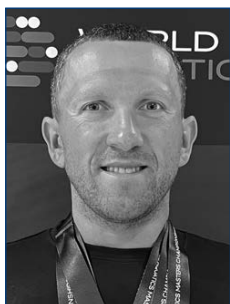


Improving the athletic training of open water swimmers: the role of multicomponent training

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E.I. Mannanov¹

A.I. Mannanov²

¹Water Sports Club, Las Palmas, Spain

²Swimming school MannanovSwim, Moscow

Corresponding author: swim-sochi@mail.ru

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Abstract

Objective of the study was to evaluation of the effect of multifaceted variations in training regimens on enhancing the physical and tactical abilities of swimmers in open water.

Methods and structure of the study. The research is grounded on the assumption that training with programs that consider multi-faceted environmental alterations, particularly incorporating open water training, can substantially enhance the physical endurance, tactical abilities, and psychological resilience of swimmers.

In this investigation, the performance of two groups of swimmers was assessed: the first group adhered to the conventional program in the pool, while the second group incorporated open water sessions with various exercises. A total of 40 swimmers, with diverse levels of training and expertise in open water swimming, participated in the experiment.

Results and conclusions. The study's outcomes support the theory that incorporating training in open water enhances the abilities of swimmers. These results can be applied to create novel training methods designed to maximize the training of swimmers in open water environments.

Keywords: open water swimming, adaptive training, multi-component variability, athletic performance, tactical skills, psychological resilience, drafting.

Introduction. Open water swimming requires athletes to be highly trained and able to adapt to constantly changing environmental conditions. Unlike pool swimming, where conditions are static, open water presents many additional challenges, such as changing temperatures, waves, and currents. In a pool, athletes have the ability to control their speed using visible cues such as the bottom, tiles, lanes, and ropes. In open water, such cues are generally absent, making it difficult to estimate speed and requiring additional training to maintain it. Despite the importance of these factors, the impact of multi-component variability in training routes on swimmers' performance has not received sufficient attention in the scientific literature. Pool training, although beneficial for developing technique and strength, cannot fully simulate open water conditions. Open water places special demands on swimmers, such as adapting to varying temperatures, waves, and currents, which significantly affect swimming technique and tactics. In addition, the lack

of visual reference points in open water makes speed control and navigation more difficult, which requires additional skills and training from athletes.

Today, marathon swimmers neglect new methods, especially in Russia, and continue to train only in pools, limiting themselves to traditional training methods.

Thus, the scientific novelty of this study lies in determining the methodological potential of open water training for its subsequent inclusion in marathon swimmers' training programs.

Objective of the study was to evaluation of the effect of multifaceted variations in training regimens on enhancing the physical and tactical abilities of swimmers in open water.

Literature review. Training in different water bodies, such as seas, lakes and rivers, helps to improve the adaptive abilities of swimmers. Foreign researchers, such as Finlay and Knechtle, note an important indicator: swimming in salt water with waves requires different techniques and efforts compared to swimming in freshwater lakes [6, 7].



Water temperature and the nature of the current can significantly affect the physical parameters of swimmers. Macaluso notes that training in conditions of different temperatures and currents helps swimmers better prepare for extreme conditions, reducing the risk of hypothermia or overheating and improving thermoregulation [8].

Comparative studies (Knechtle et al., 2010; Finlay et al., 1995) show that swimmers who use a variety of training routes demonstrate better results compared to those who train on monotonous routes [6, 9]. During such training, swimmers can master the basics of proper drafting, which will save energy and increase swimming speed, as well as quickly and efficiently take turns.

Training in changing conditions helps swimmers develop stress resistance and confidence [1]. Bradford notes that constant changes in the training environment can reduce anxiety before competitions and improve the ability of swimmers to maintain concentration in stressful situations [3].

Valkoumas I, Gourgoulis V, Aggeloussis N, Antoniou P. and other authors, based on experimental studies, prove that resistance swimming programs improve the continuity of movement and can be considered an effective form of training, increasing the stroke frequency and, consequently, swimming speed [10]. A study by British authors (C.D. Bradford, S.J. E. Lucas, D.F. Gerrard, J.D. Cotter.) is devoted to the extent to which swimming in warm water (temperature 33°C) helps swimmers adapt to heat conditions and improves their physical performance. The study showed that swimming in warm water is ineffective in improving physical performance and adapting to heat conditions [4].

The scientific literature shows that open water swimming has its own characteristics: Gregory Shaw 1, Anu Koivisto, David Gerrard, Louise M Burke point out that "different locations have changing environmental conditions, including water and ambient temperature, humidity, solar radiation and unpredictable tides. In addition, the duration of most open water workouts (1-6 hours) creates unique physiological challenges with thermoregulation, hydration status and muscle fuel stores [5]. The main physiological characteristics of open water swimmers are the ability to swim at a high percentage of speed (80-90%) for many hours. Moreover, to maintain high speed for many hours, endurance swimmers need high propulsion efficiency and low energy expenditure [2].

Methods and structure of the study. The effectiveness of training for two groups of swimmers was analyzed: the first group trained according to a stand-

ard program in the pool, and the second group included open water training using various exercises. The goal of the experiment was to determine how open water swimming affects performance and endurance.

A total of 40 swimmers of different levels of training, specializing in open water swimming, took part in the experiment. Participants were divided into two groups: a control group (20 people) and an experimental group (20 people). To check the level of training, we conducted tests that included standard exercises:

1. A 400 m freestyle test. Participants must swim 400 m for a time.
2. An open water swimming test (800 m). An open water swimming test, where swimmers must cover 800 m taking into account external conditions such as waves and currents.
3. Special exercises for stroke technique. Conducting training with an emphasis on the technique of various swimming styles (freestyle, breaststroke, etc.).

After determining the level of the swimmers, they were divided into two groups, each of which was trained according to a specific program. For the experimental study, the following exercises were selected for the group training in open water:

1. Progressive and regressive tasks (increasing and decreasing speed every 5 minutes for 25 minutes).
2. Tasks with different breathing options (every 3/4 of the stroke).
3. Swimming with fins and paddles for long distances.
4. Alternating swimming styles (dolphin with crawl).
5. Maximum acceleration (400 m) to simulate competitive starts and finishes.
6. Orientation on the water using buoys and new routes.
7. Swimming on the waves and with the current.

The second group followed a standard training program in the pool, which included general developmental and highly specialized exercises.

Results of the study and discussion. During the experiment, the results were collected using heart rate monitors and trackers to measure time and speed.

Group A (pool):

- Average speed per 100 meters: 1:30 min.
- Time per 400 meters: 6:00 min.
- Heart rate in the extreme zone (maximum): 180 beats per minute.

Group B (open water):

- Average speed per 100 meters: 1:25 min.
- Time per 400 meters: 5:50 min.
- Heart rate in the extreme zone (maximum): 170 beats per minute.



Comparing the results, it can be seen that Group B, which trained in open water, demonstrated greater speed and endurance compared to Group A. It can be concluded that open water swimming helps improve physical fitness and technique due to the variety of training and conditions (working with the current, waves, orientation, etc.). Based on the data obtained, it is possible to recommend including open water swimming in the training process of swimmers to improve their performance and adapt to real competition conditions. Open water training creates more versatile and resilient swimmers, better prepared for various physical loads and competition conditions.

The results of the study confirm the hypothesis that the inclusion of open water training helps to improve the performance of swimmers. It is especially important to note that the multi-component variability of training contributes not only to physical fitness, but also to the development of important psychological qualities, such as stress resistance and self-confidence.

The study showed that the development of internal speed and distance assessment skills is a key factor for successful performance in open water. Swimmers who included open water training were able to significantly improve their physical skills and condition, which ultimately led to an improvement in their athletic performance.

Conclusions. Thus, open water training may become an additional means of developing professional swimmers' training. An integrated approach to training, including a variety of conditions and routes, contributes to a significant improvement in the physical and psychological fitness of athletes, which ultimately leads to an increase in their athletic performance. Modern training methods should take into account the need to adapt to changing environmental conditions, which will increase the motivation and willingness of swimmers to use new training methods.

One of the main limitations of this study is the limited sample size, which may affect the generalization of the results to a wider population of swimmers. In addition, differences in the training level of the participants may have affected the results and their interpretation. The influence of external factors, such as weather conditions and water temperature, on swimmers' performance in open water should also be taken into account.

For further research, it is recommended to expand the sample to include swimmers with different levels of experience, as well as conduct long-term experiments to assess the stability of the obtained results over time. The study of additional psychological aspects,

such as stress levels and self-esteem, may also have a significant impact on understanding the factors that contribute to success in open water swimming.

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