

Features of technical and tactical actions of female athletes of various qualifications specializing in complex swimming at a distance of 200 meters

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Purpose: determine the features of technical and tactical actions of female athletes of various qualifications specializing in complex swimming at a distance of 200 meters.

Material & Methods: analysis of literary sources, video shooting, timing, methods of mathematical data processing. The contingent of the surveyed were female athletes who specialized in complex swimming at a distance of 200 meters and had the level of sports qualification of the CMS, I and II adult category.

Results: author established that the technical and tactical actions of female athletes of various skills during the crossing of the 200 meters distance by complex swimming have their own peculiarities; the degree of influence of the speed, pace and "step" indicators of the cycle of strokes on the result of the swimming of a distance of 200 meters in female athletes with a qualification level of CMS, I and II adults.

Conclusion: determination of the specifics of the technical and tactical actions of female athletes of various qualifications specializing in complex swimming at a distance of 200 meters can serve as a guide for the construction of the training process, which will allow it to be improved in order to achieve high results.

Keywords: complex swimming, 200 meters, athletes, skill level, technical and tactical actions, relationship.

Introduction

The current level of development of swimming dictates the need to search for the most promising ways to improve the training system, which ensure that athletes achieve high results in competitions of the highest rank [1, 6; 9; 12].

Among a wide range of different directions reflecting the concept of training high-class swimmers, an important role is played by the analysis of competitive activities [3; 4; 7; 8; 10].

Despite the fact that a lot of research has been done in this direction, a number of aspects remain fully studied. In particular, in the modern literature there is not enough research related to the analysis of technical and tactical actions of athletes in the process of overcoming them by a distance of 200 meters by complex swimming [2; 5; 11]. While the structure of the competitive activities of those who specialize in this type of program, has a pronounced specificity.

Conducting relevant studies related to the study of the features of the passage of this competitive distance, the determination of the relationship between the indicators of technical and tactical skill and the result of athletes of different ages, gender, and skill level opens new prospects for the growth of achievements in the national complex swimming.

Relationship of research with scientific programs, plans, themes. The research was carried out in accordance with the initiative theme of the Department of Water Sports of KhSAPC "Modeling of competitive activities in modern sports swimming".

Purpose of the study: determine the features of technical and tactical actions of athletes of various qualifications spe-

cializing in integrated swimming at a distance of 200 meters.

Objectives of the study:

1. To characterize the dynamics of the speed, pace and "step" of the cycle of strokes in athletes of various skills in the process of overcoming the distance of 200 meters by complex swimming.
2. To determine the degree of interrelation between the indicators of technical and tactical skill and the sporting result at a distance of 200 meters by complex swimming for athletes with the qualification level of the CMS, I and II senior category.
3. Identify areas of the competitive distance, in which the impact of technical and tactical parameters on the result in swimmers of different levels of sportsmanship is significantly different.

Material and Methods of the research

To solve the set tasks, the following methods were used in the work: analysis of literary sources, video shooting, timing, methods of mathematical processing of numerous data.

The collection of experimental data was carried out at the Championships and Ukrainian Swimming Cups during 2015–2017.

The surveyed group consisted of participants in the final swim at a distance of 200 meters in complex swimming. All female athletes had a level of sports qualification of the CMS, I and II senior category.

Results of the research and their discussion

Assessment of technical and tactical actions of female athletes specializing in integrated swimming at a distance of 200

meters was carried out according to the speed, pace and "step" of the cycle of strokes, which were recorded at the starting, finishing, turning segments, and remote swimming areas.

The analysis of the obtained digital material made it possible to determine the features of the technical and tactical actions of swimmers of different qualifications when they overcome a distance of 200 meters (Figures 1–9).

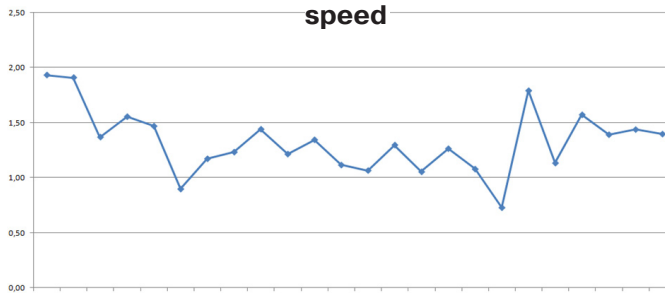


Figure 1. Dynamics of speed indicators for female athletes CMS qualified, in the process of overcoming the 200 meters distance by complex swimming

As can be seen from Figure 1, in athletes qualified to the CMS, when swimming the 200-meter distance, there are significant fluctuations in the speed parameters. They are particularly noticeable at the first and last 50 meters.

The highest speed was recorded on the segment "start-broach" ($1,93 \text{ m}\cdot\text{s}^{-1}$) and in the "turn-broach" section during the swimming by the breaststroke method to the way the front crawl ($1,79 \text{ m}\cdot\text{s}^{-1}$).

After a rapid decrease in the speed of advance on the first 50 meters, which occurs before the moment of contact of the turntable, the next two segments (in the way back crawl and breaststroke) pass relatively evenly.

At the final quarter of the distance there is an increase in speed indicators due to the performance of a powerful repulsion from the turntable with subsequent stabilization to the finish mark.

Throughout the competition distance, athletes attempt to maintain relatively stable tempo indicators (Figure 2).

At the same time, the first 50 meters are overcome with a gradual decrease (from $59,8$ to $46,0 \text{ cycles}\cdot\text{min}^{-1}$).

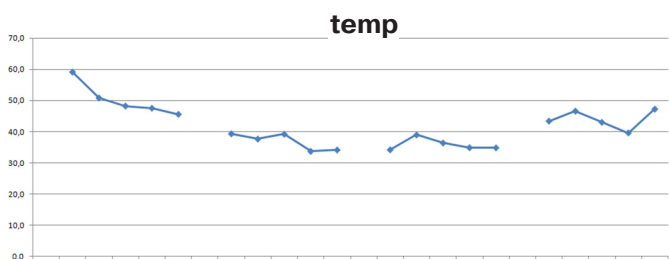


Figure 2. Dynamics of indicators of the tempo of stroke movements for female athletes CMS qualified, in the process of overcoming the 200 meters distance by complex swimming

The most significant slowing of the frequency of movements occurs in the section "85-95 m" when the passage is cut by the way back crawl (from $39,5$ to $33,8 \text{ cycles}\cdot\text{min}^{-1}$).

When swimming by the breaststroke method after the turn, the tempo indicators increase and reach a value of $39,0 \text{ cycles}\cdot\text{min}^{-1}$. In the future, its relative stabilization proceeds.

At the last 50 meters of the distance, the frequency of swimming movements increases significantly, reaching $46,6$ and $47,3 \text{ cycles}\cdot\text{min}^{-1}$, respectively, on the sections "broach-165 m" and "195-200 m".

Significant fluctuations in the "step" indicators of the cycle of strokes are traced in each 50-meter section of the competitive distance of 200 meters (Figure 3). And in the ways of swimming butterfly and breaststroke, the oscillations of this parameter are generally similar. Just like when swimming in a way the crawl on the chest and back.

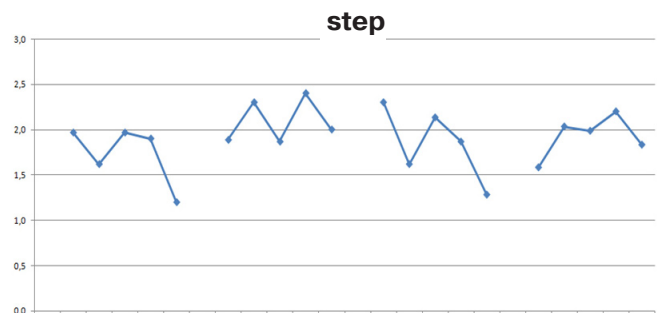


Figure 3. Dynamics of indicators of the "step" of stroke movements for female athletes CMS qualified, in the process of overcoming the 200 meters distance by complex swimming

The smallest values of the "step" of the cycle of strokes are fixed on the section "45-50 m" ($1,2 \text{ m}$) and "145-150 m" ($1,3 \text{ m}$). The largest values take place on the segments "75-85 m" ($2,4 \text{ m}$) and "65-75 m" ($2,3 \text{ m}$).

In female athletes of the 1st category, a distance of 200 meters by complex swimming is overcome with significant wave-like velocity variations (Figure 4).

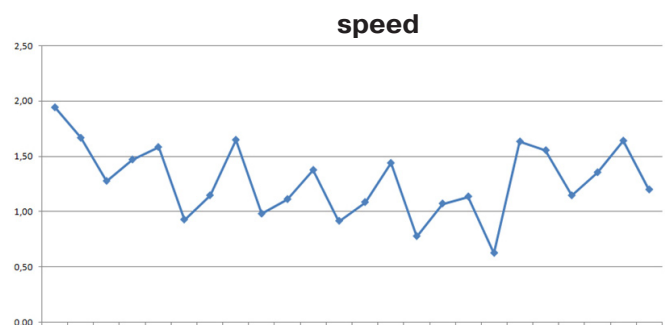


Figure 4. Dynamics of speed indicators for female athletes 1 senior category, in the process of overcoming the 200 meters distance by complex swimming

The most powerful swimmers pass the section "broach-15 m" ($1,94 \text{ m}\cdot\text{s}^{-1}$), the slowest part is the "145-150 m" section ($0,63 \text{ m}\cdot\text{s}^{-1}$).

In general, the first 150 meters of the race distance is flush with the general tendency to decrease the speed indicators.

When swimming in the way the crawl on the chest the segments "turn-broach" and "165-195 m" there is a noticeable increase in the speed of advance (up to $1,63 \text{ m}\cdot\text{s}^{-1}$ and $1,64 \text{ m}\cdot\text{s}^{-1}$, respectively). At the finish line, traffic slows to $1,20 \text{ m}\cdot\text{s}^{-1}$.

The analysis of the tempo values allows us to state that when the distance is traveled by the butterfly method after the frequency of movement decreases at the first 25 meters, the athletes have an increase in the tempo (from $44,5$ to $49,2 \text{ cycles}\cdot\text{min}^{-1}$) (Figure 5).

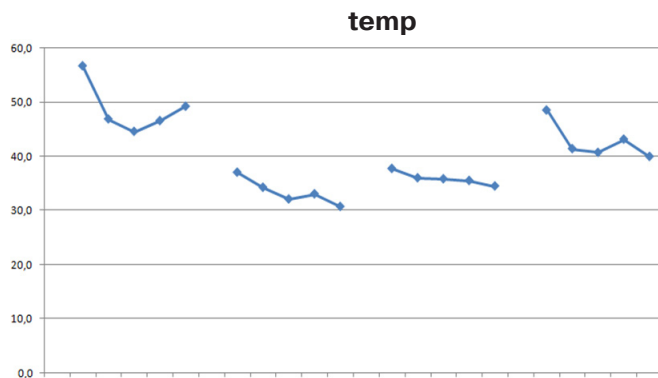


Figure 5. Dynamics of indicators of the tempo of stroke movements for female athletes 1 senior category, in the process of overcoming the 200 meters distance by complex swimming

On the second and third 50 meters, which are overcome by the methods of crawl on the back and breaststroke, there is a moderate decrease in the frequency of movements.

On the last stretch of the distance (when swimming in the way of a crawl on the chest), there is a rapid decrease in the tempo $48,5$ to $38,9 \text{ cycles}\cdot\text{min}^{-1}$.

Essential fluctuations of the "step" of the cycle of strokes in athletes of the 1 category are traced in each 50-meter section of the race distance (Figure 6).

In general, the dynamics of the "step" values of the cycle of strokes have a wave-like tendency.

The smallest values of the length of the stroke are fixed on the

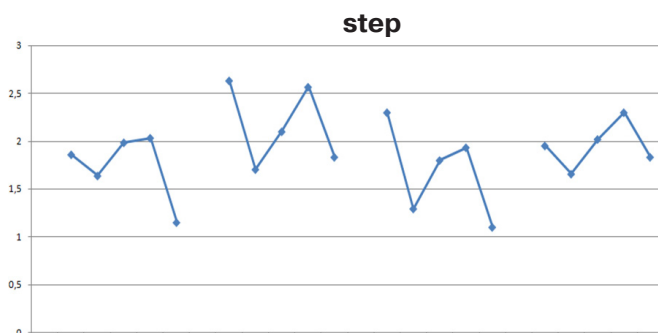


Figure 6. Dynamics of indicators of the "step" of stroke movements for female athletes 1 senior category, in the process of overcoming the 200 meters distance by complex swimming

sections "45-50 meters" and "145-150 meters" ($1,2 \text{ m}$ and $1,1 \text{ m}$, respectively). The greatest values of the "step" of the athletes are demonstrated in the method of the rabbit on the back ($2,6 \text{ m}$).

In the swimmers of the II category, a gradual wave-like decrease in the speed of advance with a noticeable increase in its speed is observed throughout the entire 200-meter distance, when passing from the method of swimming to the breast-way method (from $0,58$ to $1,64 \text{ m}\cdot\text{s}^{-1}$) (Fig. 7).

When swimming to the turntable, speed indicators in athletes are significantly reduced. Their values on these sections vary from $0,58$ to $1,10 \text{ m}\cdot\text{s}^{-1}$.

The swimmings of the section of the swimmer's distance pass with significant acceleration due to powerful repulsion from the pool wall.

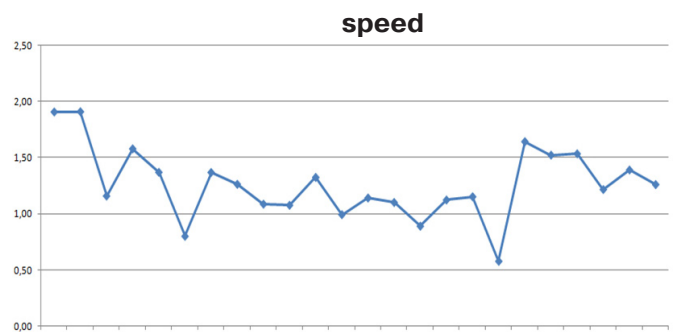


Figure 7. Dynamics of speed indicators for female athletes 2 senior category, in the process of overcoming the 200 meters distance by complex swimming

During the overcoming of the competitive distance, the athletes try to keep the constant tempo of the strokes (Figure 8).

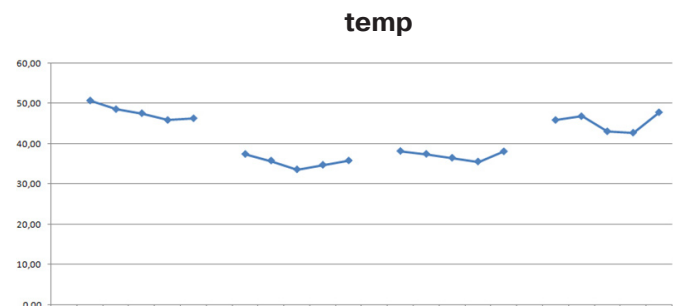


Figure 8. Dynamics of indicators of the tempo of stroke movements for female athletes 2 senior category, in the process of overcoming the 200 meters distance by complex swimming

At the first 50 meters, the average tempo is $47,84 \text{ cycles}\cdot\text{min}^{-1}$, in the second 50-meter section the indicator is equal to $35,48 \text{ cycles}\cdot\text{min}^{-1}$, the third segment is elongated at an average rate of $37,16 \text{ cycles}\cdot\text{min}^{-1}$, at the last 50 meters the frequency of movements increases to the level of $45,29 \text{ cycles}\cdot\text{min}^{-1}$.

Changes in the magnitude of the "step" of the cycle of strokes occur wave-like (Figure 9).

When they overcome the distances of the competitive distance by the ways of butterfly and breaststroke, the fluctua-

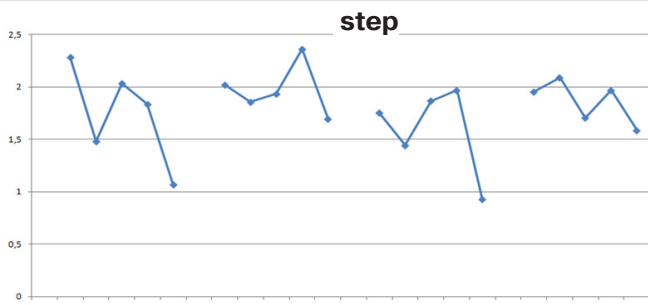


Figure 9. Dynamics of indicators of the "step" of stroke movements for female athletes 2 senior category, in the process of overcoming the 200 meters distance by complex swimming

tions in the indices are similar: after the absolute values decrease at the first 15-25 meters, their growth occurs with a gradual decline at the paddleplant to the turntable.

The greatest value of the length of the stroke in athletes takes place when the segment is overcome by the method of crotch on the back (2,3 m).

Swimming the last 50 meters of the competitive distance is characterized by fluctuations in the values of the "step" of the cycle of strokes with a noticeable decrease in the finish interval (from 2,1 m to 1,6 m).

Thus, the results obtained make it possible to assert that the level of sports qualification leaves an imprint on the features of technical and tactical actions of female athletes in the process of overcoming a competitive distance of 200 meters by complex swimming.

The conducted correlation analysis made it possible to determine the indices of technical and tactical skill, which significantly affect the result of the swimming of a distance of 200 meters for athletes of different skill levels.

So, in swimming – candidates for the master of sports significant for demonstration of high results on a distance of 200 meters are: speed on segments "35-45 m", "broach-65 m", "65-75 m", "115-125 m", "135-145 m", "175-185 m", the tempo on the section "15-25 m", "step" of the cycle of strokes on the segments "15-25 m", "65-75 m", "165-175 m" (the values of R are in the range of 0,8-0,91).

Among the indicators of technical and tactical skill in girls with a level of sports qualification I category closely correlate with the sports result in the integrated swimming at a distance of 200 meters such parameters as: speed on the sections "15-25 m", "65-75 m", "115-125 m", "165-175 m", the tempo on the segments "65-75 m", "75-85 m", "185-195 m", "step" of the cycle of strokes on the sections "15-25 m", "65-75 m" and "165-175 m" (the value of R is equated respectively 0,90, 0,91, 0,85, 0,82, 0,91, 0,91, 0,85, 0,90, 0,81, 0,92).

In athletes of the 2 category, the result at a distance of 200 meters is under considerable influence of the speed parameters on the sections "15-25 m", "35-45 m", "145-150 m", "195-200 m", the tempo on the sections "35-45 m", "65-75 m", "step" of the cycle of strokes on the segments "95-100 m", "145-150 m" and "195-200 m" (the value of R is equated 0,90, 0,91, 0,81, 0,71, 0,60, 0,60, 0,91, 0,71 и 0,92 respec-

tively).

In the course of the comparative analysis it was revealed that the speed index on the section "15-25 m" is significant for both the athletes of the 1st and 2nd category.

Speed on the segments "65-75 m" and "115-125 m" plays a big role in order to achieve a high final result in the female athletes qualifying CMS and I category.

The parameters of the "step" of the cycle of strokes on the sections "15-25 m", "65-75 m" and "165-175 m" are equally important for athletes who have the qualification level of the CMS and the 1 category, and the rate of the warming segment "65-75 m" has a close category of correlation relationship with the athletic result of athletes 1 and 2 category.

Biggest difference in the significance for achieving high results at a distance of 200 meters with complex swimming, depending on the level of sports qualification, is noted in the speed indicators on the sections "broach-65 m", "broach-165 m", the last 50 meters; tempo on the segments "25-35 m", "broach-165 m", "185-195 m"; "Step" of the cycle of strokes on the sections "65-75 m", "115-125 m" and "165-175 m".

The results of the analysis of the technical and tactical actions of athletes of various qualifications specializing in integrated swimming at a distance of 200 meters can be used in the construction of the training process, which will allow it to differentiate with the aim of achieving high results.

Conclusions

1. The level of sports qualification leaves an imprint on the features of technical and tactical actions of female athletes in the process of overcoming the competitive distance of 200 meters by complex swimming.
2. Swimming of the 200-meter distance in the qualification of the athlete is characterized by significant fluctuations in the speed and "step" of the cycle of strokes, the content of stable pace indicators.
3. Athletes qualifying for the I category, overcome the distance of 200 meters by complex swimming with significant changes in the indicators of technical and tactical skill.
4. Peculiarities of swimming 200 meters distance by female athletes of the II category is a gradual decrease in speed, constant tempo, wavy oscillation of the "step" of the cycle of strokes with a noticeable contraction at the finish line.
5. The degree of interconnection between the indicators of technical and tactical skill and the result at a distance of 200 meters with complex swimming depends on the level of qualification of athletes.
6. Parameters of technical and tactical actions, which significantly affect the outcome of swimming the distance of 200 meters with integrated swimming, predominantly coincide with athletes of the level of qualification of the CMS and I-th category.
7. Determination of the features of technical and tactical actions of athletes of various qualifications specializing in inte-

grated swimming at a distance of 200 meters can serve as a reference for the construction of the training process, which will improve it in order to achieve high results.

The prospect of further research is to study the features

of technical and tactical actions of athletes of various qualifications specializing in complex swimming at a distance of 400 meters.

Conflict of interests. The author declares that no conflict of interest.

Financing sources. This article didn't get the financial support from the state, public or commercial organization.

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Received: 15.01.2018.

Published: 28.02.2018.

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