
The Nature Of Volleyball Activity

Volleyball is a game played between two teams ranging between 2-6 players per side. The aim is to hit the volleyball over the net (2.43m for men and 2.24 m for women). Through this, both teams score points if the ball hits the ground on the opponent's side of the court. Each team hits the ball only 3 times (Dig, set, and spike). The ball cannot be double touched. If this rule is not followed, the opponent team earns a point. Lastly, the ball must be kept within the confine of the volleyball court (18m X 9m). For an elite volleyball player to be able to compete at a high level of play, rules must be complied, with the support of their fitness components.

Movement patterns

Volleyball can be analysed through video and computer tracking, to determine the actions and movement of an elite volleyball player over the course of a match. "The maximum distance of that player in one rally was 34.12 meters. The average total distance of the spiker's movement during one set was 398 m." (ResearchGate, 2017) This analysis suggests that any key player on the court has to complete a series of moments to cover a large distance over the court, such as; jumping, spiking, blocking, lunging for the ball, changing direction, lateral movements across court and forwards/upwards arm movements linked to playing volleyball.

Fitness components

Volleyball involves a number of fitness components at a high level of play. Cardio respiratory endurance involves using the whole body for a long period of time, through continual movement around the court. It also helps with recovering. Power, a combination of speed and strength, is evident in explosive actions and movement such as spiking or blocking. Speed is an integral part of the game as players sprint to the ball, either passing to team mates, or over the net. After this process, the player applies speed to return to their position on court in time, ready for the next play. The player constantly changes direction as they respond to their opponent. This agility combined with the change of direction is crucial in volleyball. Local muscular endurance, the ability to use particular muscle groups for long periods of time is also used.

Energy requirements

All three energy systems interplay in volleyball: Aerobic energy system, Lactic acid energy system and APT/CP energy system. The ATP/CP system, lasts 2-8 seconds, relying on body stores of ATP, providing energy for high intensity activities. It is used for activities that are short and use maximum intensity (95-100%). This system is used for serving, blocking, or spiking. Recovery time effects energy levels, as it takes five minutes. Therefore, the anerobic energy system plays a vital role. "that it may become the dominant producer of ATP during repeated phosphate efforts, having insufficient recovery time to allow full phosphocreatine replacement." Smyth (2006). The Lactic acid system dominates the energy system, as it aids muscular contraction via breaking down glycogen stored in muscles or liver, without oxygen. It also contributes with energy in high intensity efforts (85%-95%), for up to 3 minutes, before lactic acid builds up. Rest is crucial between points. Well-trained aerobic systems can clear some of

this blood lactate through continuous movements. Activities over 3 minutes, cause the Aerobic system to dominate contributors of energy, (70-85%). Due to this, the game can be played for prolonged periods of time, essentially making the Aerobic system the dominant system to endure a full game of volleyball at a high intensity. In volleyball the energy contribution interplays between the ATP-CP and the lactic acid system. If the rallies are quite long the aerobic energy system increases its contribution to energy production. A positive about this system is that there are no limiting by-products whereas the anaerobic energy system results in a build-up of lactic acid.

Fitness Tests

The three tests that were used to determine our level of fitness within a game of volleyball were, the Illinois agility, vertical jump test and the beep test.

Agility is used by elite volleyballers to position themselves under the ball. Compared to the works of an elite athlete, a recreational athlete (like myself) can struggle with the agility. This can be tested through the Illinois agility test. This tests the ability to turn in different directions and at different angles. "An elite athlete (professional) should reach"

Endurance is needed to complete a whole game of volleyball, as a game can range between 60- 90 minutes. Rests are sparse, the athlete needs to have a strong endurance. Endurance can be tested through the use of the beep test. As a recreational athlete I achieved a total of 8.6 on the beep test, in comparison to an elite player this can be seen as a low number. According to Ascot village Leisure centre (2018), to reach elite status on the beep test you must obtain "15+". As my result was much smaller this shows that I would more than likely be unable to play a full game of volleyball and would fatigue easily.

Lastly, power is used to spike the ball at high speeds as well as deflect the ball from going over the net. As a volleyball player power in their vertical jump is essential. Reaching a total of 34 cm this is still nowhere near what is needed to compete with elite athletes. As elite female athletes reach heights of 45-50 cm (Ncsas sports, 2007) This shows my vertical jump close to the elite level, but work on my power component is needed, to reach this level, through circuit training. Through circuit training the player is exposed to different methods to work on power. Ultimately allowing them to unlock their full potential.

Overall, as recreational athlete, I scored well in fitness testing. Conversely, improvement is vital to play at an elite level. This is due to my cardiovascular endurance and agility. As my results for both test was far off the elite level of play it can be said that they need to be improved to reach an elite standard. Thus, not making me suited to the sport.