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**Aafid Gulam**  
Physical Training Instructor  
(PTI) Govt. Degree Collage  
Ramban 182144 (J&K), India.

## A Study and analysis of the impact of stretching exercises on the flexibility of football players

**Aafid Gulam**

### Abstract

This paper aims to examine the fact that good flexibility is known to bring positive benefits in the muscle and joints. It aids with injury prevention help to minimize muscle soreness and improves efficiency in all physical activities. Increasing flexibility can also improve quality of life and functional independence. Studies comparing the effectiveness of the various stretching techniques have been confusing and contradictory. However majority of the information in this paper tends to support the use of stretching exercises for providing the best improvements in flexibility. Therefore, it is important that football players should adopt the habit of stretching exercises in their daily routine to increase flexibility, improve blood circulation, decrease pain, and give greater sense of satisfaction and wellbeing.

**Keywords:** Stretching exercises, Flexibility, Physical fitness, Football players

### 1. Introduction

The advancement in science and technology has dramatically reduced the amount of daily movement and activities. As a result we have become a "chair born" - working most of the time at a desk, which makes us relatively inactive. We are constantly in a seated, forward-flexed position which means we are chronically in poor posture. Over time, this creates a problem with the entire body. About 90% of the population in India experience low back pain at some point in their lives. Many people suffer from aches and pains brought on by sedentary lifestyle as long hours sitting at a desk in office. When people work at a computer sitting for long hours there is a chance that they may eventually suffer from carpal tunnel syndrome, along with back pain, stiff muscles, tight joints, tension and stress. Carpal Tunnel may begin as a mere tingling or weakness in the wrist, hands and forearms as symptoms. This may be caused in part by repetitive motions of joints as required in a job or at home. On the other hand, when joints remain immobile for an extended time, the muscles that surround the joint become tight and do not slide as easily upon one another to produce movement. Eventually, changes occur at the cellular level. The musculoskeletal components of the joint can actually lose their ability to stretch and become permanently shortened. After a long day sitting at desk in office, for example, you may feel difficult to stand on your legs. This is because, muscles around joints become stiff. This will gradually weaken your knees as a result you may develop knee problems. Most individuals will either have knee discomfort underneath the knee or discomfort on the side of the leg/knee. Most knee pain is the result of sedentary lifestyle (8-10 hours of sitting or inactivity), muscle imbalances, and lack of rest or overuse. There are other possible factors such as flat feet, posture, age, type of shoes, etc. Generally, people who sit all day will have tight hamstrings, hip flexors, calf muscles, weak gluteus (buttocks) and underactive inner thigh muscles. When you have tight muscles, its primary functional movement might be altered. For example, tight hamstrings and tight lower back usually signal a weak gluteus muscle. The weak gluteus (buttocks) muscle function of being an extensor muscle is dominated by the hamstring and lower back. This will limit the range of hip joint movement and affect the joints above and below: spine, shoulder blades, and also the knee. Tight calf muscles may alter your ankle mobility. The shin muscles will be unable to perform its primary role because its' opposing muscle the calf is overpowering it via its tightness. Many people get shin splints and plantar fasciitis because

**Correspondence:**  
**Aafid Gulam**  
Physical Training Instructor  
(PTI) Govt. Degree Collage  
Ramban 182144 (J&K), India.

of tight calf muscles and weak shin muscles. It is important to note that no muscle works independently. If you have tight muscles its' opposing muscles are usually weak and needs to be strengthen. Remember, when muscles around joints become tight your joints range of motion (ROM) is affected which may travel throughout your posture.

### 1.1 Stretching

Stretching is the most important part of any workout of physical co-activity. Regular routine of stretching can help to prevent injuries, promote flexibility and strength. When the muscles are stretched, it can help joints to keep them moving freely. The most common form of stretching is resistance stretching, an example is a calf stretch, in which the user usually lifts the ball of foot in to a raised platform, and drops the heel. Most of the stretching is done before and after exercise, as it is one of the simplest and safest ways to stretch without over stretching muscles. Stretching, as it relates to physical health and fitness, is the process of placing particular part of the body into a position that will lengthen, or elongate, the muscle and associate soft tissues. Upon undertaking a regular stretching program a number of changes begin to occur within the body and specifically within the muscles themselves. Other tissues that begin to adapt to the stretching process include the fascia, tendons ligaments, skin and scar tissue.

Doing stretches is a vital part of every physical exercise and should be an important part of any normal day. It promotes a healthy range of motion and prevents muscles from tearing for straining under normal conditions as well as in the event of a sudden movement. It increases oxygen movement through the body as well as flow of blood. It can also help the body to feel healthier and stronger with minimal effort. Stretching is a form of physical exercise in which a specific skeletal muscle (or muscle group) is deliberately elongated often by abduction from the torso. The result is a feeling of increased muscle control, flexibility and range of motion. Increasing flexibility through stretching is one of the basic concepts of physical fitness. It is common for athletes to stretch before and after exercise in order to reduce injury and increase performance. Yoga involves the stretching of major muscle groups, some of which require a high level of flexibility to perform, for example the lotus position. In yoga stretching can strengthen muscles, and in turn strong muscles are important to stretch safely and effectively. Stretching can be dangerous when performed incorrectly. There are many techniques for stretching in general, but depending on which muscle group is being stretched. Some techniques may be ineffective or detrimental, even to the point of causing permanent damage to the tendons, ligaments and muscle fiber. The physiological nature of stretching and theories about the effect of various techniques are therefore subject to heavy inquiry.

### 1.2 Types of Stretching

In general any movement that is required to make a body part to the point at which there is an increase in the movement of joint can be called as stretching exercise. Stretching can be done either actively and passively. Active stretching occurs when the person doing the stretch is the one holding the body part in the stretch position. Passive stretching occurs when someone else move the person to the stretch position and hold the person. The Four major types of stretches are ballistic, dynamic, static, and proprioceptive neuromuscular

facilitation (PNF).

### 1.3 Ballistic Stretching

This is defined as, rapid lengthening (stretching) of a muscle by the use of jerking or bouncing movements, for example, bouncing down to touch your toes. This type of stretching is not recommended. In fact, it mimics the type of sudden stress that produces muscle injuries in the first place. Jerking a muscle into a full stretch causes it to lengthen beyond a safe stretch and may injure the muscle...exactly the opposite of what you are trying to achieve with stretching. Ballistic stretching is an outdated form of stretching that uses momentum enumerated by rapid swinging, bouncing and rebounding movement to force a body part to pass its normal range of movements.

### 1.4 Static Stretching

Static stretching is performed by placing the body in to a position where by the muscle (or group of muscle) to be stretched is under tension. Both the agonist and antagonist muscles to be stretched are relaxed. Then slowly and cautiously the body is moved to increase the tension of muscle being stretch. A minimum hold time of about 20 second is required for the muscle to relax and start to lengthen, while diminishing returns are experienced after 45 to 60 seconds. This type of stretching is characterized by a slow and sustained (e.g., for 15-60 seconds) lengthening of a muscle by the athlete without help from a partner. This is one of the best types of stretching because it does not pose the risk of injury to muscle and connective tissue as ballistic stretching does.

### 1.5 Dynamic Stretching

Unlike ballistic stretching, dynamic stretching uses a controlled, soft bounces or swinging motion to move a particular body part to the limit of its range of movement. The force of bounce or swing is gradually increased, but should never become radical uncontrolled. Dynamic stretching is slow, gentle and very purposeful. Dynamic stretching incorporates movements that mimic a specific sport or exercise in an exaggerated yet controlled manner; often include during the warm-up or in preparation for a sports event. Proprioceptive Neuromuscular Facilitation (PNF) Stretching:

PNF stretching sounds more complicated than it really is. Technically, PNF stretching involves passive muscle lengthening with the use of a partner after an antagonistic muscle is contracted. PNF stretching is considered to be an excellent technique however the risk of injury is slightly greater than the other methods since the range of the stretch can be greater.

Stretching To Improve Flexibility:

One of the benefits of stretching is that it does improve flexibility. Stretching, combined with warming up, has been shown to increase the flexibility of the ankle, hip, and knee joints. However, an improvement in flexibility does not automatically mean fewer injuries or improved athletic performance. This is where there is confusion in the literature. The goal of all the stretching techniques is to arrange the motion of a joint by increasing the flexibility of targeted muscle group around the joints. Flexibility is extended to which a muscle can be lengthened by a given amount of force in practice as change in flexibility is measured as a change in a range of motion, so the two terms,

flexibility and range of motion are usually considered synonyms. For example, improving the flexibility of muscle at the back of legs can increase the range of motion of the joint of the spine so as to allow greater trunk flexion, i.e. the ability to bend the trunk forward. All types of stretching achieve greater range of motion around each of the major joints, but there is no clear evidence that any one technique renders superior flexibility.

For a stretching exercise and to improve flexibility, there is need to target the specific joint and provide enough stretch to the muscle over the time to allow an adoption to a new increased range of motion. Basically, what this means is that when you stretch, you need to feel the tightness and slight burning sensation that come from going slightly beyond your new range of motion. By doing so, you will develop new range of motion over the time. It is important to avoid over-stretching the muscle as it may cause an injury or muscle strain. The important recommendation in this direction is to stretch to the point of mild discomfort, but not to the point of pain. In order to develop long term improvements in flexibility we need to stretch every day for at least six weeks. Keep in mind that when you stop using or stretching flexibility, you are likely to lose the gains you made.

### 1.6 Benefits of stretching

The main benefits of stretching are range of motion and an improved flow of blood to the muscles. Some experts also suggest that stretching helps in avoiding muscle injuries, but research has put this claim in to doubt. Stretching may also have the potential to reduce muscle aches, and some people use stretching as a way to calm their nerves or relax their bodies. Improving range of motion is one of the more well-known benefits of stretching. As people grow older, they often lose their ability to move their joints fully. Stretching can help to fight against this tendency; at the same time it can potentially help older people to maintain their mobility.

### 1.7 Following are the Several Training Benefits for Using Stretching Program.

It enhances physical fitness.

It increases mental and physical relaxation.

It enhances development of body awareness.

It reduces risk of injury to joints, muscles and tendons.

It reduces Muscular soreness.

It reduces muscular tension.

It stimulates the production of chemicals which lubricate connective tissues.

It reduces severity of painful menstruation in females.

It improves range of motion in joints, giving you better balance and less prone to falls as you age.

It improves your circulation by increasing blood flow to your muscles, which helps you to recover after day long work.

It promotes better posture by keeping your muscles tone up.

It helps to feel much younger & energetic.

It improves body's absorption of nutrients.

## 2. Flexibility

Flexibility is the range of motion possible around a specific joint or series of articulations. Flexibility is specific to a given joint or movement. A person may not be able to function normally if a joint lacks normal movement. The ability to move a joint through an adequate range of movement is important for daily activities in general as well as sports performance. For example, a sprinter may be handicapped by tight, inelastic hamstring muscles since the

ability to flex the hip joint will be limited, thus shortening stride length. Activities such as gymnastics, diving, karate, and yoga require improved flexibility or even the ability to hyperextend some joints for superior performance. On the other hand, most leisure or recreational activities require only normal amounts of flexibility. The idea that good flexibility is essential for successful performance is based on anecdotal rather than scientific evidence. Adequate range of movement may be more important for long term injury prevention. Individuals involved with physical activity that have poor flexibility (specific or general) risks exceeding the extensibility limits of the musculoskeletal unit. Once flexibility is assessed and flexibility insufficiency is identified, a stretching program can be customized, emphasizing those areas in need of improvement. Flexibility refers to the ability to move joints through their entire range of motion, from a flexed to an extended position. The flexibility of a joint depends on many factors including the length and suppleness of the muscles and ligaments and the shape of the bones and cartilage that form the joint. Flexibility can be genetic, but it can also be developed by stretching. Flexibility is an important component of fitness and exercise tends to increase the amount of flexibility in a joint. Flexibility is also specific to the type of movement needed for sports so it is more important for some sports that other cyclists, for example, require less hip flexibility than hurdles, and swimmers need more shoulder flexibility than runners.

Can you increase Flexibility? Improving flexibility is done mainly by performing stretching exercise. The most common forms of stretching exercise are slow and controlled. Static stretches are thought to be for most people. They involve a slow, gentle stretch if the muscle that is help in a lengthened position for 10 to 60 second and repeated about three times. Flexibility is commonly described as the range of motion, or movement, around a particular joint or set of joint or in Layman's terms, how far we can reach, bend or turn. When improving flexibility is the goal, the muscle and their fascid (sheath) should be the major focus of flexibility training. While bones, joints, Ligaments, tendons and skin do contribute to overall flexibility, we have limited control over these factors.

### 2.1 Two Types of Flexibility

Static flexibility: Static flexibility is sometime referred to as passive flexibility. The term static flexibility refers to an individual's absolute range of motion that can be achieved without movement.

Dynamic flexibility: dynamic flexibility is sometimes referred to as ballistic or functional flexibility. Dynamic flexibility refers to an individual's absolute range of motion that can be achieved with movement in other words, how far we can reach, bend or turn by using velocity to achieve maximum range of motion.

Range of motion (ROM), or range of movement, is no intimately related to flexibility that the term is often considered having the same meaning. That is, that all describe the extent to which a joint can go in its established spectrum of movements. A joint normal range of motion is determined by what that joint does and how far the bones that comprises it can move. So range of motion also measures the current amount of motion around a joint as determined by the condition of the bones the soft tissue surrounding the joint that hold it together.

The study is delimited to 20 men’s football players with age under 25 years. The studies further delimited to the stretching on flexibility of football players.

Objective of the Study is to measure effect of stretching exercises on flexibility of players.

Hypothesis, the study may help the young Football players to improve their flexibility.

**3. Methodology**

In this chapter, the procedure adopted for selection of subjects, selection of variables, experimental design and the administration of tests have been described. Source of data sample for the present study was 20 Men’s player of football who participated in inter-collegiate tournament of university of Kashmir, Srinagar.

Sampling Method:

Subjects were chosen from different colleges and colleges were chosen with the random sampling method.

Collection of data

The group practiced the selected stretching exercises in the University of Kashmir. The players reported in their playing. The practice session was conducted for a period of 20 minutes in the evening i.e. from 4.00pm to 4.20 pm. on daily day continues for the duration of 4 weeks. The stretching exercise was taught and the practice session were conducted and supervised by researcher himself. For teaching purpose, every exercise were explained and demonstrated before the students performed the same. Necessary corrections were made. The rest of instructions were given in between succeeding exercise. All the exercises were done only in one session.

Procedure for stretching exercise

Each stretch should be held for 20-30 seconds and should be repeated at least twice (preferably three times). So for example, you wouldn't perform a calf stretch, then a hamstring stretch then a quad stretch etc., and then repeat the whole routine. Instead you would perform 3 calf stretches, then 3 hamstring stretches and so on. Don't perform a soccer stretching routine designed to increase flexibility at the start of a training session or a game. Some studies suggest it can decrease power and hinder performance.

Here are some other general, but important guidelines to bear in mind before you start your soccer stretching routine. Do not hold a stretch that is in anyway painful. It should feel tight and that tightness should diminish as you hold the stretch.

Breathe! Avoid breathing holding as you stretch as this can raise blood pressure and leave you feeling dizzy.

For optimal results try to stretch every day or at least 3-4 times a week

Makes sure your body is completely warm before you start. Either do 5-10mins of light aerobic exercise or do your stretches at the end of a training session.

Hold each stretch for 20-30 seconds. "Shake out" the limb and joint and repeat for a total of 2 to 3 sets.

Don't expect results overnight. It can take up to 6 weeks to see measurable improvements. Be persistent - they will come.

Sit & Reach Test to Measure Flexibility

This Test is used to measure the flexibility of the lower back and leg (Hamstring) muscle. It is a kind of absolute and linear test of flexibility.

Equipment

Sit and reach box (or alternatively a ruler can be used, and a step or box).

**3.1 Procedure**

The subject is asked to remove shoes and place his feet against the testing box while sloshing on the floor with straight knees. Now the subject is asked to place one hand on top of the other so that the middle fingers of both hands are together at some length. The tester keeps his hand on the knees. The subject is instructed to lean forward and place his hands over the measuring scale as far as possible without bouncing and to hold the farthest position for at least one second. Score each subject is given three trials and highest score nearest to one inch is recorded.

**3.2 Analysis of the Data and Result of the Study**

In this chapter on the basis of data analysis was made by applying appropriate statistical technique and on the basis of analysis of data result of the study was drawn.

Formula

$$\text{Mean}(M) = \frac{\sum x}{N}$$

$$\text{Standard Deviation (SD)} = \sqrt{\frac{\sum x^2}{N}}$$

$$\text{Mean difference(MD)} = \text{Mean1} - \text{Mean2}$$

$$\text{Standard Error (SE)} = \sqrt{\frac{(S.D1)^2}{N} + \frac{(S.D2)^2}{N}}$$

$$\text{'t' Ratio} = \frac{\text{Mean Difference}}{\text{Standard Error}}$$

**Table 1:** Showing the table of Mean, S.D., M.D., S.E. t, ratio for Sit and reach Test

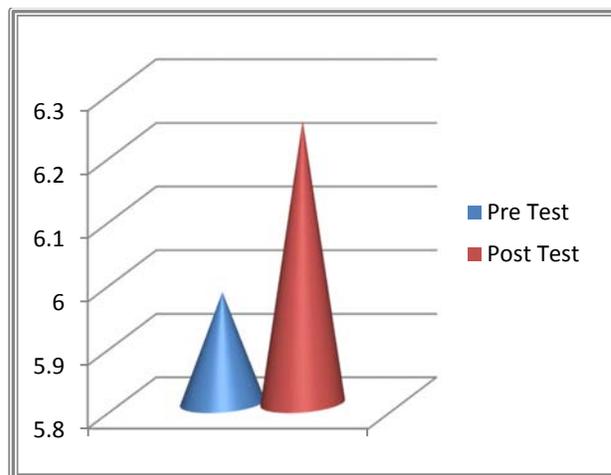
	M	SD	MD	SE	't' Ratio
Pre Test	5.975	1.46	-0.27	0.46	-0.58
Post Test	6.245	1.50			

According to the Table No. 1 Pre Test Score of experimental group were 5.975 the Post test score of experimental group were 6.245 at the conclusion of four weeks of experimental period.

The “t” Ratio is case of experimental group were -0.58 which is not significant at -0.58 level of confidence.

Graph No. 1

Showing the Graph of Mean for Sit and reach Test



#### 4. Conclusion

In the Light of results of this study following conclusion were drawn. The soccer stretching exercises will not only increase flexibility, but also have a positive effect on ability to perform ball skills and agility around the pitch. A good range of motion helps to perform fine motor skills with greater poise, elegance and consistency. It also improves agility aiding in quick changes in direction and speed off the mark. But to gain the benefits from a soccer stretching program the player must make more than a token effort at the end of a cool down.

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