = 1,67 \pm 0,16$ ;  $t = 9,097$ ,  $p < 0,05$

## Discussions

The results of other studies are similar to those reported in our study. According to Oppermann et. al. (2022), males are faster than females even in ice swimming, most likely due to a higher muscle mass and better strength as well as a taller stature, especially in sprint races. The same study reported that females can close the gap to males in cold water over longer distances because of the insulating effect and better buoyancy in the water of their generally higher body fat percentage. For example, success in sprint butterfly is predicated on anaerobic capacity determined by body composition, specifically muscle mass and net force production ability. As a result, men are likely to outperform women in such a short event requiring maximal force production (Carvalho et. al., 2020; Strzała et.al., 2017). However, women can outperform men in water colder than +20 °C during solo, long-distance swimming events (Knechtel et.al. 2020).

Over the years, more determinants of sports performance have been analyzed and training methods have improved. The results of our study highlight superior results and a greater number of medals for representatives of countries with financial potential that have invested in the development of swimmers' effort capacity, such as the USA, Australia, Italy and France. A recent study shows improving performance in men's freestyle 200 m results for the first three Olympic Games by –6.08% followed by a 0.51% worsening at Moscow 1980. Women improved their performance by 8.02% in the first four Olympics. Subsequent editions showed merely constant progression up to Beijing 2008, where the performance improvement was 0.73% for men and 1.97% for women. The subsequent Games of London 2012 suffered

the worst performances in men (+0.75%), which remained stable in women (-0.08%). In Rio 2016, both men and women improved their time by 1.05% and 0.98%, respectively, while in Tokyo 2020, men showed better improvement than women by 0.58% and 0.10%, respectively. For the 100 m and 200 m freestyle, both men and women overcame the predicted time for Tokyo 2020 by +1.8% and +2.0%, respectively (Demarie, Chirico & Galvani, 2022).

## Conclusions

The results of swimmers-winners at the XIX World Aquatics Championships, Budapest-2022, Hungary show that the most successful performance of athletes of the USA-45 medals, Australia-17, Italy-9 sports and +6 marathon swimming, Canada-11, France-8+2, Germany-4+5, China-5, Great Britain-5, Brazil-2+3 and Hungary-2+2 medals. The second ten teams included: Netherlands-2+2 medals, Japan-4, Sweden-4, Romania-2, Lithuania-2, Poland-2, Ukraine-1+1, South Korea-1, South Africa-1 medal. Therefore, the overall performance rating of the strongest swimmers in the world was an indicator of the awards received by swimmers-winners at the XIX World Championships. Among the male swimmers, the most successful were the athletes: USA-22 medals, Italy-6+4 marathon, Australia-6, France-5+1, Great Britain-5, Germany-3+2, Japan-4, Canada-3, Hungary-2+1, Brazil-2, Netherlands-2, Romania-2, Ukraine-1+1 marathon. Female swimmers also had following: USA-23 medals, Australia-11, Canada-8, China-5, Italy-3+2, France-3+1, Germany-1+3, Brazil-+3, Sweden-3, Lithuania-2, Netherlands-+2.

The dynamics of the formation of motor swimming skills according to the possibilities of overcoming different methods of swimming depending on the gender difference of the participants by age (men,  $x \pm m = 23.85 \pm 1.65$ ; women.,  $x \pm m = 22.64 \pm 2.23$ ;  $t = 0.039$ ,  $p > 0.05$ ) at the final starts of the XIX World Swimming Championships in 2022: the biggest difference was recorded in freestyle swimming for short and medium distances - 0.22 m/s, butterfly - 0.20 m/s, backstroke - 0.20 m/s and relay swimming - 0.20 m/s, breaststroke - 0.19 m/s, and then in medley swimming - 0.17 m/s, and the smallest difference was at the distances of stable swimming in freestyle - 0.12 m/s, in marathon swimming - 0.12 m/s and mixed relays - 0.11 m/s. Consequently, the difference in maximum and minimum difference in average swimming speed is, respectively:  $0.22 - 0.11 = 0.11$  m/s, and the total difference is over - 0.17 m/s (men,  $x \pm m = 1.84 \pm 0.18$ ; women,  $x \pm m = 1.67 \pm 0.16$ ;  $t = 9.097$ ,  $p < 0.05$ ).

The dynamics of the formation of motor swimming skills according to the possibilities of overcoming different swimming distances depending on the gender difference of the participants of the final races, by age (male,  $x \pm m = 23.85 \pm 1.65$ ; women.,  $x \pm m = 22.64 \pm 2.23$ ;  $t = 0.039$ ,  $p > 0.05$ ) at the XIX World Swimming Championships: the biggest difference was recorded at 50 m - 0.235 m/s, at 100 m - 0.205 m/s and relay swimming - 0.203 m/s, at 200 m - 0.172 m/s, at 400 m and distances of stable swimming - 800-1500 m - 0.135 m/s, and the slightest difference is observed in marathon swimming - 0.12 m/s and compatible relays - 0.11 m/s the difference between the maximum and minimum of the average swimming speed is:  $0.235 - 0.11 = 0.125$  m/s, and the overall difference in performance is more than - 0.17 m/s (men,  $x \pm m = 1.84 \pm 0.18$ ; women,  $x \pm m = 1.67 \pm 0.16$ ;  $t = 9.097$ ,  $p < 0.05$ );

The latest data obtained will make a significant informational contribution to the further improvement of the existing system of appropriate support for physical education and sports in a gender-based approach to the process of learning and improving young people. This will be needed to clarify the various possibilities for the proper performance of the strongest swimmers on the example of prestigious competitions, which are definitely indicators at the final races in swimming at all world championships for 1973-1999 at the first stage of their holding, as well as at the II stage of their holding for 2001-2022. It also details the trends of gradual long-term development of indicators of the formation of motor skills in sports and marathon swimming among young people of different ages and genders in these rather prestigious competitions from past times to the present challenges.

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