Research on Scientific Theory and Method of Swimming Sports Training

Chengxin Yin*

School of Sports Training, Wuhan Sports University, Wuhan, China
*Corresponding author

Abstract: *As an important part of competitive sports, swimming plays an extremely important role in improving the scientific training level of athletes. With the continuous development of modern information technology, it has made great achievements in various fields of sports training. This paper uses research methods of literature and logical analysis to make a systematic analysis of the main trends of the current development of swimming sports, and then explores the scientific methods of swimming training. The research believes that for athletes, if they want to improve their swimming performance, they need to adopt scientific and effective training methods and constantly find their limits, constantly to create more excellent results.*

Keywords: *swimming, sports training, information technology, scientific, competitive sports*

1. Introduction

As an important part of competitive sports, swimming plays an extremely important role in improving the scientific training level of athletes. When the coach carries out sports training activities for the athletes, he should carry out comprehensively from the aspects of strength, speed, endurance and so on, combine with the actual situation of the athletes, execute the training plan according to the target, so as to ultimately improve the swimmer's own quality and promote the long-term and healthy development of the athletes[1].

In recent years, with the continuous deepening of physical education reform, more and more competitive sports have introduced a lot of modern technical means in the process of sports training. Our swimming sport has obtained very good competitive results in domestic and international application games. In the process of competitive training, many foreign excellent coaches are hired. Compared with the traditional swimming training process, they use more traditional methods of theory and practice. The traditional training method can hardly satisfy the improvement of the ability of Chinese elite athletes in the process of high-level competitive games. While learning from foreign excellent sports training methods, China has achieved good results in the application of information technology to swimming training, which requires athletes to improve the application of key movements and competition tactics in the process of analysis.

2. The main direction of swimming development

2.1 It lays more emphasis on the rational utilization of swimming technology

In the continuous study of modern swimming technology, it is found that the swimmers who simply have the advantage of physical strength are often not top in many aspects, and their performance is often not better than that of the athletes who have excellent swimming skills [2]. Therefore, it can be confirmed that the strength is not the key factor affecting the performance of swimming skills. It can be found that for swimming skills, what we should really pay attention to is the swimmer's power utilization ability in the water, that is, the efficiency of power utilization in the water. Only by effectively improving the driving force in the water with the help of our own power and reducing or reducing the resistance brought by the water in the swimming process can we really improve the swimming performance of the swimmer, which requires the athlete to have skilled swimming techniques. And it can give full play to the greatest advantage of swimming technology, such as Phelps, the Olympic swimming king, who can't be avoided in the study of the world swimming celebrity, but the study found that his power in the process of swimming is maintained at about 87W, while his

opponent often has higher power, but the speed in the process of swimming is slower than Phelps, difficult to win the championship. This is mainly because Phelps is able to swim at a constant speed for long periods of time and, as a result, has less resistance and is more stable in the water than his rivals often do.

2.2 Pay attention to the actual combat effect of technology

After the analysis of the actual role of swimming skills in swimming, we can continue to make a comparative analysis of the swimming talents. After the analysis of the swimming talents Popov, Biondi and Montgomery, we can find that the swimming skills of the excellent swimmers tend to be stable and have a certain unity of swimming skills. For example, when they swim, there is a relationship between the stroke and the stroke frequency, the range of their stroke distribution has a relationship with the range of their stroke distribution, and when they swim the same distance, if they have the same stroke amplitude, then the higher the stroke frequency, the faster they swim, and when they swim at the same stroke frequency, the larger the stroke range, the faster the swimming speed, in this case, it can be more helpful for the research of effective swimming techniques in the actual swimming competition, especially in some international competitions, world-class swimmers often have extraordinary swimming techniques, their research on stroke frequency and stroke length is far beyond people's imagination, they can skillfully master the combination of stroke frequency and stroke width to maximize their speed [3]. The continuous improvement of their skills also promotes the continuous development of swimming in the technical level. Of course, there are still many excellent swimmers in China. In recent years, emerging athletes such as Sun have mastered excellent frequency and span swimming techniques, and achieved reasonable coordination, effective adjustment, and rapid improvement of swimming level.

2.3 Pay attention to core strength and body coordination of special training

Although swimming is not a sport solely dependent on strength, the requirements for core strength are also very high. Because there is no point of force in swimming and the body is in an unstable state, core strength helps to stabilize the body. If the athletes' core strength is not strong, the water resistance of the hands and feet will increase, making it difficult to improve athletic performance. Core strength can improve a swimmer's explosive power and coordination [4]. By cultivating and training their core strength, swimming far mobilization can coordinate the body through the buttocks and transfer the strength of the limbs in the swimming process, so as to ensure that the power can be transferred from the buttocks to the arms quickly and stably. In the training process, in order to improve the core strength of swimmers, in the process of land training, ball exercises should be used to exercise swimmers' coordination ability and strengthen their control ability of body muscles, so as to ensure the rapid and stable transmission of core strength and the effective control of arm and leg muscles.

3. The development trend of swimming training

3.1 Reasonable combination of training amount and intensity

What should be emphasized in the training and strengthening process of modern swimming technology is the reasonable combination and effective match between training amount and training intensity. Therefore, modern swimming emphasizes the theory of large-amount training, which is built on the basis of improving swimmers' good performance. It pays attention to the training of swimmers' muscle endurance and emphasizes the speed of endurance. From the perspective of exercise physiology, it emphasizes the establishment of the basic ability of aerobic metabolism of swimmers, so as to promote the improvement of their own anaerobic metabolism ability, and it is this point of view that helps modern swimming competitive training find a new training direction and puts forward the theory of high-volume training [5]. Of course, the theory of high-volume training also has drawbacks. There are also differences between long distance and short distance. The training theory of large amount of exercise is more aimed at long distance swimming events. It has little effect on short distance swimming events that require explosive power and coordination. In training, we should pay attention to improve the intensity of training, require fast speed at the same time, to shorten the interval time, if the lack of high-intensity training, can only improve the endurance and aerobic metabolic capacity, the speed and anaerobic metabolic capacity of the promotion of little help.

3.2 Altitude training

Compared with the high-intensity training, altitude training is established in the plateau environment with low air pressure and low oxygen content. Athletes have to endure the double load of altitude anoxia and exercise anoxia to cultivate their comprehensive physical quality and increase the number of hemoglobin and total blood volume. Therefore, altitude training, as a way of swimming training, has been carried out by many swimmers in the past few years. Related research is also in the process of continuous development [6]. However, with the continuous in-depth research on altitude training, more and more swimming coaches and athletes have found that the results are not ideal, mainly because although the altitude environment can bring training loads to athletes, the psychological and physiological burdens it brings to athletes often lead to their own physical and mental disorders, and the training intensity is difficult to sustain. It is difficult to train with the same amount of exercise as usual, and it will adversely affect the immunity of athletes. According to relevant investigation and research, altitude training is helpful to improve the performance of speed athletes, while altitude training will inhibit the performance of endurance athletes. Therefore, now more and more sports training experts begin to emphasize the way of high oxygen and low training, using hyperbaric oxygen chamber to simulate the plateau environment, athletes themselves do not need to live in the plateau. Thus reducing their physiological tolerance, to avoid their physical and mental dysfunction, more conducive to swimmers to improve swimming performance, swimming training should pay attention to the individual differences of athletes and adopt different training plans.

3.3 Recovery training

For swimmers, being in a state of fatigue for a long time is easy to cause problems in their own physical quality. Training for the purpose of training often produces poor results, and at the same time, it is easy to bring lifelong physical damage to swimmers. Therefore, it is very important to study the fatigue mechanism of swimmers. Only in order to carry out targeted adjustment and recovery, can help swimmers maintain a good competitive state and avoid overwork injury. In swimming training, after high-intensity training, coaches should pay close attention to the cardiovascular indicators of athletes. Slow swimming in water is one of the training methods to recover the body. Nowadays, the recovery training for swimmers has become an indispensable part of the training, among which hyperthermia, massage, static stretching and related drug recovery are the most common means of recovery training. In addition, in the recent two years, the continuous improvement of psychological recovery training, nutritionist recovery and adjustment are effective means of recovery training [7].

3.4 Special training

For modern swimming training, the targeted training of swimmers is also in the process of continuous refinement. From the previous training and research of related swimming techniques to the gradual refinement of special ability, the targeted research of swimming sports is becoming clearer and clearer. For example, in the common kilometer swimming competition, it can be divided into specific training at the starting stage, mid-tour training and final sprint training through targeted special training, to study the body function system of athletes at each stage, study the changes of athletes' bodies, so as to find more effective special training means, study the physiological characteristics of athletes and the way of combining swimming techniques, so as to promote the continuous improvement of athletes' swimming performance.

3.5 Change cycle training

It is very important to carry out training in different periods for different types of swimmers, swimmers of different levels and swimmers with different needs. The division of multi-cycle training is mainly directly related to the training requirements of the athletes themselves and the training stage. For example, the lower age group usually has less competition time and more training time. Occasionally there are competitions need to be based on the actual situation to develop the relevant training cycle; adult athletes often have more competitions, and the arrangement of small training cycles is to better balance the relationship between training and competition, and also conducive to the coach's training arrangements and post-competition recovery [8]. Therefore, it is very common for swimmers with different levels and needs to adopt different training cycles, which is also an indispensable part of the whole training system.

4. Explore scientific methods of swimming training

4.1 Improve athletes' interest and increase training results

In the process of swimming, the athletes in the technical and physical aspects of the application of a variety of more detailed requirements, so that the improvement of athletic performance has a direct impact. In the process of traditional sports training, the correction of athletes' technical movements mainly relies on experience and summarizes and analyzes through coaches' direct observation. As a result, the ability of coaches directly affects the performance of athletes' technical level. By using modern information technology, the relevant videos of athletes' daily training and previous competitions can be well decomposed to correct the technical movements of various links in the process of swimming, and the wrong movements can be corrected more specifically in the process of training. Through the video, the athletes can know the advantages and disadvantages of their technical movements and the abilities of their opponents in the competition process more vividly, so that the athletes themselves can have a better understanding of their own and their opponents' competitive abilities in an all-round way, and with the help of coaches to develop better techniques and tactics. Finally, in the process of competitive competition, we can better cope with all kinds of unexpected events in the process of competition, so as to achieve the effect of improving sports performance.

4.2 Cultivate correct technical movements and strengthen movement stereotyping

Swimming has higher requirements on the athletes' body posture and the technical movements of each joint. The long time aerobic exercise makes the athlete's technical movement is not standard, it is easy to cause some unnecessary sports injury. Excellent athletes pay attention to the correction of various body technical movements in the process of training and competition. In traditional training methods, it is difficult for athletes to have a deep understanding of their own movement mistakes through coaches' explanation of subjective consciousness. Through the application of information technology, the video playback of each link of the athletes in the training process can effectively let the athletes find their own shortcomings in technical movements, so as to make more targeted corrections, and effectively avoid the non-standard movements in the normal competition and training process sports injuries.

4.3 Grasp the sports data of athletes objectively

The specific motion frequency and water resistance in the course of swimming need to be reasonable supported by certain technical data. The traditional training process requires coaches to manually count the data of stroke and kick in the training process of athletes, and formulate a series of action requirements through reasonable and scientific analysis. By using modern information technology, it can effectively and objectively count the number of strokes and the energy characteristics consumed by each part of the body during the training process. In peacetime games, the corresponding technical improvements and tactical applications are formulated in a more scientific way.

5. Conclusion

With the development of swimming to modern times, great progress has been made and obvious changes have been made on the technical level. With the increasing maturity of information technology, countries are constantly trying a series of training modes and methods in the process of applying information technology to swimming. For athletes, if they want to improve swimming performance, it is necessary to take scientific and effective training methods, constantly to find their own limits, constantly to create more excellent results.

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