

**DETERMINATION OF MODEL CHARACTERISTICS OF TECHNICAL
AND TACTICAL INDICATORS OF HIGHLY QUALIFIED FEMALE
SWIMMERS, WHO SPECIALIZE ON THE DISTANCE OF 50 METERS BY
DIFFERENT STROKES**

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Purpose: to develop the model characteristics of technical and tactical indicators of highly qualified female swimmers, who specialize on the distance of 50 meters by different strokes.

Material and methods: analysis of literary sources, timing, video filming, methods of mathematical statistics. The surveyed contingent consisted of participants of the final heats of the Swimming Championships and Cups of Ukraine at the distance of 50 meters by different strokes. The level of sports qualifications of the sportswomen corresponded to the titles of Master of Sports of Ukraine and Master of Sports of Ukraine of international class.

Results: the influence of indicators of swimming speed, tempo and «step» of the cycle of rowing movements on the result of overcoming the distance of 50 meters by different strokes by highly qualified sportswomen investigated; the most significant parameters of the technical and tactical skill of highly qualified female swimmers depending on the swimming stroke determined and their model characteristics developed.

Conclusions: the influence of the indicators of swimming speed, tempo and «step» of the cycle of rowing movements on the result of overcoming the distance of 50 meters by highly qualified sportswomen has characteristic features depending on the swimming stroke. The most significant technical and tactical parameters in front crawl swimming is the speed on the segments «15 m - 25 m» and «45 m - 50 m», the tempo of the rowing movements on the sections «35 m - 45 m» (R is - 0,60, - 0,72 and - 0,72 respectively). In the backstroke swimming the result mainly depends on the fast swimming of the first 35 meters of the distance (R values are in the range of - 0,57 - 0,98), as well as the tempo values on the segment «25 m - 35 m» (R = -0,50). Efficiency at the distance of 50 meters by breaststroke swimming is influenced by the speed indicators of overcoming the sections «emerging - 15 m», «25 m - 35 m» and «45 m - 50 m», the tempo of rowing movements on the segments «emerging - 15 m» and «15 m - 25 m», the ability to maintain a large «step» on the sections «15 m - 25 m» and «25 m - 35 m» (R at the level of values - 0,88, - 0,56, - 0,86, - 0,55, - 0,70, - 0,79 and - 0,69 respectively). The result in the butterfly stroke mostly depends on the fast passage the underwater area and the second half of the distance of 50 meters (R within 0,58 – 0,86). The tempo and «step» of the cycle of rowing movements closely correlate with the final result on the second half of the competitive distance (R values vary from – 0,70 to – 0,97). Orientation on the developed model characteristics of the most significant indicators of technical and tactical skill of highly qualified female athletes, who have the different swimming specializations, will contribute to the improvement of training and competitive activity in modern swimming.

Keywords: sportswomen, 50 meters, swimming strokes, technical and tactical indicators, correlation, model characteristics.

Introduction

The level of development of modern swimming, what is characterized by the demonstration of high results, expanding the arsenal of distances at which athletes perform, dictates the need to find the ways to improve the training and competitive

activities [1; 7].

A significant role in this direction is given to the analysis of competitive activities of highly qualified athletes, the study of a wide range of issues that relate to its individualization and optimization. [3; 6].

To date, thanks to numerous scientific achievements, the main components of the structure of competitive activities were identified, the degree of connection between them and various parameters of the structure of special preparedness of swimmers was determined, etc [2; 9].

The parameters of technical and tactical skills of sportswomen, which are a kind of reflection of the ability to realize the results of the conducted work in conditions of the competition, are of particular interest among the studied indicators [5; 8; 11; 12].

However, it should be noted that the attention of experts is mainly focused on studying the features of technical and tactical actions of female athletes during swimming the competitive distances by front crawl, while the nuances of overcoming distances by other sports strokes remain incompletely considered [4; 10].

In the modern literature there are not enough the works which relate to the comparative analysis of the parameters of technical and tactical skills of swimmers during overcoming the distances of different lengths, taking into account age, stroke of swimming, level of sports skills, determining their model characteristics.

Carrying out of researches in this direction will allow to reasonable approach to differentiation of preparation of sportswomen of various swimming specializations that in turn will promote improvement of quality of their training process, will increase the efficiency of performance at competitions.

Purpose of the work - to develop the model characteristics of technical and tactical indicators of highly qualified female swimmers who specialize at the distance of 50 meters by different strokes.

Objectives of the study:

1. To study the influence of speed, tempo and «step» of the cycle of rowing movements on the result of overcoming by highly qualified sportswomen the distance

of 50 meters by different strokes.

2. To determine the most important parameters of technical and tactical skills of highly qualified female swimmers depending on the stroke of swimming.

3. To develop the model characteristics of technical and tactical indicators of highly qualified sportswomen during swimming the most important sections of the distance of 50 meters by different strokes.

Material and Methods of research

The following methods were used to solve the described tasks: analysis of literature sources, timing, video recording, methods of mathematical statistics.

The surveyed contingent consisted of participants of the final heats of the Ukrainian Swimming Championships and Cups at the distance of 50 meters by front crawl, backstroke, breaststroke and butterfly. The level of sports qualification of sportswomen corresponded to the titles of Master of Sport of Ukraine and Master of Sport of Ukraine of international class.

Results of the research

For develop of the model characteristics of technical and tactical indicators of highly skilled female swimmers who specialize at the distance of 50 meters by different strokes, we investigated the degree of correlation between the parameters of speed, tempo and «step» of the cycle of rowing movements and the end result of swimming this competitive distance by front crawl, backstroke, breaststroke and butterfly.

The conducted analysis of the obtained data allowed to determine that the parameters of speed on the segments «15 m – 25 m» and «45 m – 50 m» are the most important for achieving high results at the distance of 50 meters by the front crawl swimming (R is equal to - 0,60 and - 0,72 respectively) (Figure 1 a).

The tempo of rowing movements on the segment «35 m – 45 m» has the close correlation with the result ($R = - 0,72$) (fig. 1 b).

The parameter of the «step» of the cycle of rowing movements on the section «15 m – 25 m» significantly affects the final result ($R = -0,50$) (Figure 1 c).

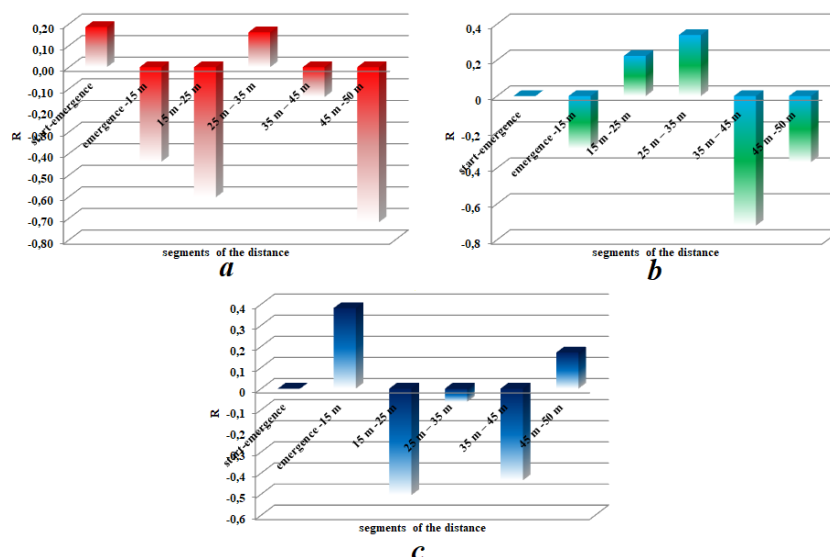


Fig. 1 The influence of technical and tactical indicators of highly qualified sportswomen during overcoming different sections of the distance of 50 meters by front crawl on the final result: a – speed, b – tempo, c – «step» of the cycle of rowing movements

The result in the backstroke swimming largely depends on the fast overcoming the first 35 meters of the distance (R values vary within - 0, 57 – - 0, 98) (Figure 2 a).

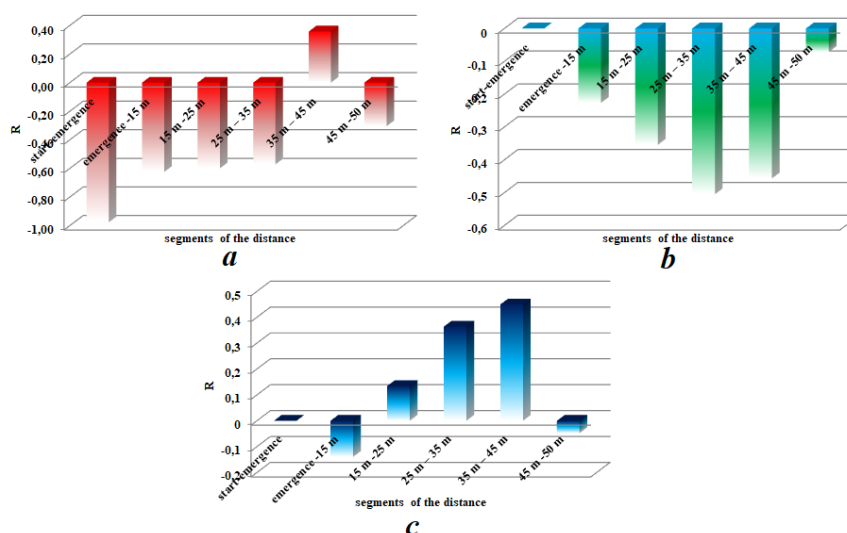


Fig. 2 The influence of technical and tactical indicators of highly qualified sportswomen during overcoming different sections of the distance of 50 meters by backstroke on the final result: a – speed, b – tempo, c – «step» of the cycle of rowing movements

Moreover, as the distance passes, the influence of speed parameters is steadily decreasing. Therefore, sportswomen should be ahead of competitors on the first half of the distance, especially during overcoming the segment «start- emergence».

The tempo on the segment «25 m – 35 m» of the backstroke swimmers is significant among other technical and tactical indicators ($R = - 0,50$) (Figure 2 b).

In turn, the «step» of the cycle of rowing movements by backstroke swimming on the shortest competitive distance by this stroke is insignificant in degree of importance (Figure 2 c).

The performance at the distance of 50 meters by breaststroke swimming depends on the speed of overcoming by female athletes the sections «emergence – 15 m», «25 m – 35 m» and «45 m – 50 m» (R is equal to $- 0,88$, $- 0,56$ and $- 0,86$ respectively) (Figure 3 a).

The tempo of rowing movements, which highly qualified breaststroke swimmers demonstrate on the segments «emergence – 15 m» and «15 m – 25 m», has a significant impact on the result (R is at the level of values $- 0,55$ and $- 0,70$ respectively) (Figure 3 b).

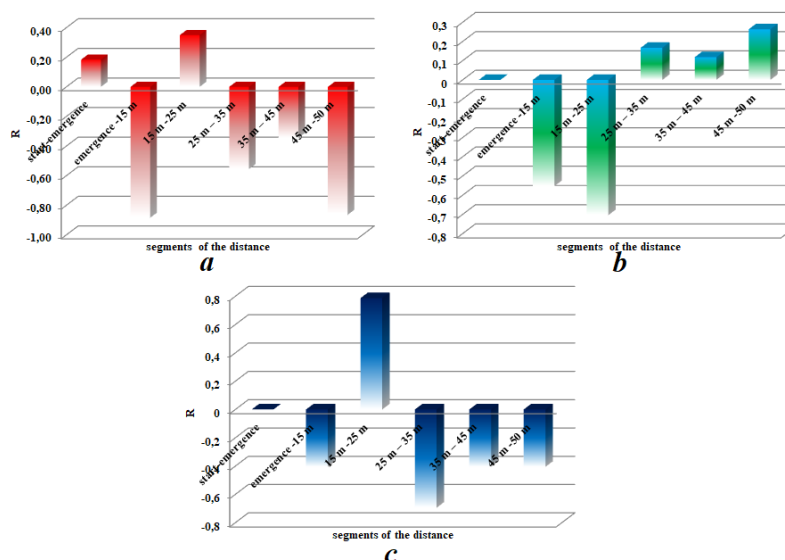


Fig. 3 The influence of technical and tactical indicators of highly qualified sportswomen during overcoming different sections of the distance of 50 meters by breaststroke on the final result: a – speed, b – tempo, c – «step» of the cycle of rowing movements

The ability of sportswomen to maintain a large «step» on the sections of distance swimming, namely within the limits «15 m – 25 m» and «25 m – 35 m» has the great importance. The values of the correlation coefficient reach the values of 0,79 and - 0,69 (Figure 3 c).

The result in the butterfly swimming is due to the speed of overcoming the underwater area and the second half of the competitive distance of 50 meters (R is equal to 0,58 - 0,86) (Figure 4 a).

The ability of the sportswoman to maintain a stable indicators of tempo of rowing movements on the second half of the distance plays a significant role in this most difficult in terms of strength and functional preparedness stroke of swimming. The influence of tempo indicators on the result increases when approaching to the finish line. The value of R enlarges from - 0,70 to - 0,97 (Figure 4 b).

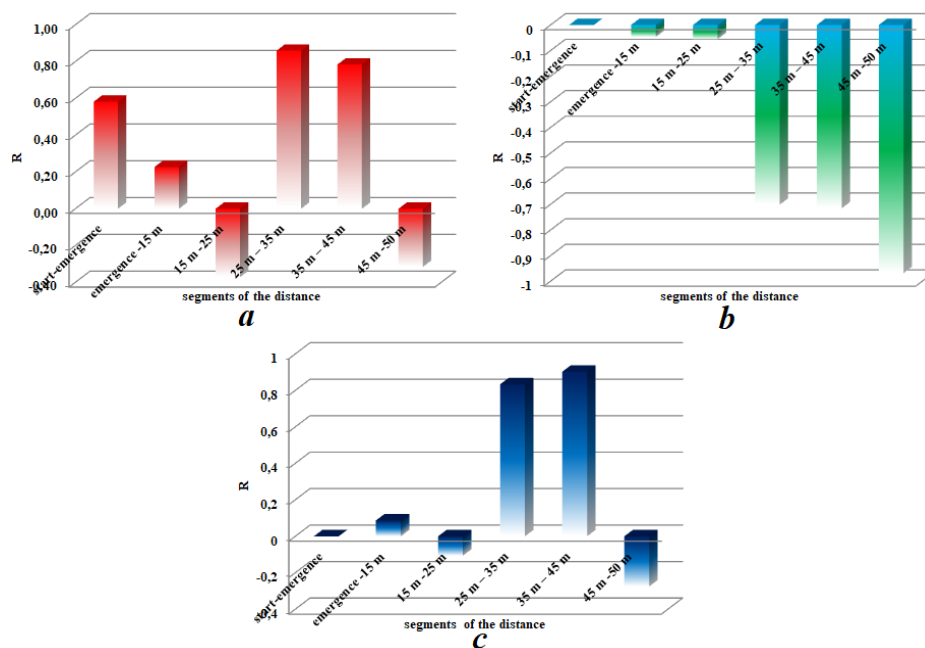


Fig. 4 The influence of technical and tactical indicators of highly qualified sportswomen during overcoming different sections of the distance of 50 meters by butterfly on the final result: a – speed, b – tempo, c – «step» of the cycle of rowing movements

The «step» of the cycle of rowing movements, as well as the tempo, has a close correlation with the result on the second half of the distance of 50 meters (R is at the

level of values 0,83 and 0,90 respectively) (Figure 4 c).

Thus, it can be argued that the overcoming by female swimmers of high class the second half of the distance of 50 meters by butterfly stroke at high speeds while maintaining high indicators of tempo of movements and length of rowing will allow to demonstrate the good results and succeed in competitions.

Based on the identified correlations, we developed the model values of the most important indicators of technical and tactical skills of highly qualified sportswomen who successfully overcome the distance of 50 meters by different swimming stroke (Table 1).

Table 1

Model characteristics of indicators of technical and tactical skills of highly qualified sportswomen in process of overcoming the most important sections of the competitive distance of 50 meters by different strokes of swimming

№	The sections of the competitive distance	The model values of indicators of technical and tactical skills		
		Speed	Tempo	«Step»
Front crawl				
1.	15 m – 25 m	1,90±0,23	58,98±7,61	1,80±0,14
2.	35 m - 45 m	1,75±0,11	56,07±10,40	1,90±0,18
3.	45 m -50 m	1,62±0,26	63,60±10,27	1,70±8,11
Backstroke				
4.	start- emergence	2,06±0,13	-	-
5.	emergence -15 m	1,65±0,07	49,38±3,95	2,01±0,15
6.	15 m - 25 m	1,57±0,06	49,20±4,96	1,94±0,19
7.	25 m - 35 m	1,67±0,06	49,47±6,35	2,05±0,23
Breastroke				
8.	emergence -15 m	2,04±0,37	64,26±12,48	1,92±0,20
9.	15 m - 25 m	1,46±0,08	61,32±7,04	1,43±0,17
10.	25 m - 35 m	1,58±0,12	60,85±7,26	1,56±0,14
11.	45 m - 50 m	1,24±0,02	59,82±7,42	1,28±0,13
Butterfly				
12.	start - emergence	1,96±0,22	-	-
13.	25 m - 35 m	1,84±0,20	59,92±4,06	1,86±0,34
14.	35 m - 45 m	1,81±0,12	57,54±6,87	1,91±0,33
15.	45 m - 50 m	1,10±0,51	51,47±4,76	1,25±0,39

The developed model characteristics can be used as guidelines for improving the training and competitive activities of highly qualified sportswomen of various swimming specializations.

Conclusions / Discussion

The obtained results agree with the statement of many authors that the indicators of technical and tactical skills significantly affect the result of overcoming the distance of 50 meters regardless of the stroke of swimming.

It is determined that parameters of the speed on the segments «15 m – 25 m» and «45 m – 50 m» and the tempo of rowing movements on the section «35 m – 45 m» have the greatest impact on the result of overcoming the sprint distance of 50 meters by front crawl (R at the level of values - 0,60, - 0,72 and - 0,72 respectively).

It was found that in the backstroke the result depends more on the fast swimming of the first 35 meters of the competition distance (R is within - 0,57 – - 0,98) and the indicators of frequency of movements on the segment «25 m - 35 m» (R=-0,50).

It is proved that the effectiveness at the distance of 50 meters during swimming by breaststroke depends on the speed of overcoming the segments «emergence – 15 m», «25 m – 35 m» and «45 m – 50 m», (R is equal to - 0,88, - 0,56 and - 0,86 respectively), the tempo on the section «emergence – 15 m» and «15 m – 25 m» (the value of the correlation coefficient reaches - 0,55 and - 0,70 respectively), the ability to maintain a significant length of the rowing in the range of 15 - 35 meters (R is on levels of values - 0, 69 – 0,79).

It was found that the result in the butterfly swimming is determined by the speed of the overcoming by sportswomen the underwater area and the second half of the competition distance of 50 meters (R in the range of 0,58 - 0,86). The tempo and the «step» of the cycle of rowing movements have a close correlation with the final result on the second half of the distance (R is in the range from - 0,70 to - 0,97).

The orientation on the developed model characteristics of the most important technical and tactical indicators of highly qualified sportswomen of various swimming specializations will contribute to the improvement of training and competitive activities in modern swimming.

The prospect of further research is to determine the features of technical and tactical actions of sportswomen of different specializations during swimming

distances of 100 and 200 meters.

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References

1. Hryshyn, V. A. (2002), Differentiation of the training process of qualified swimmers depending on the specialization: Summary of candidate of pedagogical sciences dissertation. Moscow, 19 p. (in Russ.)
2. Kleshnev, V. V. (2001), "Speed, pace and step in swimming", Swimming IV, St. Petersburg, pp. 33 - 36. (in Russ.)
3. Matveev, L. P. (1996), Sorevnovatelnaia deiatelnost sportsmena y systema sportyvnykh sorevnovanyi : ucheb. posobyе, [Competitive activity of the athlete and the system of sports competitions: textbook manual], Moscow, 79 p. (in Russ.)
4. Pylypko, O. A. (2014), "Modeling the profile of highly qualified athletes who specialize in swimming by the crawl stroke", Naukovyi zhurnal «Science Rise», Kharkov, № 3/1 (3), pp. 78 - 86. (in Russ.)
5. Pylypko, O. O. (2018), "Modeling of indicators in technical and tactical majesty of highly qualified athletes, who specialize in swimming with a butterfly stroke at a distance of 50 meters", Visnyk Chernihivskoho natsionalnoho pedahohichnoho universytetu, Chernigiv, Issue 152, Vol. 1, Ser: Pedahohichni nauky, pp. 205 - 208. (in Ukr.)
6. Platonov, V. N. (2012), Sportivnoe plavanie: put k uspekhu: v 2 kn. [Sports swimming: the path to success: in two books], Kiev, B.1, 480 p. (in Russ.)
7. Platonov, V. N. (2012), Sportivnoe plavanie: put k uspekhu: v 2 kn. [Sports swimming: the path to success: in two books], Kiev, B.2, 544 p. (in Russ.)
8. Podosynova, L. P., Evpak, N. A. (2015), "Improving the technical preparedness of qualified swimmers based on the compilation of model characteristics", Physical culture, sports and health, Kyiv: NUPhESU, pp. 85 – 87. (in Russ.)

9. Blanksby, B., Nicholson, L., Elliott, B. (2001), "Biomechanical analysis of the grab, track and handle swimming starts: an intervention study", Sport biomechanics, V. 1, № 1, pp. 11 — 24. (in Eng.)
10. Pilipko, O. (2019), "Features of technical and tactical actions of highly skilled athletes when swimming a distance of 100 meters by front crawl", Slobozhanskyi herald of science and sport, Kharkiv, No 2 (70), pp. 31 - 36. (in Eng.)
11. Haljand, R. (1999), "Technical and tactical parameters of competition performances", Competition analysis in European Swimming Championships, Moscow, pp. 1 — 7. (in Eng.)
12. Wilke, K. (1997), Anfänger Schwimmen: training-technik-taktik, Rowohlt, 185 p. (in Eng.)

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