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Application and optimization of core stability training in university's volleyball teaching

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ABSTRACT

The sports circle has focused on the core stability training. With gradual improvement of competitive sports development level, the gap of athletes in the core stability likely leads to the competition failure. It is therefore necessary to focus on the core stability training. In university's volleyball teaching, the teachers must pay attention to the straining strength, allow the students to understand the significance of the core stability training, master the basic training skills and lay a solid foundation for the lifelong sports.

KEYWORDS

Core stability training; University's volleyball teaching; Core strength.



INTRODUCTION

The core area refers to whole complex area and its structural components, including waist, pelvis and hip, etc. The influence of core stability on the sports level was first discovered by European and American scholars, which has also subverted the concept of focusing on the limb training whilst ignoring the training of core areas in the traditional physical training. The core stability training has also been introduced to competitive athletic training and its positive role has been exhibited in competitive sports as well. Concurrently, the core stability training has been attended in all sports training. People begin to continuously explore how to carry out the core stability training for better effects in different competitive sports.

THE CORE STABILITY TRAINING

The "core" refers to the central parts of the human body. Its main function is to provide the necessary energy to the human body for movement, to maintain the stability and balance of the human body, to ensure the human body in motion can coordinately finish a movement. It consists of abdominal, back and hip muscles.

The difference between core stability and core strength

The core stability and core strength are the functions generated by the core areas of the body function. The difference between them is the different functional natures. The core stability signifies that the human core areas control the torso bones and muscles in humans to cause an equilibrium status of human body so that the strength is generated, transmitted and controlled optimally. The core strength refers to the rotating force and displacement energy generated in the premise of guaranteeing the human equilibrium of muscles in core areas in human body. The core stability focuses on the strength control whilst the core strength focuses on the scale of produced strength.

The role of core stability training

The core stability training must combine with the core strength training to facilitate the transmission of strength in human's upper and lower limbs. The major functions of the core stability include the following aspects:

1. To improve the athletes' dynamic balance and joint's stability'
2. To improve the balance ability for athletes;
3. To increase the athlete's core strength level.

The common training method for core stability

The core stability is different from the traditional physical training either in training methods or the training equipments. The core stability training follows similarly in orders and advances step by step and combines with the physical training and core strength training. It is implemented elementarily by 5 stages:

Stage I: The main training content is the equidistance contraction of muscle groups in core area;

Stage II: the main training content includes slow relaxing sports under the steady state;

Stage III: the main training content includes the static-force support training under both the unstable and stable states;

Stage IV: the main training content includes the dynamic drills under the unstable state. The content is upgraded from Stage III;

Stage V: the main training content is the dynamic resistance-proof sports under the unstable state. The content is deepened from Stage IV.

The core stability training in above 5 stages needs to the combo of different training methods. After years of practice, the core stability training methods mainly include single-player manual exercising method, single-appliance drilling method, and integrated appliance drilling method, standing practice under eye-opening and eye-closing state and dual-player drilling method. The time length and intensity of these training methods should be set scientifically as per the characteristics of player. In each exercise process, attentions must be paid to the posture control in bodies.

VOLLEYBALL GAME AND CORE STABILITY TRAINING

The special volleyball game quality

Any game is carried out based on the sufficient physical fitness, so is the volleyball game. The special physical fitness drills of volleyball players include the body posture, body function, sport quality and health level. What is most closely related with physical fitness is the sport quality. The volleyball game itself is an integrated test of human's jumping ability and sensitivity. Therefore, in university's volleyball teaching, the emphasis should be directed to the player's jumping ability and sensitivity. The player can be ensured to maintain the best competition state during sports only with the most basic sport quality. It is known from the related studies that the Chinese volleyball players are far lower than volleyball athletes in the sport quality in countries where the volleyball game is powerful, such as Brazil, America.

The relationship between core stability and volleyball game

Compared with other types of games, the volleyball game highly requires the coordination of various technical actions from thrusting against the ground, bouncing, ball-catching to rebounding. The entire process should be smooth and converged accurately. The strength produced by the lower limbs during thrusting against the ground is transfer to the upper limbs for catching and blocking the balls through the core area. The core stability can guarantee the strength transfer timely, stably, quickly and accurately, thus harvesting a better sports effect.

The significance of the core stability training in the university's volleyball training

Volleyball is a globally popular and welcomed game. It belongs to a skill-dominated ne-separated competition event. The competition level of volleyball game is rising and has greatly improved. An excellent volleyball team must not only have physical and intelligent advantages, but also have an outstanding technology and good athletic psychological quality. However, the physical fitness is still the basis in many factors that affect the level of volleyball game; the technical and intelligent level must be manifested necessarily with a robust physical fitness.

The core stability training is a new training method that has been emerging in sports field in recent years. With practice test and scientific argumentation, the core stability training can not only make the traditional physical training effect more outstanding, but also make the athletes' physical function extended to the deep muscles. The special strength level and fast moving ability in athletes can be enhanced remarkably.

In the university's volleyball lessons, the core stability training can allow students understand and master the science, methods and skills of core stability training, and guide the students to enhance their own physical fitness for completion with scientific core stability training means, thus improving the sports achievement.

APPLICATION OF THE CORE STABILITY TRAINING IN UNIVERSITY'S VOLLEYBALL TEACHING

Basic stability training

The basis of athletes' core stability training is the basic stability. If the basic stability is poor, it will have influence on the skill levels and game performance level and bring the hindrance to the core stability training in later period. The robust fitness is the premise of sports and it is a basic platform to play the role of special sport advantages.

The basic stability indicators mainly include bending-forward, bending-backward and bending-sideward postures. What the bending-forward posture reacts is the front ability of human's core area; What the ending-backward posture reacts is the back ability of ability of human's core area; and what the bending-sideward posture reacts is the flank ability of human's core area. The major method in basic training is the combined bending and supporting exercise. The core training method of front core muscles is bending downwards with hands support and feet propped on the platform, similarly to push-up; the core training method of back core muscles is bending upwards with hands support and feet propped up on the platform; the core training method of side core muscles is bending sideward with hands propped on the platform upwards, one arm supported and other arm on the leg freely. In addition to the combined bending and supporting exercise, there are also sideward rotation training, or practice on the unstable instruments.

With trainings, the front core muscles improve the ability significantly. The most direct evidence is that the rectus abdominis muscle improves the control ability apparently. After muscle contraction, the intra-abdominal pressure can be increased so that the body's stability is strengthened. With trainings, the back core muscle contraction improves significantly. The most direct evidence is that the waist muscle improves the control ability and the waist muscle strength increases greatly so that the stability improves. With trainings, the working ability of flank core area improves apparently as well, and the stimulus is transferred to the external oblique abdominal muscle, internal oblique abdominis so that the body's stability improves.

Balance training

Balance training is an important content of athletes' core stability training whilst the strengthened core stability can also promote further the body's balance level. Only when the volleyball players have good balance skill, they can flexibly control their own bodies so that their bodies present a higher coordinated balance skill in any state. For example, in the commonly-used net-blocking motion, the volleyball player executes a series of motions: jumping-staying in air-landing during the net-blocking process. During staying in the air, the player's balance will affect the athlete's body's posture whilst if the balance is damaged at landing process, they may cause injuries on ankles or hip joints.

The balance training is assisted by instrument-exercising. The typical instrument is mainly the balance board. The volleyball game characteristics may be combined for ball catching drills in the air so that the body's muscle system is coordinated with the nervous system. Or with the adjustment of supportive area, or separation or merging of supportive objects, the training difficulties can be increased so that the training is designed to allow the athletes can cope with all kinds of emergencies during the volleyball games easily and conveniently.

The scientific and reasonable training can improve the body's balance significantly though the genetic factor plays an important role in body's balance. With balance training, the control ability and strength of deep muscles can be enhanced

apparently, the nerve coordination and controllability can improve and the body's coordination and controllability can be flexible and unified.

Net-blocking control force training

1. Net-blocking training by jump and movement from left standing position

In volleyball game, the athletes need to adopt the action of jumping from standing position to catch the ball when the other side services the second-spot ball by implementing the fastball tactics. The height of jumping from standing position is larger than the bouncing height during movement and net-blocking. As there is no run-up, it is a great test on the athletes' bouncing ability. The athletes can not only analyze the opponent's tactic types accurately in the first time, but also have the powerful abilities of continuous jumping and staying in the air. Net-blocking training by jump and movement from left standing position is mainly purposed to improve the athletes' ability of staying in the air, and ensure the stable balance of bodies during staying in the air. The increased time of staying in the air not only depicts that the player has a powerful strength in lower limbs, but also indicates the player has a stronger core stabilities and can play the role of strength in lower limbs across the core area.

2. Net-blocking training by jump and movement from right standing position

Typically, the advantageous side is on right in human. Therefore, the person has some advantages when at exercise or movement by the own advantageous side. With Net-blocking training by jump and movement from right standing position, it may cause a more coordinated and balanced effect in movement strength on both right and left sides. The usual training method includes drop jump, basic net-blocking movement training and pace training, which are adapted by comprehensively considering the special training characteristic and training effect. When bouncing during net-blocking, the athletes will transfer the strength of lower limbs to the body's core area and upper limbs through the stability of core areas so that the body's posture is adjusted, and the upper limbs are adjusted as appropriate to the ball positions and maintain a relatively accurate position relation with the ball. With trainings, it is obvious that the athletes increase their strength in lower limbs, improve the waist and abdominal strength significantly, enlarge the displacement amplitude, speed up and extend the time of staying in the air remarkably.

3. Net-blocking training by left run-up, jump and movement

In volleyball game, more than an half of actions are net-blocking that is an important mean to contain the opponent's attack. The player must maintain the net-blocking actions anytime, make a timely net-blocking decision to adapt the most reliable method during the game and catch and throw the balls to the opponent with the best convenient pathway as the players feel confused by chaos owing to the constantly changing tactics during the game. Net-blocking training by left run-up, jump and movement is mainly purposed to respond to the attack from No. 2 player. The higher the sport level the team is, the more the attack number of No. 2 player will be, and the higher the net-blocking ability is required for the player in No. 2 position.

Net-blocking training by left run-up, jump and movement is mainly to spur the external oblique abdominal muscle, internal oblique and pelvic girdle. With training of these muscles, the player can maintain a scientific and stable posture under the intense and diverse motion states, thus improving the stability of core areas. It is recommended to carry out the training as per the individualities. Different training methods are adopted as per the characteristics of individual athletes. The training quantity and intensity must be considered carefully.

4. Net-blocking training by right run-up, jump and movement

The action is mainly in order to block the opponent's fastball and protect the attack of player in No. 4 positions in the team. The attack under main attack covertures is the most frequently used tactic though the attack points are not concentrated at the present improvement premise of volleyball competition level. Likewise, many athletes have more familiar action of blocking on right than left as the right is the advantageous side of most athletes.

In the training, the automation of action must be attended so that the acquired habited coordinative action skills can be exhibited in athletes. The training is a comprehensive consideration of net-blocking ability of muscles, decision skills of brain and temporary response ability.

RECOMMENDATION ON OPTIMIZATION OF CORE STABILITY TRAINING IN UNIVERSITY'S VOLLEYBALL TEACHING

Give priority of special characteristic of volleyball

The core stability training is commonly applied in sports, healthcare, medical and health industry. In term of physical fitness training in sports, it is also listed as an important training item in gymnastics, diving, etc. Additionally, the core stability training content is very broad, which demands that the priority must be given to the special characteristic of

volleyball game, the training content that is conducive to improve the volleyball game levels must be selected at training content choice.

Consider the action structure of volleyball game

There are many methods for core stability training. The angle, velocity and strength of actions are differently required as the games, training items and actions are diversified. Full account should be taken into the specificity of volleyball games, the conventional actions are broken down, the training method that is the most approximate to the special action so as to improve the training effect action during the core stability training for athletes in university's volleyball teaching.

Combine the trainings of core stability and other special items in volleyball game

The core stability training can strengthen the athlete's body control force so that the muscles in body's core area can play the coordinated and stabilized role during the sports. In training process, the relation between the trainings of core stability and special items in volleyball game must be dealt with better and the values generated in the core stability training on the physical training must be highlighted. Nevertheless, the core stability training cannot substitute the training of special items in volleyball game totally.

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