Improving the speed performance of a short distance athlete

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There are several contradictions in the history of sprinting regarding the development and improvement of an athletes' speed. This emphasise the believe that sprinters are born and not created (Douglas 2014). However, Seana (2016) argue that each athlete has a different type of muscle fiber compiled within their muscles. Athletes that have more fast-twitching muscles are more capable of sprinting, while athletes with more slow twitching muscles are better performers over longer distances. In addition, an athletes' specific muscle type can be trained and regulated through specialised conditioning according to their muscle fibre. As such, fast-twitch fibers can be improved with sprints, weight preparation, and high intensity interval training, where long distance running will assist in developing slow-twitch muscles. Contrastingly, fast-twitch muscles also use less energy, given that it is more explosive, nevertheless, these muscles get tired quicker. Sauer (2018) state that genetic factors such as the size, body composition, mitochondria, and the fiber type of an athlete is heritable, and can therefore only be adapted and not changed.

Rautenbach (2019) further strengthen the fact that athletes can improve their speed performance through practising and developing accurate technique, physiological conditioning, strength training, as well as psychological preparation and planning. Therefore, the athlete that is the "quickest" does not automatically win the race. Contrastingly, the athlete who runs the furthest within the same time, while obtaining optimum speed have a higher chance of winning the race. This

statement is supported with Usian Bolt's world record of 9.58 seconds on the 100 meter sprint, where he kept his maximum speed for less than 20 meters.

Stander (2017) highlight several aspects that need to be taken into consideration to develop an athletes' speed. This includes faster leg movement of the athlete, where leg speed can be improved, but according to a marginal tempo. Athletes' stride length should be increased and maintained throughout the race. This technique requires a great deal of conditioning due to the fact that it is not a natural way of running. Therefore, the increasing of stride lengths improves the speed of an athlete dramatically. Speed can also be developed through sustaining top speed over a longer period of time. In addition, practise sessions that include speed endurance can also lead to improvement of an athletes' sprinting time, but it is not recommended as a natural way of running. As such, strength and conditioning during several practise sessions is crucial to enable the athlete to efficiently complete these unnatural ways of running.

Another way to improve an athletes' running speed is to focus on eccentric and isometric exercises. This implies that an athletes' hamstring does not just act as knee flexors, but they also serve as a support system that keeps the knee joint stable while the force conveys from the hips. Therefore, strong hamstrings assist the glutes with hip extension and subsequently slows the knee extension down during the swing phase, which will ultimately lead to improved running speed. Furthermore, the effective use of an athletes' arms serves as a vital factor to improve their running speed. It is recommended that athletes' elbows are kept at 90 degrees, where each hand must be brought up in front of their face. In addition, the athletes body must not bend forward along with sagging shoulders, given that it will slow the athlete down (Sacks, 2015).

In order to increase an athletes speed performance, their

explosive power needs to be trained and maintained effectively. Therefore, several repetitions of explosive movements must be practised to keep the athletes' running form in shape. Different exercises can be done to develop an athletes' speed; such as knee pick-ups where their knees are raised up until their waist within a short distance of 10 meters. The athletes' main focus should be on their arms and elbows, where their elbows should be held at a 90-degree angle, as well as keeping their arms tension free. This exercise will also pressure the athlete to make as many ground contacts as they can.

Tuck jump exercises also assist athletes to develop speed. As such, athletes' need to squat down, followed with straight high jumps. The athletes' knees must be lifted up to their chest, where their landing must be shuttle and soft on their feet. Moreover, rocket jumps also improve the running speed of athletes. This exercise incorporates squatting, where the athlete explodes into the air with their body kept in a straight position and their arms stretched out above their head.

Skips can also increase an athletes' sprinting speed. The athlete should try to lift their feet as high as possible through using their arms to assist their bodies on the high jumps. This exercise can be adapted, where athletes can skip over a specific distance. Therefore, athletes should attempt to skip as far as they can with each skip. This workout can be done over 30 meters (Stirner, 2019).

Again, Stander (2017) emphasise exercises that can be done in order to develop a good running technique, that will ultimately lead to the athletes' development of speed. As such, athletes' can practise high knees. Here the athlete jogs while they lift their knees high and move their feet downwards in a fast and straight position. The reach exercise can also be practised to generate speed. Therefore, the athlete must practise the exaggeration of each foreleg in a downfield

position on the grass and not on the track.

Another method of developing speed within an athlete, is the running high on their toes exercise. Additionally, athletes must appear in a “tall” position, while they rise as high as possible on the ball of their feet. The athletes must then run on the definite spot that they are standing on, lean forwards from their heels, and then run down field staying high on the ball of their feet.

As such, the arm reach exercise can also be an effective approach to generate speed. The athlete must try and exaggerate their arm reach without attempting to run faster. The lead arm must be kept low while the athlete reaches forward. This technique will allow the athlete to run faster without any extra physical effort. Also, taking into consideration that the athletes’ hand and trail arm must not be lifted higher than their hips.

An alternative technique that can be incorporated is where the athlete must bound forward. This implies that athletes must bound forward and not upward, where they run down to the field in order for their head to maintain a straight position. The athlete must concentrate to always have one foot on their ground while they push against the ground with force. If the athlete jumps upwards, both their feet will be in the air, and it will be easy to assess any faults that the athlete makes.

In addition, athletes can incorporate the bounce exercise, where they have to lock their knees and bound forward through flipping their ankles. Athletes’ can also include the lean exercise within their training sessions. Here the athlete must stand with both of their feet together and lean forward from them heals which is about 30 degrees from a vertical angle. This lean must be sustained while the athlete strides downwards on the field.

In order to develop speed, athletes can make use of the run

tall exercise. In addition, the athlete must put their hands against a wall, and back up as far as they can with their heels still on the ground. Thereafter, the athlete must rise on their toes while they lift their leading knee. It is crucial that the heel, hip and knee must stay in line at all given times.

Lastly, a relaxation exercise can be done in order to develop a good technique that will result in development of speed performance. The athlete must run with a total of 90 percent effort over 30 to 50 meters. Here the athlete must try to stay as relaxed as possible, while they run with an excessively loose jaw and relaxed hands. The emphasis is placed on the fact that the training of this technique must be free of effort.

Coultman (2018) identified several factors that sprinters should keep in mind when running, that will subsequently have an effect on the athletes' speed performance. As such, athletes must try to keep their head in line with their spine, while they focus their eyesight directly down the track. The jaw and neck muscles of athletes should be relaxed at all times. Athletes' should also stray from clenching on their teeth. In addition, athletes' shoulders should not be raised up to their ear lopes, but rather be kept low and relaxed. Additionally, athletes should run with open palms, while their arms and legs correspond with each other. Athletes should also ensure that any extensions and flexing of their hip does not take place, due to the fact that it will limit the athletes' range of motion. Another factor that is crucial in order to ensure an effective sprint, is that athletes should run on the ball of their feet and push forward with their toes. As such, athletes should maintain a long and comfortable stride, given that over striding of the legs will result in less power to use, and also stress and un-comfortability on the hamstrings of the athlete.

Genders (2016) also emphasise different types of running

workouts in order to increase an athletes' speed. Therefore, hills can be incorporated within training sessions, where it improves endurance with minimum muscle stress and elevate an effective running form. Another exercise that can be incorporated is fartleks. Fartleks are a Swedish word for speed play. This implies that the athlete will learn to run faster, combined with slower recovery jogs, and short rest intervals. Furthermore, interval training also assists athletes to run at a specific speed and a pre-set distance, as well as a specific recovery/rest period. This all depends on the fitness of the athlete. Because of the fact that an athletes sprinting form worsen approximately 75 percent into their race. As such, athletes need to be taught to maintain their sprint for 25 meters before the finish line. At this stage, athletes must develop a conditioned reflex, where they lift their knees higher, work harder with their arms, get on their toes into a tall running action, staying loose with their jaws and hands still relaxed, as well as focusing their eyes on the finish line, without looking around them.

To conclude, it is not natural for any athlete to run with high knees, on their toes, pushing explosively while running, or to work vigorously with their arms. Therefore, enough strength and conditioning is paramount within any sprinters workout. The abovementioned sprinting exercises must be done on a regular basis, in order for the athlete to adapt these exercises as a habit (Stander, 2017).

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