Key Benefits of Flexibility Training in Sports

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Abstract

Flexibility training is the most overlooked components of conditioning. Despite recent and ongoing debates that are questioning its role in injury prevention, athletes of all fields will still gain a lot from a stretching regime; flexibility of muscles and joints play an essential part in many athletic movements. Flexibility has been defined as the range of motion around a joint and the surrounding muscles during a passive movement. In this context, passive meaning no active muscle involvement being required in order to hold the stretch as it is done naturally, with gravity, or with the assistance of a partner providing force. Risk of injury can be reduced and performance might be enhanced by simply increasing the joint range of motion. The logic behind this is that an extremity can move further before an injury can occur. For instance, tight neck muscles can restrict how far an individual can turn their head. When playing football and being tackled and your head gets forced beyond its range of movement, then it is places strain on the neck muscles and tendons.

KEYWORDS: Range of Motion, Ligaments, Dynamic Stretching, Ballistic Stretching, Isometric Stretching.

Introduction

Flexibility is the amount of movement available at a joint. For example, the amount of movement available at the hip joint is determined by how far the leg can be moved in each of the permitted motions (e.g. flexion - raising the leg up in front). The term flexibility means the same as mobility or suppleness. Flexibility is needed to perform everyday activities with relative ease. To get out of bed, lift children, or sweep the floor, we need flexibility. Flexibility tends to deteriorate with age, often due to a sedentary lifestyle. Without adequate flexibility, daily activities become more difficult to perform. Over time, we create body movements and posture habits that can lead to reduced mobility of joints and compromised body positions. Staying active and stretching regularly help prevent this loss of mobility, which ensures independence as we age. Being flexible significantly reduces the chance of experiencing occasional and chronic back pain.

Objective of the Study: The objective of flexibility training is to improve the range of movement of the antagonistic muscles.
Flexibility is determined by a number of factors:

- Type of joint: The shoulder - a ball and socket joint, is more flexible (or mobile) than the knee - a hinged joint, for example.
- Muscle tissue elasticity: Injured, poorly conditioned, tight muscles are less flexible.
- Elasticity of tendons: Tendons should stretch slightly although not to the extent of muscles.
- Laxity of ligaments: Following injury, ligaments can become lax resulting in excess joint movement. Some people are also born with lax ligaments.
- The ability of a muscle to relax: Some muscles are unable to fully relax due to increased tone - usually postural.
- Temperature of the joint and associated tissues: Joints and muscles offer better flexibility at body temperatures that are 1 to 2 degrees higher than normal.
- Bony structures which limit movement: Some people develop bony growths known as spurs which may limit joint motion.
- Temperature of the environment: Warmth promotes flexibility.
- Time of day: Flexibility is lower first thing in the morning.
- Injuries: Muscles often tighten up to protect an injury, resulting in lower flexibility.
- Age: Flexibility tends to decrease with age.
- Gender: Females are on average more flexible than males.

Flexibility training is perhaps the most undervalued component of conditioning. While recent and ongoing debate questions its role in injury prevention, athletes can still gain much from a stretching regime.

From a volleyball spike to a rugby drop kick, flexibility of the body’s muscles and joints play an integral part in many athletic movements.

In general terms, flexibility has been defined as the range of motion about a joint and its surrounding muscles during a passive movement (1, 2). Passive in this context simply means no active muscle involvement is required to hold the stretch. Instead gravity or a partner provides the force for the stretch.

Importance of Flexibility

Flexibility helps to reduce the risk of injuries by maintaining the body in a state of balance. Our muscles work in pairs to cause movement on a joint. One muscle shortens to move the joint as the other relaxes to stretch and allow the full movement. If one of these muscles is tight, this affects the balance at the joint as the muscle which is contracting cannot do so through its full range and so becomes weaker. Muscle imbalances such as this result in alterations in posture and compensation through altered biomechanics.

A common example of reduces flexibility causing injury is the shoulder joint. If the chest muscles are shortened through frequent slouching at a desk, this pulls the shoulder joint forwards. If the shoulder retractors (i.e. Lower traps and serratus anterior) are not strong
enough to counteract this force, the joint moves forwards, affecting the mechanics of the shoulder and reducing the space in the joint, often resulting in an impingement syndrome.

Similarly, tight calf muscles can be a problem in runners. If the calf muscles are tight the amount of dorsiflexion at the ankle is reduced. To compensate for this, the foot phonates further which causes excess rotation of the lower leg and can contribute to conditions such as Shin splints and Achilles tendonitis.

Being flexible will also help us to perform at our best in our chosen sport. Whilst some sports obviously benefit from flexibility (such as gymnastics, hurdles and high jump), others may not be as clear. However flexibility allows us to perform certain skills such as agility and balance more efficiently, aiding performance and decreasing the risk of injury.

**The Benefits of Flexibility Training**

By increasing this joint range of motion, performance may be enhanced and the risk of injury reduced (3, 4). The rationale for this is that a limb can move further before an injury occurs.

Tight neck muscles for example, may restrict how far you can turn your head. If, during a tackle, your head is forced beyond this range of movement it places strain on the neck muscles and tendons.

Ironically, static stretching just prior an event may actually be detrimental to performance and offer no protection from injury (5, 6). The emphasis is on "may" however, as a closer examination of the scientific literature shows that effects are often minimal and by no means conclusive.

**Muscle tightness**, which has been associated with an increased risk of muscle tears (7, 8), can be reduced before training or competing with dynamic stretching. For this reason many coaches now favor dynamic stretches over static stretches as part of the warm up.

Competitive sport can have quite an unbalancing effect on the body (9, 10). Take racket sports for example. The same arm is used to hit thousands of shots over and over again. One side of the body is placed under different types and levels of stress compared to the other. The same is true for sports like soccer and Australian Rules football where one kicking foot usually predominates. A flexibility training program can help to correct these disparities preventing chronic, over-use injury.

Of course, a more flexible athlete is a more mobile athlete. It allows enhanced movement around the court or field with greater ease and dexterity. Some other benefits may include an increase in body awareness and a promotion of relaxation in the muscle groups stretched - both of which may have positive implications for skill acquisition and performance.
Types of Flexibility and Stretching

1. **Dynamic flexibility** -- the ability to perform dynamic movements within the full range of motion in the joint. Common examples include twisting from side to side or kicking an imaginary ball. Dynamic flexibility is generally more sport-specific than other forms of mobility.

2. **Static Active flexibility** -- this refers to the ability to stretch an antagonist muscle using only the tension in the agonist muscle. An example is holding one leg out in front of you as high as possible. The hamstring (antagonist) is being stretched while the quadriceps and hip flexors (agonists) are holding the leg up.

3. **Static Passive flexibility** -- the ability to hold a stretch using body weight or some other external force. Using the example above, holding your leg out in front of you and resting it on a chair. The quadriceps is not required to hold the extended position.

A flexibility training program can be made up of different types of stretching:

1. Dynamic stretching
2. Ballistic stretching
3. Static Active stretching
4. Static passive stretching
5. Isometric stretching
6. PNF stretching

It depends on the sport and the athlete's outcomes - something which will be examined more closely in the articles below. As a general rule, dynamic stretches are used as part of a warm up and static stretches or PNF flexibility training is used for increasing range of motion.

**Guidelines for Flexibility Training**

- Don’t overdo it; work within your limits.
- Breathe comfortably. Exhale as the muscle lengthens to assist in relaxation.
- Perform flexibility exercises for each muscle group for total-body improvements.
- Work with warm muscles because they lengthen more easily and with less discomfort. The best time to do flexibility training is after the cardio respiratory workout.
• Modify. You can alter the difficulty of a stretch by paying attention to

• Single-joint versus multi joint movements (complexity),

• position of the stretch (whether it involves balance),

• Available ROM (individual limits),

• Length of the lever (longer is more difficult),

• Degree of exercise difficulty,

• chosen stretching technique, and

• Effect of gravity (as an assistance or resistance).

Choose activities that serve two functions: relaxation and flexibility. This does not mean that the entire time has to be spent stretching. There are many methods of flexibility training that promote relaxation, such as yoga, meditation, Pilates, tai chi, visualization, and breathing. Try these alternatives to assist players in relaxing and encourage them to de-stress from their busy lives.

Summary

Some other benefits of flexibility training include an increase in body response and muscle relaxation, both of which may have positive implications on one’s skills and performance. Another benefit of static stretching is that it helps reduce muscle soreness after exercise. This is because it involves a slow, gradual and controlled elongation of the muscle through the full range motion. The basic rule of thumb is to hold the stretch for 15 to 30 seconds in the furthest comfortable position. It also improves posture and muscular balance. One of the benefits that flexibility training offers is that it may restrict how far one can turn the head. If, during a tackle, one’s head is forced beyond its normal range of movement, it stretches and puts stress on the neck muscles and tendon. Ironically, static stretch just prior to an event may be detrimental to performance and offer protection from injury. Muscle tightness can be reduced before training or competing by utilizing dynamic stretching. For these reasons, a coaches’ advice to athletes is to do a few dynamic stretches instead of static stretches during warm ups. Competitive sports may demand quick actions which may lead to unbalanced responses.

References


