

## **How important is *core strength* in Taekwon-Do?**

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In answering this question we need to consider firstly how beneficial the core is within the body itself. To do this, an understanding of what the core is needs to be established. This in turn allows us to develop a definition of core strength. From these understandings, we can then move forward into exploration of how best to train the core and the role Taekwon-Do can take in the development of core strength. The importance of core strength in Taekwon-do is seen in a variety of benefits including strengthening, stabilizing and improving performance.

### *Defining the Core:*

The core not only consists of the entire torso but also includes the erector spinae, multifidus, as well as the pelvic floor muscles and the diaphragm. The core muscles of the body are like the central link in a chain, connecting your upper and lower body. The core is the area known as the abdominal wall and is composed of skin, fascia and four pairs of muscles: external oblique, internal oblique, transversus abdominis and rectus abdominis. (Tortora & Derrickson, 2008). These muscles run from superficial to deep. In each layer, the muscle fascicles extend in a different direction. This is a structural arrangement that affords considerable protection to the abdominal visceral, especially when the muscles have good tone. The group of muscles of the abdominal wall help contain and protect the abdominal viscera; flex, laterally flex and rotate the vertebral column at the intervertebral joints, compress the abdomen during forced exhalation; and produce the force for defecation, urination and child birth. (Tortora & Derrickson, 2008).

### *What is Core Strength?*

'Core strength' is defined in the dictionary as the strength of the underlying muscles of the torso, which help determine posture. (Collins English Dictionary ) Core strength is the ability to control the position and motion of the trunk over the pelvis to allow optimum production, transfer and control of force and motion to the terminal

segment in integrated athletic activities. (Kibler, 2006) Core strength is the stability that is seen as being pivotal for efficient biomechanical function to maximize force generation and minimise joint loads in all types of activities (Kibler, 2006)

### Who has core strength?

The image that most quickly comes to mind when thinking of a person who has core strength, is someone with a six-pack of abs. But as we learn more about the core, we come to realize that the core is more than the anterior wall of the torso. It is also understood that every action from bending, reaching and twisting that is performed every day comes from the core. Therefore each and every person develops core strength through natural movement. It is the level of core strength that varies from person to person.

The level of strength is dependent on age, lifestyle factors like occupation and recreational activities, as well as fitness levels. Office workers for example, often have poor core strength due to the tendency to sit for long periods.

### Developing Core Strength:

Core strength needs to be developed because all necessary motions either originate in the core or move through it. (Healthbeat) One of the primary functions of the core is to stabilize and protect the spine by creating stiffness that limits excessive movement in any direction.

Strengthening the core is not limited to one form of exercise and can be approached in many ways. .Training in Taekwon-Do conditions the core both directly and indirectly. An example is a punching exercise performed in a sitting stance, first taught to beginner student and used at times as a warm up exercise. This punching exercise develops leg strength, breath control and coordination. Performing a punch in a sitting stance requires the use of the core muscles for stability and the generation of power in tensing muscles. Every stance, every technique and every motion has an element of conditioning for the core because of its function in connecting the upper and lower body. The generation of power is rooted in the muscles that make up the core in combination with the large leg muscles. This form

of core strengthening is very specific to Taekwon-Do. In building a stronger core it would be beneficial to include static and dynamic exercises that include instability components like Swiss ball exercises as well as stability based like Pilates. A variety of training that includes weights, cardio, plyometric and stretching is essential for a well balance core strength training plan.

There are a vast number of exercises designed to develop and improve core strength. I have selected five basic exercises that require no equipment making them easy to implement anywhere. These exercises create a foundation of a training plan for beginning students and instructors in Taekwon-Do that can be incorporated inside and outside of trainings. These exercises all work on a group of muscles rather than in isolation and target the core by improving stability and muscle activation. They each have elements that can be utilized in developing strength in fundamental Taekwon-Do techniques. These exercises are the Ab Switch, Front Plank, Squats, Lunges and Glute Bridge.

**Ab Switch:** A simple exercise to activate the front abdominal muscles.

**Body Position:** Lie on a flat surface or stand in a parallel stance.

**Instructions:** Pull the belly button up and in towards the spine. For beginners a visual cue is to place a finger (gently) on the abdomen. The key is to not hold the breath, while engaging this muscle. Hold for 5 seconds and repeat (Ibrahim, 2015).

**Benefits:** The Ab switch exercise teaches the student to engage the abdominal muscles by emphasizing good posture and bracing for impact. This exercise can aid in teaching breath control and learning how to tense the abdomen with movements by utilizing a sharp exhaling breath at the moment of impact or execution. (McPhail, 2016)

**Front Plank:** The plank is a good core exercise to help build strength and stability.

**Body Position:** Lie flat on the stomach, placing the elbows directly under the shoulders and rest on the forearms and legs together.

**Instructions:** From this starting position lift the body off the ground to form a 90° angle with the elbows and legs out straight balancing on the balls of the feet. The

key is to keep the abdomen tense, while the back maintains a straight position. Hold for 1 minute to begin with and rest for 30 seconds. Repeat this either as a set or a benchmark to work on increasing time. It is important to make sure the core does not sag creating hyperextension in the lower back or let the thighs touch the ground and to keep the bottom down. (Healthbeat)

**Benefits:** The front plank is a whole body work out that not only focuses on the core muscles it also works other large muscle groups in both your arms and legs. The front plank is now a part of the fitness test for black belt gradings. The front plank has many variables and scaling options that make it a good starting point in any core strength training program.

**Squats:** A proper squat not only works the quadriceps, hamstrings and calf muscles of the leg it also engages the core, by maintaining balance and stability.

**Body Position:** Place feet just a little wider than shoulder-width apart, with toes slightly turned out. Stand tall with the shoulders pulled back, chest forward while maintaining the natural arch of the lower back.

**Instructions:** Face forward, allow the arms to hang by the sides and engage the core to stabilize the body. Transfer the body weight towards the heels and slightly hinge forward at the hips while keeping the back straight. Bend at the knees so they are directly over the feet and slowly lower the hips. Aim to bring the thighs as close to parallel to the floor as possible and pause for one second. Avoid arching or rounding the back, and keep the torso upright. Force the buttocks back, and if needed, extend your arms forward to help keep your balance. Push through the heels and straighten the knees and hips to come back to the starting point. Squeeze the gluteal muscles at the top of the motion. Repeat in sets or in a time frame (Caines, 2015)

**Benefits:** Squats are one of the best functional exercises that promote mobility and balance. These benefits translate into a body that moves more efficiently in the real world. Maintaining balance while performing a squat engages the core muscle to stabilize therefore strengthening the muscles allowing the body to be balanced, prevent injuries, tone and boost performance. (Mercola, 2012).

**Lunges:** Lunges are one of the most effective lower body exercises. (Caines, The Benefits of Lunges, 2014). It is an important exercise that builds on strength needed to perform a good walking stance used in Taekwon-Do.

**Body Position:** Step forward into a walking stance position. The width of the stance should be at least a shoulder width apart and the length one and a half shoulder widths apart. The front knee is bent forward and in line with the ankle and the back leg is locked straight out.

**Instructions:** Drop the body weight by bending the back knee so the heel lifts off the ground and a straight line is formed from the shoulder, through the hip to the knee. Keep the back neutral and the chin parallel to the floor. Shoulders and hips are square and even. Engage the abdominal muscles by pulling in. Hold the position for at least 1 second before standing upright to the starting position. Repeat using the other side, this can be performed by stepping forward and backwards or switching on the spot. (Healthbeat)

**Benefits:** Proper form engages the core muscles, including the back and the abdominals by keeping the body upright and balance through moving the hips up and down. (Caines, The Benefits of Lunges, 2014)

**Glute Bridge:** A bridge is a classic core exercise, used to strengthen the lower back, gluteals and hamstrings especially in rehab.

**Body Position:** Lie with back on the ground and the knees bent to allow feet to be flat on the ground. Position the feet in line with the shoulders. Keep the back in a neutral position, not arched and not pressed into the floor. Avoid tilting the hips.

**Instructions:** Tighten the abdominal muscles and raise both hips off the floor in a horizontal position. Lift until the hips are aligned with the knees and shoulders. Hold the position for at least 1 to 10 seconds, relax and then repeat. (Mayo Clinic Staff, 2014)

**Benefits:** The Glute Bridge is important for improving core stabilization while the hips are extending. This is an important position in the prevention of lower back pain due to the position of the lumbar spine being stabilized during extension. (Michelle, 2016) It also helps stabilize the pelvis through training the hip extension which is vital for Taekwon-Do practitioners especially when performing a front kick technique like the front snap kick.

### Benefits of Core Strength:

The benefits of core strength are continually being investigated. Research is being conducted into how a strong core can help people of different ages, professions and conditions.

There are five main benefits that have been reported, reinforcing the importance of core strength. These benefits are:

- preventing injuries
- reducing the risk of back pain
- protection of inner organs and central nervous system
- improving posture, balance and stability
- improving performance.

#### 1. Prevent Injuries and reduce the risk of back pain:

The four factors associated with the risk of back injury are amount of force, repetition, posture and stress applied to the spinal column. Poor physical condition, poor posture, lack of exercise and excessive body weight contribute to the number and severity of sprains and strains. (Tortora & Derrickson, 2008). A certified Rehabilitation Specialist Dr. Scott Schreiber explains, "The 'core' muscles are the first to be activated with any movement of the body. When producing any movement force is translated from the lower extremities through the core to the upper body. If you have faulty core, this force transfer will be diminished." (Why it is important to strengthen your core, 2015).

In Taekwon-Do it involves a lot of repetition, joint impact, twists and turns. It therefore can put a practitioner at high risk of injury especially depending on the frequency of training and those training for the purpose of competition or for grading. A strong core becomes pertinent in helping you to prevent bodily injury. This is because prolonged or repeated forward bending can over stretch the posterior (back) spinal muscles and ligaments resulting in instability of the disc within its vertebrae joint space. This will cause disc

bulging into the spinal cord and lateral nerve roots which results in pain, weakness and dysfunction. (Favaloro, 2014)

## 2. Protect inner organs and Central Nervous System:

Underlying the anterior core muscles is all the vital organs, major veins and arteries. Therefore the abdominal muscles hold the vital organs in place by regulating internal abdominal pressure. Keeping the core muscles strong will help ensure the vital organs stay protected, through everyday motions. In Taekwon-Do learning how to tense the abdominals to take a blow is important to protect certain vital spots in combat. This is seen in sparring, when a practitioner needs the ability to brace the core for an attack. For a beginner student who have not learnt how to tense the abdomen, common complaints of being winded or pain can delay a fight.

## 3. Posture:

The optimal posture seen on a lateral view is drawing a plumb line that intersects through the mastoid, shoulder, greater trochanter, knee and malleoli. On a posterior view, three straight horizontal lines can be drawn across the mastoids, top of the shoulders and hips, to judge the ideal posture. An optimal posture will lead to a well balanced muscle tone and stability of the postural core muscles. It will ensure a better position of the vertebral disc within its joint space, and minimize nerve pressure and pain throughout the spine and extremities (arms & legs). Slouching is seen in bad posture, which is associated with weak core muscles contributing to an imbalance between the posterior and anterior muscles. Good posture trims the silhouette and projects confidence. More importantly, it lessens wear and tear on the spine and allows the body to breathe deeply. Good posture helps you gain full benefits from the effort you put into exercising, too. (Healthbeat). Every movement from stepping to arm swinging activates the core and for the body to maintain posture in all types of movement requires strengthening the core muscles. All the front, side and back muscles that work together in supporting and stabilizes the spine. (Why it is important to strengthen your core, 2015)

Taekwondo focuses on upright postures which helps improve the students ability to properly transition from position to position with grace and stability, and it helps to improve balance while standing on one foot and executing a kick with the other (Favaloro, 2014). The basic principles of a proper stance are to keep the back straight, with a few exceptions and to tense the abdomen. (McPhail, 2016)

#### 4. Balance and Stability

A strong core also enhances balance and stability. Thus, it can help prevent falls and injuries during sports or other activities. It is the core being strong and flexible that underpins almost every motion performed. The core stabilizes the body, allowing you to move in any direction, even on the bumpiest terrain, or stand in one spot without losing your balance. Viewed this way, core exercises can lessen your risk of falling. (Healthbeat) A weak, tight, or unbalanced core muscles can undermine you in any of these realms.

While it is important to build a strong core, it's unwise to aim all your efforts at developing rippling abs. Overtraining abdominal muscles while snubbing muscles of the back and hip can set you up for injuries and cut athletic prowess. (Healthbeat).

A key element to generating power in performing Taekwon-Do techniques is to understand how equilibrium is essential in stances. When the body is in equilibrium, a blow is more effective and deadly. Therefore a stance should always be stable yet flexible for both offensive and defensive movements. (McPhail, 2016). Balance is a judging criterion in patterns competition and a competition can lose points for a loss of balance. Practitioners also need core strength to have the ability to kick with one leg. A stronger core is one that allows correct balance when executing a kick that can be seen in patterns that step sparring and tested in power breaking.

#### 5. It Improves Performance:



The key to performance is that muscles learn to work together. Deliberately training muscles individually leads to problems especially for athletes who train in the gym building strength for one particular muscle and then trying to apply that to their sport or Taekwon-Do. Taekwon-Do uses a combination of muscles and varieties of their actions. Taekwon-Do is a performance based martial art. From grading to competition a practitioner is called upon to demonstrate the different disciplines that fall under Taekwon-Do. The core needs to be versatile to the different techniques performed. The core has to be able to be flexible to move like in patterns, to be stable like in line work and to be able to brace when being thrown around in self defence. Training of the core develops connection between the brain and the body and allows for activation of the different muscles to contract faster. Also by stabilizing the core it hones the fine motor skills, so the body can react quickly and stay balanced on unstable surfaces." (The Editors of Women's Health, 2013)

### Conclusion:

The core is considered to be the area of the torso to the pelvis. It consists of the external oblique, internal oblique, transversus abdominis and rectus abdominis, erector spinae, multifidus and pelvic floor muscles. These muscles work in combination to help stabilize the spine, generate movement and connect the upper body to the lower body. Each person has a basic level of core strength that allows him or her to perform everyday motions and actions. For a Taekwon-Do practitioner, athlete or for someone wanting to improve their overall health a focus on improving, developing and strengthening the core is vital. Though research is limited, what has been discovered has shown that having a focus of core strength leads to benefits in preventing injuries, reducing the risk of back pain, protection of inner organs and central nervous system, improving posture, balance and stability and improving performance. Each of these benefits can be applied to all aspects of performing Taekwon-Do.

Core strength is important in Taekwon-Do because every action utilizes the core. It will allow practitioner longevity in training and aid in overall health and wellness. The variety of the techniques and the different components allow the core to be

trained in various ways. However having an exercise program outside of Taekwon-Do is beneficial in training core strength further condition the body for optimal performance and to translate into all area of life. More research is needed in how to train and develop core strength particularly in Taekwon-Do and other martial arts. Research into areas the role of core strength plays on injury prevention and a practitioner's ability to continuously train would be useful.

Overall every person is continuously working on core strength through everyday motions. A Taekwon-Do practitioner is however focusing more on core strength and without it would be unable to perform Taekwon-Do as General Choi intended.

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