

## **EFFECTIVENESS OF KINESIO TAPING ALONG WITH STRENGTHENING EXERCISES ON PAIN AND ANKLE STABILITY AMONG SOCCER PLAYERS FOR GRADE 2 LATERAL ANKLE SPRAIN**

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### **ABSTRACT**

**Background of the Study:** Ankle sprain is the common musculo skeletal injury in sports. It is due to inversion of a supinated plantar flexed foot. When roll, twist or turn the ankle leads to stretch or tear the ligament. It is caused by falls (ankle twist) poor landing during jumping, playing.

**Objectives:** The study's primary objective was to find out the effectiveness of multiple therapeutic interventions consisting of kinesio taping and strengthening exercises on lateral ankle sprain subjects.

**Subjects and Methods:** A Pre-test and post-test simple experimental study design was used. A criteria-based convenient sampling was used to recruit patients (N=15) diagnosed with lateral ankle sprain. A single group was exposed to kinesio taping and strengthening exercises for the period of 8 weeks. The effectiveness of treatment was measured through Foot and Ankle Disability Index Scale and Sports Module and visual analog scale. The paired 't' test was employed to study treatment effectiveness. A p-value  $\leq$  0.05 was considered significant.

**Result:** The group which was exposed to the treatment of kinesio taping and strengthening exercises showed a better reduction of pain (Pre and post-test mean difference 5.5 and 1.86) in the VAS and improvement in functional performance (pre and post test mean difference 41.7 and 85.0) in the Foot and Ankle disability index scale and sports module in soccer players with lateral ankle sprain. So the kinesio taping and strengthening exercises at 0.05 levels of significance.

**Conclusion:** There is a significant reduction in pain and improvement in functional ability following the application of 8 weeks of kinesio taping and strengthening exercises in lateral ankle sprain subjects.

**Clinical Implication:** Kinesio taping and strengthening exercises are produce asignificant effect to manage lateral ankle sprain subjects.

**KEYWORDS:** Lateral ankle sprain, Kinesio taping, Strengthening exercises, Foot andAnkle Disability Index and Sports Module, Visual analog scale

### Article History

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## INTRODUCTION

The ankles are important parts that play the role of weight bearing and the role of adjusting lower limb movements during walking and exercise, which are important in daily living<sup>1</sup>. Ankle sprain is the common musculoskeletal injury in sports. It is due to inversion of a supinated plantar flexed foot. The ligament plays an important role in stabilizing the joints and preventing excessive movements<sup>2</sup>. When roll twists or turns the ankle leads to stretch (or)tear the ligament. The lateral ligament is mainly is affected by twisting movements of the sports<sup>3</sup>. Anterior talofibular ligament (ATFL) provides stability for movement of the talus suchas inversion. Posterior Talofibular ligament (PTFL) resist ankle dorsiflexion,adduction, etc. Calcaneo fibular ligament used to stability against maximum inversion (sub talar joint).Anterior talofibular ligament followed by calcaneo fibular ligament plantar flexion due to excessive elongation and tension of the anterior talofibular ligament<sup>4</sup>. It combined with forced inversion and plantar flexion because increased ligament stress and strain beyond the stretch point (or) ever ultimate failure strain complete tear. Generally, acute conditions are those that have been present for 7 to 10 days, sub-acute conditions have been present for 10 days to 7 weeks, and chronic conditions or symptoms have been present for longer than 7 weeks<sup>5</sup>.The ankle is one of the most common sites of injury in sports, with ankle sprains accounting for 85% of all ankle injuries. It is estimated that 70% of all high school players havea history of an ankle sprains, with an 80% recurrence rate. The high rate of injury and especiallyreinjure seen either ankle sprains has challenged the clinical community to reduce the incidencerate<sup>6</sup>.The ankle sprain is probably the single most common injury in sports. 85% of ankle injuries being ankle sprain, approximately 27000 ankle sprains daily in the United States. Survey comprised of (male 112, female 101) basketball players of an age groups 17 to 25 yearsin Punjab. In systematic review and meta-analysis have 181 studies were considered female: male ratio (13.6:6.94) Athletics 7 / 1000<sup>7</sup>.

Ankle sprain are common in athletes (especially in runners and joggers) Which may affect future athletic performance and put the athlete greater risk for re – injury. The athlete ‘‘going over on’’ the ankle, so the sole of the foot faces inwards and results in pain, swelling, and limitations of movements. While injury to the ligaments may result in decreased mechanical instability of the ankle, neuromuscular deficits are also likely to occur as a result of injury to the nervous and musculo – tendinous tissue<sup>8</sup>.

Ankle sprain injuries account for 68% of all ankle injuries, with an injury incidence rateof 0.7/1000 hours, which means that a professional football team with a 25players squad will incur five ankle sprain injuries per season. Restriction of dorsiflexion would normally be expected to limit gait and other functional activities. At least 10 degrees of dorsiflexion is required for normal walking, descending stairs and kneeling, whereas running requires 20 to 30 degrees of dorsiflexion<sup>9</sup>. Gait limitations have been reported, people with ankle sprains walkslowly and take smaller steps.

## **Mechanism of Injury**

Ankle sprains usually occur during a rapid shift of body center of mass over the landing or weight bearing foot. The ankle rolls outward, whilst the foot turns inward causing the lateral ligament to stretch and tear. When a ligament tears or is overstretched its previous elasticity and resilience rarely returns

## **MATERIALS AND METHODOLOGY**

### **Study Design**

A Pre-test and post-test simple experimental study design was used. A criteria –based convenient sampling was used to recruit patients (N=15) diagnosed with lateral ankle sprain. A single group was exposed to kinesio taping and strengthening exercises for the period of 8 weeks.

### **Subjects**

All those patients with lateral ankle sprain visiting the outpatient department of PPG college of physiotherapy, Coimbatore, Tamil Nadu state formed the population for this study. Among them, those patients (N=15) diagnosed with lateral ankle sprain. A single group was exposed to kinesio taping and strengthening exercises for the period of 8 weeks.

### **Methods**

The need and objectives of the study was clearly explained to the ethical committee of PPG College of physiotherapy, Coimbatore and permission was obtained. Then, the study was planned to conduct at outpatient department of PPG College of physiotherapy. Based on the selection criteria 15 subjects with grade 2 lateral ankle sprains were selected for this study. Clear explanation and instructions were given to the subjects regarding to the study procedure, merits and demerits of the interventions before starting the sessions. Then the written informed consent form was obtained from the selected lateral ankle sprain players to the pre test evaluation. Prior to the treatment all the subjects were checked for adhesive allergic test. The pre test and post test were measured using VAS scale and Foot and ankle disability index score and sport module. Total duration of the each session is 30 minutes. The subjects were given kinesio taping for 3 alternative days for and 30 minutes strengthening exercise for 4 weeks. The total treatment duration was 8 weeks and each week for 3 sessions, a total of 24 sessions. The pre test was taken before the first session of the treatment and the post test was taken after the last session of the treatment and the data were recorded and documented

### **Description of experimental interventions Kinesio taping**

Kinesio taping (KT) is air-permeable and water resistant and can be worn for several days without removal. The application of KT has been suggested to result in an improvement in muscle contractility by supporting weakened muscles, decreasing inflammation and pain by increasing lymph and blood flow, and increasing the range of motion of the joint by adjusting the misalignment of muscle fibers, myofascia and joints. KT may also assist in the management of ankle sprain by reducing pain, altering muscle function, improving circulation, enhancing proprioception and repositioning subluxed joints.

### **Strengthening Exercise**

Muscle strengthening is a major component of designing every treatment program. It focuses on regaining muscle strength,

power and endurance and it is any practice or exercise designed specifically to increase strength Exercise plays a important role in the treatment of a Ankle joint. It increases the muscle strength, keep the Ankle Joint flexible, control weight, and strengthen bone and ligaments.

### Statistical Analysis

**Table 1: Descriptive Analysis for Pain and Functional Performance**

TEST	MEAN	STANDARD DEVIATION
PRE TEST	41.7	1.97
POSTTEST	85.0	2.89

### RESULT

The calculated T value and table t value were 16.3 and 2.14. The obtained t value is greater than the table value at the level of significance 0.05. The statistical report stated that there was significant improvement pain and functional performance after application of kinesiotaping along with strengthening exercises in soccer players with lateral ankle sprain.

**Table 2: Descriptive Analysis of Pain with Visual Analogue Scale**

S.NO	TEST	MEAN	SD VALUE
1.	PRE TEST	5.5	0.48
2.	POST TEST	1.86	0.22

### RESULT

The pre mean & standard deviation values of PAIN were 5.5 and 0.48. The post mean and standard deviation values of PAIN using VAS were 1.86 and 0.22. The t value is 14.2, the obtained t value is greater than the table value that is 2.145 at level of 0.05. Hence, the statistical report states that there were significant improvements in pain after the application of ultrasound therapy along with therapeutic exercise and so the alternative hypothesis is accepted in type 1 error.

### DISCUSSIONS

An ankle sprain is an injury to the tough bands of tissue (ligaments) that surround and connect the bones of the leg to the foot. The injury typically happens when you accidentally twist or turn your ankle in an awkward way. This can stretch or tear the ligaments that hold your ankle bones and joints together. Lateral ankle sprains usually occur during a rapid shift of body center of mass over the landing or weight-bearing foot.

The ankle rolls outward, whilst the foot turns inward causing the lateral ligament to stretch and tear. When a ligament tears or is overstretched its previous elasticity and resilience rarely returns. Some researchers have described situations where return to play is allowed too early, compromising sufficient ligamentous repair. Reports have proposed that the greater the level of plantar flexion the higher the likelihood of sprain in an epidemiological study of unilateral ankle sprains, reported that the dominant leg is 2.4 times more vulnerable to sprain than the non-dominant one. A less common mechanism of injury involves forceful eversion movement at the ankle injuring the strong deltoid ligament. Patient presents with inversion injury or forceful eversion injury to the ankle may have previous history of ankle injuries or instability and able to partial weight-bearing on the affected side. If patient presents with description of cold foot or paresthesia, suspect neurovascular compromise of peroneal nerve. Tenderness, swelling and bruising can occur on either

side of the ankle. No bony tenderness, deformity or crepitus present. The aim of the study was to determine the effectiveness of kinesio taping along with strengthening exercises on pain and ankle stability among soccer players with grade 2 lateral ankle sprain. According Young Jun Shin: He conducted a study on immediate effects of ankle balance taping with kinesiology tape for amateur soccer players with lateral ankle sprain a randomized cross-over design. Twenty-two soccer players with an ankle sprain underwent 3 interventions in a random order. Subjects were randomly assigned to ankle balance taping, placebo taping, and no taping groups. We conclude that ankle balance taping that uses kinesiology tape instantly increased the walking ability of amateur soccer players with lateral ankle sprain. Therefore, ankle balance taping is a useful alternative to prevent and treat ankle sprain of soccer players. The subjects are given the FAAM questionnaire and the numerical pain rating scale for indicating their pain intensity. These scores were recorded as pretest values.

Prior to the treatment all the subjects were checked for adhesive allergic test.

Kinesiotaping (KT) is air-permeable and water resistant and can be worn for several days without removal. The application of KT has been suggested to result in an improvement in muscle contractility by supporting weakened muscles, decreasing inflammation and pain by increasing lymph and blood flow, and increasing the range of motion of the joint by adjusting the misalignment of muscle fibers, myofascia and joints. KT may also assist in the management of ankle sprain by reducing pain, altering muscle function, improving circulation, enhancing proprioception and repositioning subluxed joints.

The pretest and post-test were measured using VAS scale and Foot and Ankle disability index score and sports module. Total treatment duration was 8 weeks.

Total duration of the each session is 30 minutes. The subjects were given kinesio taping for 3 alternative days and strengthening exercise for 30 minutes. The total treatment duration was 8 weeks and each week for 3 sessions, a total of 24 sessions. The pre test was taken before the first session of the treatment and the post test was taken after the last session of the treatment and the data were recorded and documented.

In this study was discussed that the application of kinesio taping and strengthening exercises reduces pain and improve functional performance among lateral ankle sprain subjects. The statistical analysis also supports the alternate hypothesis.

## **LIMITATIONS**

- Size of the sample was very small.
- The study duration was of short duration.
- The outcome was measured by Foot and ankle disability index scale and sports module.
- It is a simple experimental study; comparative study can also be done.

## **CONCLUSIONS**

The study finally concluded that there was statistically significant reduction in pain and improvement in functional performance after kinesio taping along with strengthening exercises for 8 weeks among patients with lateral ankle sprain.

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