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Core Strength Training of Amateur Teen Male Swimming Athlete

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ABSTRACT. *At present, in China, the strength training for young swimmers (especially the high-level athletes who are in the stage of achieving performance standards) mostly uses traditional strength training methods, and how to systematically carry out core strength training to improve the muscle strength of swimmers balance and special technology lacks theoretical and practical application. As the application of core strength training in competitive swimming at home and abroad is getting deeper and more detailed, how to specifically combine core strength training with water training to establish a more scientific and reasonable training system is the current need for young swimmers.*

KEYWORDS: *Amateur, Swimming athlete, Core strength, Youth*

1. Introduction

Core strength training has attracted the attention of coaches and athletes with a new training concept, and has become one of the daily sports training programs of professional sports teams. However, in amateur training, especially in the basic training stage of young people, it has not received due attention. The significance of this research is to strengthen the requirements for the core strength of young swimmers in accordance with the characteristics of swimming events, effectively improve the athletes' special sports ability, to obtain the best training effect, and broaden the methed for the quality training of young swimmers.

2. The Function of Core Strength Training for Swimmers

2.1 Functions of Core Strength Training

The most vulnerable part of the human body is its core part. The body always stimulates the muscles around the core part under the necessary conditions (such as sports, especially high-intensity exercise) to protect and support the core area. Not only that, for the muscle strength of the limbs, the body will also be reasonably controlled and adjusted according to the specific situation of the core part's strength. The importance of core strength is self-evident[1].

From the macro perspective of enhancing the overall athletic ability, the core strength has played a supporting role. Specifically, there are the following aspects:

First, the support role is in sports technology. Whether an athlete can achieve a high level of coordination between the various muscles involved in sports and whether he can excellently control the body's center of gravity in high-speed sports determines his The level of special skills, for example, in some water sports such as swimming, rowing, kayaking, etc., having excellent physical fitness is one aspect, on the other hand, athletes must have the ability to control water, This ability to control water depends largely on the stability of the athlete's torso and body. Without the establishment and support of the core force, it is like the building has lost its base, and the stability of this movement will be impossible to talk about.

Second, the core power plays the role of a transmitter in human motion. The power generated by the human body is transmitted, coordinated, and integrated using the core power as a platform, so that the power output in the motion can efficiently complete the action. For example, the technical essentials of some athletic events are based on the proximal fixation of the muscles, and the end is used to complete the action, such as some throwing events in track and field, swinging and hitting in tennis, and smashing of volleyball. action. The core strength plays an important role in these sports. Under the transmission of core power, the strength of the lower limbs and torso are timely and accurately condensed to the upper limbs, so that the upper limbs can effectively gather the

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strength of the whole body to complete the whipping action.

Third, the core strength of strong athletes reduces the injury coefficient. First of all, the enhancement of core strength and the improvement of power control ability have strengthened the protective effect of the muscles at the core on the spine. Secondly, as the hub of the human movement chain, the coordination role played by the core part can provide a stable support point for the force of the limbs, thereby reducing the load that the human body needs to bear to a certain extent, so that the human body The probability of injury is minimized as much as possible.

In addition, the core strength also has a positive impact on the relevant professional technology by improving the ability to control muscles and the role of balance and coordination at the working level. The stabilization, balance and coordination of the core part are often the key links of the special technology. It can establish stable support for the movement of the limbs in high-speed and changeable movements, and form a reasonable muscle movement chain to connect, transfer and coordinate the strength of the muscles. The special skills of many projects have high requirements for the mobilization and participation of muscle strength of the entire body. The technical level of athletes depends largely on whether he is using the entire body to participate in sports or just rely on some muscles to complete the action. The level of core strength determines the athlete's ability to exercise the muscles of the whole body.

2.2 The Development of Core Strength Training in the Training of Professional Athletes

According to the national swimming team's documentary in preparation for the Brazilian Olympic Games, the national swimming team specifically introduced core strength training into daily land-based strength training in order to prepare for the Olympic Games to find a faster way to improve athletic performance. Now not only the national swimming team regards core strength training as a part of land practice, but also professional teams above the provincial level are also part of daily training. However, for amateur sports schools at the municipal level, core strength training is only known to coaches. Is a new term for the core strength method, content, and muscles that are not yet clear [2].

For swimming events, the strength of the limbs also comes from the core part of the human body. Athletes with strong core strength can better control the body position when swimming in the water and master the most reasonable technology. This is also due to the swimming program. Particularity: the fluid environment, so swimmers will not find a reasonable support point for their bodies like other onshore projects to complete the corresponding technical actions, so for swimmers, the core part is the body The only source of power. On the other hand, the core strength can also improve the coordination ability of the muscles involved in swimming, which plays a supporting role in the reasonable completion of related technical actions.

In addition, through the training of core strength, the athlete's sense of water has also been significantly improved, he can better control and adjust his body in the water, and complete technical movements in a standardized manner. Taking backstroke as an example, in addition to lying supine in the water and requiring a highly balanced body position, it also requires the coordination of arms and legs to produce a common joint force to push forward. In addition, athletes with poor core muscle strength can not maintain a good streamline shape in the water, causing the legs to sink, resulting in increased resistance, because in competitive swimming, even a slight sinking of the buttocks can encourage athletes to The resistance in the water is increased by 25%, which not only directly affects sports performance but also wastes more physical energy[3]. This shows that the core strength is very important for swimmers. For the young swimmers, all aspects of their bodies are in the stage of growth and development, and their functions are not perfect enough. It is not appropriate to engage in special training prematurely. It is necessary to lay a solid foundation and prepare for future special training. From now on, the core strength training will be carried out for them, and they can exercise well to the deep muscles and small muscle groups that were originally ignored, so that the muscles of the whole body can be developed in a balanced and coordinated manner. Therefore, for anyone, whether he is a professional or non-professional swimmer, it is essential to develop and improve his core strength. The improvement of core strength can not only help athletes make standard technical actions, greatly reduce the resistance of water flow to the human body, but also provide protection for athletes' bodies and minimize the probability of sports injuries.

2.3 Compared with Other Aerobic Exercises

Competitive swimming, in this vigorous exercise in a swimming pool, while overcoming its own gravity in the vertical direction, the athlete also has to overcome the fluid resistance encountered during forward movement. From the perspective of fluid mechanics, if the athlete's swimming speed is doubled, the confrontation is to

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increase the resistance by three times, so it takes three times the physical strength to overcome this increased resistance. It can be found that enhancing the strength of athletes is another important way to increase the speed of swimming in addition to improving the technical level. Based on this theory, and after a long period of exploration, the researchers attributed competitive swimming to a competitive event that focused on the fast strength and endurance strength required to complete each move. The resistance of the human body in the water far exceeds the level of air resistance[4]. Therefore, swimmers have excellent muscle strength as the basis and master the standard technical movements in order to minimize the fluid resistance. According to the differences in training environment, swimming strength training can be divided into two parts: land training and water training. Land training is a special training based on the requirements of swimming programs for related muscles. Athletes will gain a lot in this process, especially for younger athletes.

The muscle strength of the human body before puberty is highly plastic, and land training can play a role in this regard. Not only that, land training can also play a positive role in the flexibility, flexibility and stability of athlete muscles. One of the great benefits of land training is that athletes can get good core strength and waist and abdominal muscle strength through this training. Considering the decisive role played by core strength in swimming, the value of land training is fully reflected. In addition to the above functions, from the macro perspective of the overall training system, land training is also a useful supplement. Athletes can find fun in boring training and stimulate greater enthusiasm for training. At the same time, they can also develop their own ability to prevent injuries during land training. Phelps' coach said: My view on land training is this, it must be able to improve the performance of athletes, rather than destroy.

In contrast, the content of water strength training for competitive swimming is focused on specific items, that is, training for specific muscle groups. Compared with land-based strength exercises, the focus of water training is to provide the limbs with special strength qualities. At the same time, the body's muscles are adapted to the water environment and become slimmer. The overall shape is streamlined to reduce resistance. In addition, water training can make up for some of the shortcomings that are easily caused by land forces, such as excessive muscle strength, horizontal thickening, etc. If you consider it from an environmental perspective, the strength training on water is closer to the actual competition environment of the athletes, so this strength training is more targeted and effective.

2.4 Characteristics of Basic Training for Chinese Young Swimmers

According to relevant information, Chinese swimmers can reach a sports level of more than one level. The average age of them entering the children's sports school for practice is 8.2 years old, and then the average age of entering the provincial team for professional training is 12.6 years old. The most excellent after systematic training The age of performance is 15.6 years old. As the age increases, the decline in performance leads to the retirement age of 17.6 years, which means that the peak period for swimmers to maintain their personal competitive level is only 16 years old. If the athletes reach 15, 16, At the age of one, if there are no results, they will be eliminated in large numbers. Through this set of data, it reflects that most swimmers have been systematically trained since they were adolescents, and have received professional training in sports schools or provincial teams. They have put almost all their energy on training.

Therefore, under the actual conditions in China, the swimming movement fully embodies the principle of “succeeding early”. Youth should lay a solid foundation and prepare for future special training, so we should focus more on the athlete’s comprehensive ability, including coordination ability, control ability, balance ability, muscle strength feeling , The ability to cooperate with muscle groups, the rapid ability of the nervous system and the sense of water. In addition, the training plan must be formulated in accordance with the basic development of human beings. It cannot be the same as the training methods and concepts of adults, and it cannot violate the laws of natural growth and development. However, we must seize the sensitive periods of growth and development to carry out scientific training.

During the sensitive period of development, it is the responsibility of every trainer to effectively train and maximize the potential of athletes in this physical quality. If the sensitive period is missed and reasonable exercise is not performed when the athlete is young, then The opportunity is missed, and I won't be able to practice again when I grow up. For example, the skateboards that children play today may be able to master basic skills in one night for children, but it may be longer, slower, or impossible for adults to master. However, during sensitive periods, improper development of this quality will have a negative impact, which the coach must understand. For example, high-intensity speed and strength exercises should be developed in adolescence. If they are developed too early, it will cause small athletes to develop a “lump” during the foundation period, which not only increases resistance during swimming, but also will be buried. The sustainable development potential of athletes is ended, and the sports life of athletes is ended in advance.

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For the strength part of the swimming training for teenagers, first of all, it is necessary to put the coordination and coordination between the various muscle groups in the most prominent position. Excessive pursuit of simple muscle growth is unscientific; second, the methods and means of training, Should be mainly dynamic, supplemented by gravity exercises. Dynamic exercises are very helpful to improve the coordination and cooperation between muscles. On the contrary, the effects of gravity exercises are not very obvious, and they should not be carried out as much as possible; again, speed and strength, especially endurance exercises, should be a swimming program for teenagers The key content of strength training; in addition, the actual simulated swimming environment in strength exercises also has a positive effect on the improvement of athletes' skill.

3. Suggestions of the Core Strength Training of Young Swimmers

3.1 Freehand Training Methods

There are two main methods of freehand training. One is lateral bridge training. The purpose of training is to increase the strength of muscles related to body rotation on both sides of the muscle group. During the training process, the athlete should lie on one side with the palm perpendicular to the upper limb, Flat on the ground, and then fix the pelvis, tighten the core muscles, lift the hips up, legs, hips and head should be on the same straight line, the posture should be maintained 45 ~ 60s, intermittent 30s once.

3.2 Supine Leg Training

The purpose is to enhance the stability of the abdominal oblique muscles and other related muscle groups when turning, so that the athletes lie flat on the ground, their arms are straight against the body, the legs are raised and straightened, and after the pelvis is fixed, the legs are slowly oriented Put it down on one side and stop when the hips on the other side are about to separate. Keep the movement for 2 seconds and then return to the initial position. Repeat the training on the other side.

3.3 Swiss Ball Assisted Training Method

Swiss ball assisted training mainly includes: (1) sit-ups rotation training, the purpose is to enhance the stability and strength of abdominal oblique and rectus abdominis rotation. During training, the Swiss ball is located under the middle of the back, feet are perpendicular to the ground, arms are crossed on the chest and parallel to the shoulders, then the abdominal muscles are tightened, and the body is lifted to the side, the lifting angle should be less than 45°, Slowly lower your back until you return to the original state, and then change directions for training.

3.4 Push-Up Bridge Training

The purpose is to improve the ability to control the entire core muscle group and enhance the balance of the body. Training needs to place the two forearms on the Swiss ball, the toes are supported, and the pelvis is fixed, the ankle and the shoulder are in a straight line, and the movement is kept 30 ~ 45s.

3.5 Solid Ball Assisted Training Method

The solid ball assisted training is mainly seated throwing, the purpose is to enhance the stability of the core muscle group when rotating, two athletes sit on the Swiss ball, 3 to 4 meters away, facing each other, feet on the ground, fixed basin Bone, and then turn to throw or catch the ball, alternately, when receiving the ball, use the rotation of the body to reduce the ball speed, and then turn to the other side to complete the pitch.

3.6 Underwater Training Methods

The underwater training is mainly the prone balance training in water, and the purpose is to enhance the control ability of the abdomen and core muscle groups in the water. The training method is: placing a kick board on the lower chest to keep the body streamlined, and then fix the pelvis, through the core muscles The application of the group keeps the streamline shape of the body unchanged and does not lose balance. The legs

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continue to be exposed to the water, and the posture remains for 30 to 45s. Finally, the number of kick boards can be increased to increase the difficulty of training and ensure the training effect.

References

[1] Brown, T. (2013). Speed and agility: what defines them and how to train for both. strength & conditioning journal 日本ｽﾄﾚﾝｸﾞｽ & ｺﾝﾃﾞｨｼｮﾆﾝｸﾞ 協会機関誌p.20.

[2] Julian V Jones, David B Pyne, G Gregory Haff, & Robert U Newton. (2017). Comparison of ballistic and strength training on swimming turn and dry-land leg extensor characteristics in elite swimmers. International Journal of Sports Science & Coaching, vol.13, no.2, pp.795411772601.

[3] Tracy Ann Axel M.S., C.S.C.S, JILL A. CRUSSEMEYER, Kevyn Dean (2018). Field test performance of junior competitive surf athletes following a core strength training program. international journal of exercise science, vol.11, no.6, pp.696-707.

[4] Moran, Jason, Sandercock, Gavin R.H, Ramírez-Campillo, Rodrigo, et al (2018). Maturation-related differences in adaptations to resistance training in young male swimmers. The Journal of Strength & Conditioning Research, pp.32-33.