

PHYSICAL EDUCATION



TRAINING IN SPORTS

Training in sports:

Training in sports is very important to improve the performance of a player. Training should be specific, systematic, and scientifically based.

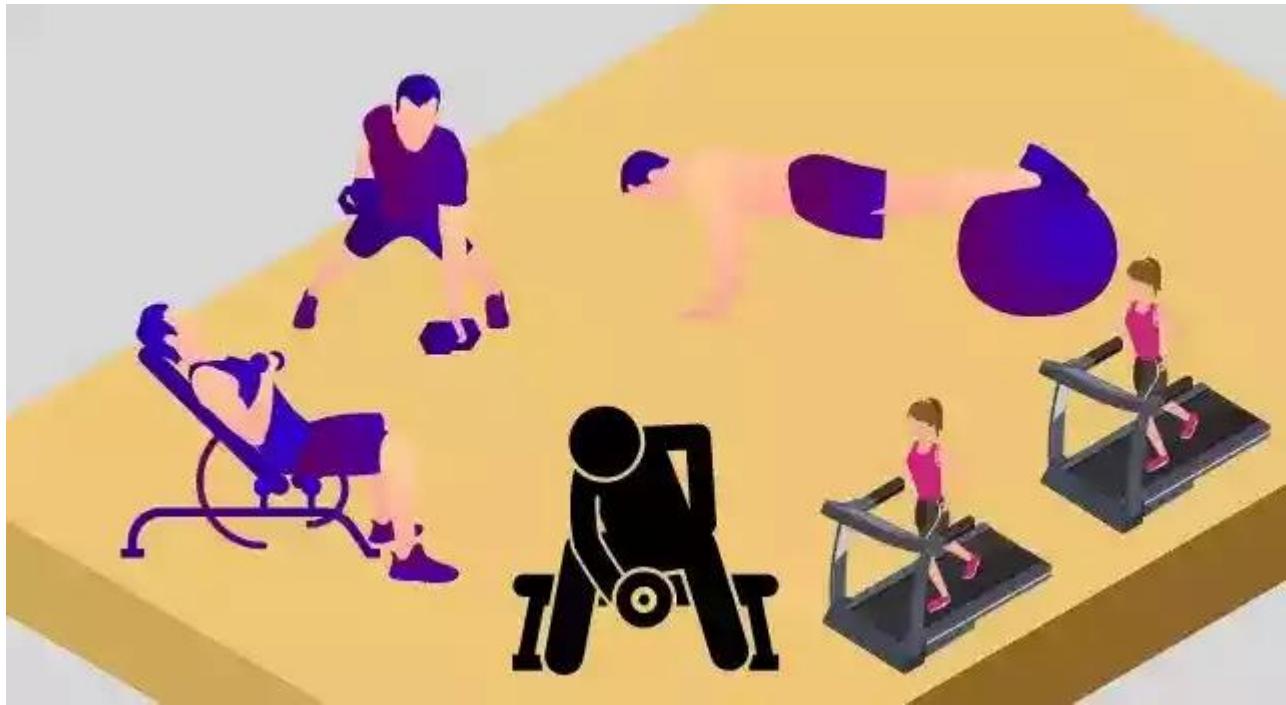
Each activity required specific types of physical fitness components and training methods are required to develop that component.

There are five Physical fitness components, all are related to each other.

- Strength
- Speed
- Endurance
- Flexibility
- Coordination

Strength

To achieve the ultimate aim there are many objectives which are as follow:



Strength is the ability of a muscle to overcome resistance. It is the total amount of force a muscle can exert.

Different sports require different levels and types of strength, which can be improved through specific training. Strength can be measured in pounds or Dynes.

Types of strength

- **Static Strength:** It is the ability to act against resistance from one position without any movement, e.g., arm wrestling, powerlifting, wall pushing. It is also known as isometric Strength.
- **Dynamic Strength:** It is the ability to act against resistance with movement. Movements are visible when someone is doing dynamic strength training. It is divided into three parts.
- **Maximum Strength:** It is the ability to act against maximum resistant. It is required in weightlifting, throwing, wrestling, etc.
- **Explosive Strength:** It is the ability to overcome resistance with high speed. It is the ability to forceful movement at a quickest possible time. It is generally required in jumping activities. This Strength can be measured by Dynamometer.
- **Strength Endurance:** It is the ability to overcome resistance for a longer period under conditions of fatigue. This quality enables a person to sustain his working muscle group for an extended period.

Methods To Improve Strength

In knock out tournament only winning teams continue to play further and teams once get defeated, automatically get eliminated.

Isotonic Exercises

While doing exercises tension creates in working muscles and there is a change in length. Muscles get shortened and lengthened.

Isotonic exercises tone up the muscle. Muscles become flexible. Activities like Jumping, running, Weightlifting are some examples of isotonic exercises.

Isotonic Exercises are of two types

- **Concentric:** It is the upward movement of action in which flexor muscles shortens and extensor muscle lengthens in size.
- **Eccentric:** It is the downward movement of action in which flexor muscles lengthen and extensor muscles shorten in length.

Isometric Exercises

In these Strength training exercises; the length of muscles remains the same during workouts.

These exercises have no external movement, but the tension created inside the muscle.

In these exercises, flexor and extensor muscles feel tremendous pressure but there is no movement. Examples of these exercises are pushing the wall, lifting heavy weights, pulling the rope in a tug of war, arm wrestling, etc.

Isokinetic Exercises

In these exercises, there is a movement with continuous tension in both flexor and extensor muscles. In this muscles contract throughout the range of movement at a constant speed.

Both flexor and extensor muscles contract simultaneously, as a result, both develop, thus it takes less time to build muscle.

Endurance



Endurance is the ability to sustain or continue the activity. In other words, it is the ability to resist fatigue for a longer period.

Endurance is required for almost all major sports. It is one of the important components for middle and long-distance races, football, hockey, basketball, handball, etc.

Types of Endurance

Muscular Endurance/ Short Term Endurance.

Speed Endurance

This is the type of endurance in which the activity is done with high speed and intensity. This endurance is for a shorter duration (from 30 to 60 sec) with 80% to 90% of top speed ability.

This type of Endurance is required in medium distance races, swimming, basketball, tennis, badminton, etc.

Strength Endurance

This type of activity is done powerfully and forcefully for a shorter duration. This duration is from 2 to 3 minutes. Strength endurance is generally performed in absence of oxygen. It is required in wrestling, boxing, Judo, etc.

Long term Endurance

This type of Endurance is required when the activity is done for a longer duration and the intensity or speed is slow. It delays fatigue, it is required for long-distance running, cycling, cross country, marathon, football, etc.

Methods To Improve Endurance

Continuous Training Method

It is one of the best methods for improving endurance. In this method, Athletes perform running for long periods without taking rest in between.

In this method, speed remains slow because the exercise is done for a longer period. This method develops a very high level of Endurance.

This method has three types:

- i. **Slow Continuous Training Method:** This method is used by long-distance runners. Duration of workout is 1 – 2 hours, distance covered is 10 – 20km
- ii. **Fast Continuous Training Method:** This method is used by middle-distance runners. Duration of workout is 15 – 40 minutes, distance covered is 5 – 10km
- iii. **Variable Continuous Training Method:** This method is a combination of fast and slow pace continuous methods. Here the workout is done with a variable speed of 40-100 percent of the best capacity.

Advantages of Continuous Training Method

- Increases glycogen in muscle.
- Increases number and size of mitochondria.
- Increases efficiency of heart and lungs.
- Improves willpower and confidence.

Interval Training Method

In this method, the principle of effort and incomplete recovery is followed. It is special

endurance training that involves high-intensity workouts followed by incomplete rest.

This method is the best method for endurance development. The Interval training method is based upon the scientific principles where the load is controlled through various factors to provide incomplete recovery.

- Volume or total distance.
- Intensity or speed of work.
- Duration of workout.
- Number of repetition.
- Duration of rest.
- Mode of recovery.

In this training method, the total workout is done in small parts, where incomplete rest is given between each workout.

Workout – Rest – Workout – Rest

The load can be increased by increasing the workout or by reducing recovery

Fartlek Training Method



Fartlek means speed play. It is a combination of continuous and interval training methods. In this method, an Athlete used a natural environment for a workout.

In this method, speed is not pre-planned. He/she can change speed according to the surroundings (hills, river, forest, muddy road, etc). Athletes are made free to choose their path. He may take a rest in between, run fast or slow.

The only thing to keep in mind, that he needs to reach the finishing point in the desired time.

Advantages of Fartlek Training Method:

- It can practice in off season period.
- It develops creativity and gives adventure.
- Natural motivation is there with no boredom.
- Art of self-learning is experienced.

Speed

Speed is the ability to perform the movement at a faster rate. Speed depends on heredity but can be developed through proper training.

It is the capacity of moving a body with the greatest possible velocity.

Types of Speed:

- **Reaction Time:** It is the time taken by the body to respond immediately after the stimulus. It is the first reaction to bring our body into action.
- **Acceleration Ability:** It is the time taken by the body to reach maximum speed. This ability depends upon explosive strength, technique, and flexibility.
- **Speed of Movement:** It is the time taken by the body to perform complete action.
- **Locomotor ability:** It is the ability to maintain maximum speed for maximum distance.
- **Speed endurance:** It is the ability to perform movements with high speed under conditions of fatigue.

Methods To Improve Speed

Acceleration Run

In this method, Athletes try to attain top speed as fast as possible. They run for 20 – 30-meter distance with maximum speed.

This is repeated 5 to 10 times with a sufficient rest period.

The first few strides should be shorter and the frequencies of steps are very fast.

Pace Run Training Method

Pace races mean running the whole distance of a race at a constant speed. For 800m training athletes can run a distance of 300m or 20% of racing distance at full speed.

Flexibility

Flexibility is when the joints can move to their maximum range. It is the ability to execute movement with greater range.

It is affected by muscle length, adjoin ligaments, tendons. Flexibility helps in preventing injuries, Improving Posture, making the joint healthy, Improving balance.

Types of Flexibility

- **Passive Flexibility:** Joints can move in maximum range with external help, e.g., stretching with a partner.
- **Active Flexibility:** It is performed without external help Active flexibility is further divided into two parts.
- **Static Flexibility:** It is the flexibility performed from a stationary position. e.g., Chakrasana, toe touching.
- **Dynamic Flexibility:** It is the flexibility performed while in motion. This is required for gymnastics, diving, etc.

Methods To Improve Flexibility

- **Ballistic Method:** In this method, individuals perform various stretching exercises while in motion. In this stretching the muscle with help of swinging the limbs.
- **Static Stretching Method:** In this method, various slow stretching exercises are done from a stationary position and hold the final position for sometimes.
- **Passive Flexibility Method:** In this method flexibility exercises are done with external help. Such as partner help, stretch ropes, bid role ball, bar stand, etc.
- **Proprioceptive Neuromuscular Facilitation Techniques (PNF):** This technique is used by advanced athletes for gaining flexibility. Here you move into a stretch position then your partner holds the limb in this position.

Coordinative Ability

Coordinative Ability is the ability of the body to perform the movement with perfection and efficiency. It is the ability to execute a sequence of movements smoothly and accurately.

Coordination is required for qualitative movement. It is the proper combination of strength, speed, endurance, and flexibility during movement.

Types of Coordination

- **Adaptive Ability:** Ability to adjust the movement effectively based on changes.
- **Balance Ability:** Ability to protect the body in a stable position.

- **Rhythm Ability:** Ability to observe the rhythm of a movement and to regain balance quickly.
- **Reaction Ability:** Ability to react immediately and quickly to a signal.
- **Coupling Ability:** Ability to combine the movements of different body parts for performing a perfect sports movement.