The Concrete Application of Core Strength Training in Swimming Training

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Keywords: Swimming training; Core strength

Abstract: At present, swimming has become a strong sport in China, and strengthening core strength training has become a crucial task in swimming training. How to improve the core strength of athletes and apply core strength training in swimming training has become the focus of current professional research. Therefore, this paper will study the specific application of core strength training in swimming training based on the detailed analysis of core strength training, and it hopes to provide some reference for future work.

1. Introduction

Swimming, as a common sport, has been widely popularized at this stage. How to effectively carry out swimming training is also a topic that coaches have been studying and discussing to improve the swimming strength of athletes [1]. Swimming is a sport that requires athletes to have high physical quality and strong psychological quality. Additionally, swimming has the characteristics of antagonism and speed, athletes need a certain explosive force in the competition. Therefore, the importance of physical training in swimming is self-evident. Physical fitness training can strengthen the physical quality of athletes, so that athletes can compete in a good state and play their greatest potential [2]. European and American countries, as the world's swimming powers, continue to innovate in training methods with the continuous development of swimming events, more and more attention is paid to the functional training of small muscle groups to the training of large muscle groups. It combines some of the professional and technical characteristics of swimming with core strength training, so that core strength training has attracted everyone's attention, our country has attached great importance to the core strength training of athletes. In this regard, this paper will focus on the specific application of core strength training in swimming training.

2. Core strength training

Core strength training is a kind of strength training, the so-called "core" is the middle link of the human body. It is the area below the shoulder joint and above the hip joint, including the pelvis. It is a whole formed by the waist, pelvis and hip joint [3]. The "core" region consists mainly of 29 muscles. Core strength is not only conducive to maintaining human body balance and ensuring the stable performance of movements, but also it better coordination of upper and lower limbs, which can be regarded as the main link of athletes' strength.

2.1 Three explanations of core strength

At present, there are still great differences in details although the international interpretation of the core force is similar to each other [4]. There are three widely accepted explanations:

One is the polyfidus muscle, which is the main function of the core force. The perception of the polyfidus muscle can make the athletes feel and proprioception. The polyfidus will play a role in maintaining the stability of the athletes when the athletes are unsupported and unstable. In training, it needs to pay attention to the activation of polyfidus muscle to improve the training level of athletes.

Secondly, the core muscle is composed of the motor muscle and the stabilizer muscle, which is the source of the core strength. The motor muscles belong to the polyarticular muscles in the

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shallow position of the human body, Muscle centripetal contraction produces strength and accelerates speed[5].

The third is the stabilizing muscle, which is in a deeper position in the human body, belongs to the single joint muscle. The centrifugal contraction of muscles can control the body and maintain posture. Core muscle can be divided into whole muscle and local muscle according to the standard of anatomical position. Controlling spinal curvature and maintaining spinal stability can be accomplished by centrifugal contraction of muscle groups such as transverse process muscles in local muscles. Large-scale exercise needs to be accomplished by contraction of gluteus maximus and isometric muscles in the whole muscle.

2.2 Physiological principles of core strength training

Sitting posture and standing posture are two commonly used postures in human life and production practice, the maintenance and change of these two postures are mainly accomplished by the contraction of the core muscles. The core muscle group of human body not only has the function of fixing body posture, but also provides sufficient power for human body movement. The core muscles not only provide the necessary power for human to complete various movements if it analyzes this problem from a physiological point of view, but also ensure that the human body maintains a relatively static posture by maintaining the form of isometric contraction. It can find that the core strength of human beings is the key factor to ensure that their body posture changes freely after continuous comparison. Many core muscles need to cooperate and coordinate with each other in the process of completion whether it is a simple trunk posture or a relatively difficult gymnastic movement. Moreover, there are also corresponding differences in the role played by the core muscles in the process of maintaining different body postures. It can know that the nerve centers controlling the core muscles are not only very complex, but also the coordination between the nerve centers is constantly enhanced with the improvement of the coordination ability of the core muscles of different functions through in-depth analysis.

2.3 The training principle of core strength training

2.3.1 Step by step

Training must be arranged according to the scientific law of core strength development in core strength training. It should follow the principle of increasing difficulty from bare-handed to instrumental assistance, from static to dynamic, from stable to unstable state in making the core strength training plan.It should emphasize the accuracy of the actions, not the speed of completing the actions in the process of exercising related technical actions and strictly control the posture of the body at all times;In the training process, the coach can arrange for the promotion of athletes and carry out the next stage of training on the basis of ensuring that the current training content can be accurately and skillfully completed. Athletes should pay attention to regular breathing in the process of training to make changes in the movement of breathing coordination. Traditional strength training involves a large group of muscles on the surface, and is often performed with centripetal weight-bearing exercises, Emphasis is placed on the performance of muscle endurance and muscle contraction speed in training. Deep small muscle groups have been neglected for a long time, and no effective primary level can be obtained. Therefore, it should also follow the basic principle of gradual progress, emphasizing the small first, the big first, the inside first, the outside first, the stable state then the movement state in determining the difficulty level of core strength training.

2.3.2 Towards specialization

Core strength training must be closely combined with special technical characteristics, Core strength training should be carried out according to the special technical characteristics based on the actual physical fitness of athletes. Core strength training should be regarded as the need of special technology, and the strength of core parts should be specially trained.

2.4 Training method of core strength

Practice alone without instruments. Single-person equipment-free exercise is one of the most common ways of training athletes' core strength training, the core strength training of swimmers in the initial stage is mainly single-player without equipment training method, it cannot only improve the training level of athletes' core strength, but also reduce training time and improve training efficiency. This training method is mainly to help athletes feel the process of core muscle strength in the process of training, while guiding athletes to master the method of body control.

Practice with simple equipment. Athletes mainly use simple instruments such as balance ball, balance beam and Swiss ball to practice with simple instruments. It not only helps athletes to regulate the deep muscles of their core area, but also ensures that athletes can always maintain the correct movement posture through the use of these simple instruments, which lays a good foundation for the improvement of their sports efficiency and quality.

Complex instrument exercises. Professional swimmers with relatively high swimming level usually adopt complex equipment training. Athletes are required to master the methods of balancing ball standing on one foot, lifting dumbbells on upper limbs, squatting and other different instruments in this training process. It can achieve the goal of further improving the balance ability of athletes after mastering these methods.

3. Current development of core strength training in swimming training

In recent years, there are still some shortcomings in the specific application process although the training of core strength has been emphasized in swimming training, and some experience has been accumulated. Trainers are still relatively unfamiliar with core strength training as a relatively new training concept in recent years, and do not know exactly how to conduct core training. Not only that, some trainers will also question the training effect of core training and lack sufficient confidence so that it cannot help athletes to solve the problems of uncontrollable body posture, instability, inconsistency between arm stroke and leg kick during swimming, then athletes cannot break through the limitations, affecting the performance of athletes. Therefore, further research on core strength training in swimming and how to reasonably select a relatively scientific core strength training method that meets the needs of swimming has become the focus of current professional research.

4. Application of core strength training in swimming training

4.1 Making a scientific and reasonable training plan according to the time period

The training plan can be adjusted according to the development of the time process in swimming core strength training and the coach also needs to adjust the training plan according to the actual situation. Coaches should set training time according to the different characteristics of human muscles in normal swimming training so that athletes can stimulate their greatest potential in limited training time and get double training effect.The training time of athletes is gradually decreasing with the advent of competition and other schedules. Coaches should make reasonable planning of training time to enable athletes to achieve good results in competitions through training, it should pay attention to the training of athletes' core strength and strengthen training properly.

4.2 Choosing the proper training method can make the core strength training more effective with half the effort

The coach should also choose the appropriate and suitable training methods for athletes after defining the training plan. At present, the most commonly used core strength training methods in China are mainly two kinds, one is for backstroke and freestyle, the other is mainly for butterfly and breaststroke. The main points of training are also different due to the different types of training methods. In the first method of training, the athletes' physical state is relatively tense. They need to mobilize all the muscles above and below their bodies, and put all their attention on maintaining

static balance to achieve core strength training. If the first method emphasizes "static", the second method emphasizes "dynamic" when training with the second method, athletes' attention needs to be consistent with the development of their limbs at all times. Coaches should make rational use of the two training methods when arranging training to promote the overall development of athletes because of the different emphasis of the two training methods, it is necessary not only to exercise the "delicate" ability of athletes, but also to strengthen the dynamic training of athletes. Only through proper alternate training can we ensure the effectiveness of athletes' core strength training and reduce their sense of fatigue.

4.3 Paying attention to individualized training and make core strength training "teach students in accordance with their aptitude"

As the old saying goes, education must "teach students in accordance with their aptitude", and swimming training is the same. The physical fitness, muscle condition and physical function characteristics of different athletes are also different in the core strength training. Therefore, coaches must pay attention to the individual development of athletes in training and make training plans according to their respective characteristics. At present, swimming training in our country is mainly divided into two aspects: one is training in water, the other is training on land. Coaches should make reasonable training plans from these two aspects according to the trainers' characteristics, and not all the same, it is necessary to help athletes to train in a targeted way to make the core strength training play its greatest role. It is worth mentioning that, coaches must pay attention to the refinement of core strength training in the formulation of training programs because core strength training also has different emphasis, only in this way can we really improve the core strength of athletes and help them improve their swimming level.

Core strength training cannot only help athletes improve their balance ability in water and coordination ability of limbs, but also improve the strength of athletes' limbs, it speeds up swimming speed and enables athletes to achieve ideal results in the competition. In the application of core strength training in swimming training, coaches must play their guiding role although athletes are the main body, the individualized training programs suitable for different athletes are formulated from the aspects of training plan and training content on the basis of combining the actual situation of athletes, only in this way can we really ensure the improvement of the core strength of athletes and make training play the greatest role in promoting.

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