

**REVIEW ARTICLE ON FLEXIBILITY OF JOINTS & ITS IMPORTANCE IN PHYSICAL FITNESS****Suvarna Kakirwar\*<sup>1</sup> and Dr. Umesh Lunawat<sup>2</sup>**<sup>1</sup>Associate Professor, Sharir Rachana Department, Jupiter Ayurved Medical College, Nagpur, Maharashtra, India.<sup>2</sup>Associate Professor and HOD, Streerog Presautitantra Dept, Jupiter Ayurved Medical College, Nagpur.**\*Corresponding Author: Suvarna Kakirwar**

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**ABSTRACT**

Flexibility is one of the essential component of physical fitness. In general flexibility means the range movement around the skeletal joint of the body. For a good physical fitness, it is essential that person has quiet flexible joint & is able to maintain his or her body flexibility. Flexibility is the range of motion around joint as determined by the elasticity of the muscles, tendons & ligaments associated with joint under consideration. In order to maintain the natural flexibility of the joints & reduce the risk of injury in, the training program should always contain suitable & correctly executed flexibility exercises. A muscle that is trained for strength becomes shorter. This in turn means that its range of movement is restricted which in practice decreases its ability to utilize its increase force resources correctly. Exercises that are design to train the strength of group of muscles, should always be followed by stretching exercises for the same muscle group. Various Asanas in YogShastra (Branch of Ayurveda) are very useful for stretching. Yoga makes our mind stable and creative & maintains our physical fitness & makes the person energetic.

**KEYWORDS:** Flexibility, joint, physical fitness, Stretching.**INTRODUCTION**

Flexibility is one of the essential components of physical fitness. Flexibility is not a general body character but it is a specific to each body region. If a person has highly flexible shoulder joint, it does not necessarily mean that he/she will have good knee flexibility or hip flexibility.

The flexibility component of physical fitness enables the person to have free body movements, better coordinated movements requiring lesser work & to handle greater stress with lesser chances of injury.

Flexibility has been defined as the range of motion at a single joint or a series of joints & reflects the ability of muscle tendon units to elongate within the physical restrictions of the joints.

It is the ability of a person to move the part of a body through a wide range of motion as possible without undue strain to the joint and its muscle attachments.

Body flexibility is affected by many factors. Some important of these factors include age, sex, life style, injuries, physique, body composition & exercise training, The effects of above factors are.

Age:- Flexibility changes considerably with changing age. Young children are more flexible than adults.

Sex:- Generally speaking males are less flexible than females.

Lifestyle:- Flexibility is greatly affected by one's life style. Active life style maintains one's flexibility while inactive life style gradually reduces one's flexibility.

Injuries:- Injuries are also greatly responsible in reducing flexibility of the injured joints.

Physique and Body composition:- Person having greater percentage of body fat have lesser flexibility than person having greater percentage of lean body mass.

Exercise Training:- This is the most effective factor in improving flexibility, component of one's physical fitness. In other words, flexibility component is improved more rapidly & retained longer as compared to other fitness components. Training of stretching exercise continued for two to three weeks increases ones flexibility of the concerned joint. The increased flexibility is retained for fifteen weeks with little efforts. However if one adopts regular flexibility exercise habits, the increase range of joint movements caused with stretching exercise may be retained indefinitely i.e. permanently.

Certain pathologies or injuries also may limit the range of motion at the affected joint. Scar tissues in particular is less compliant than undamaged tissue. Immobilization of joints when the muscle is in a shortened position is often necessary for many joints, ligaments & musculotendinous injuries. It has been shown that adaptive shortening of the muscle tendon unit can occur & could affect the available range of motion at a joint.

### Flexibility in fitness & sport

A review of the literature indicates that flexibility is one of interest areas to coaches, physical educators, sports scientists & rehabilitation therapists. Generally they agree that flexibility is important to athletic performance. Recently a more rigorous scientific approach to the area of flexibility has been taken by researchers who have directed efforts towards developing & validating improved static flexibility measurement procedures & addressed questions related to the importance of flexibility to sports & the appropriateness of training.

For sports like Gymnastics, figure skating and diving the participants have to move through large ranges of motion at many joints. The athlete must train to reach these ranges for the specific joints & joint movements. Thus flexibility training is very important in these sports.

### Structure and physiological determinants of flexibility

Several factors influence the range of motion at a joint. The structure of the joint and interspace between the two articulating surfaces can prevent excessive ranges of motion at different joint.

For example:- elbow joint (humeroulnar articulation) can move through a large angular displacement but the movement is restricted to flexion & extension in the sagittal plane & extension is limited by the bony structure of the olecranon process & groove.

The soft tissue surrounding the joint (muscles, tendons, fascia, ligaments & skin) also restrict joint motion. The skin has a minimal effect on restricting range of motion unless the pathology is present. The ligaments & joint capsule provide the joint with a degree of stability & are not usually the focus of exercise aimed at improving flexibility. The major focus of stretching exercise is usually on the elongation of the muscle tendon unit. It is this ability of muscle tendon unit to elongate within the physical restrictions of the joint that is important to flexibility.

If the external force applied to the muscle is too high, it resulted in damage to the muscle tendon unit. An important consideration for developing & improving training techniques & measurement procedures for flexibility is that various factors can affect the length of the muscle tendon unit. The techniques that aim to increase the temperature of the muscle tendon unit appears to be most effective for increasing range of motion.

### Testing methods commonly used

Flexibility can measure by indirect method & direct method.

#### Indirect Method

Current test for minimal level of flexibility

- 1) Floor touch
- 2) Trunk forward bend
- 3) Trunk extension

Wells and Dillon Test

- 1) Standing bobbing
- 2) Sit and reach

#### Direct Method

The direct methods utilized for assessing flexibility measure angular displacements between adjacent segments or from an external reference.

- 1) By Goniometer
- 2) By Flexometer

### Flexibility training (stretching)

We have seen that range of motion can be limited by both inert structures and by the contractile portion of the muscle. Muscle reflexes are important. When trying to stretch muscle, an adequate warm-up is needed. It make the tissues more pliable before we stretch. Following a warm-up the body should be kept warm throughout the stretching period. For warm-up loose fitting clothing such as jog bottoms and sweat shirt are useful.

In ayurveda we have yogashastra to develop the flexibility. Our ancient yogashastra has developed different techniques for physical fitness & mind stability with which the athlete or sport person or normal person can achieve a very good degree of flexibility. Different asanas are helpful in increasing flexibility at various age. One can start it at any age and have his/her increase flexibility.

Yoga can be used to address both, the physical & energetic systems of the body to bring the body's metabolism & energy back into balance.

### DISCUSSION AND CONCLUSION

As we say that flexibility is important for physical fitness, mainly in sports. However a logical basic supports the importance of flexibility. The basic assumption that a degree of flexibility is necessary for physical fitness & for athletes. Therefore flexibility is useful in obtaining quantitative volves that could help to assess improvements and to identify problem areas associated with poor performance or possible injury.

To improve flexibility stretching has been considered an effective method. It also helps in preventing injuries to muscles, ligaments & tendons. Stretching warms deep muscle fibers, warms joint fluids, lubricants. It increase respiratory rate (depending on the type of warm up),

elevates heart rate & therefore increases volume of blood flow.

In our Ayurved Shastra Stretching is nothing but doing various Asanas. Various Yoga Posture i.e. Asanas enables the person, athlete to have free joint/body movements, better coordinated movements & thus increases flexibility of that particular joint.

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