EFFECTIVENESS OF KINESIO TAPING VERSUS ATHLETIC TAPING IN CHRONIC ANKLE INSTABILITY AMONG YOUNG SPORTS PLAYERS

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Abstract:
Background and Objective: Ankle sprains are the most common type of injury in team sports. There is evidence that sports players have a twofold risk for reinjury after a previous ankle sprain, especially during first year post-injury. Recurrences of ankle sprains may result in disability and chronic pain or instability. Ankle instability is characterized by recurrent giving way and often develops after repeated lateral ankle sprains. There is evidence that performing proprioception exercises in conjunction with taping improved the performance of subjects with chronic ankle instability. There hasn’t been a lot of research comparing Kinesio taping and Athletic taping. Thus, the need for the investigation is created.

Methods: Randomized controlled trail. In this study, there were 140 subjects with 18-30 years of age, a clinical diagnosis of chronic ankle instability and who were divided into two groups randomly. The subjects in Group A(n=70) received Kinesio taping, while the subjects in Group B(n=70) received. Intervention was given to participants twice a week for eight weeks. The CAIT for instability and SEBT for functional performance were used to assess the effectiveness of the interventions.

Results: Independent ‘t’ test was used to compare the mean significance difference between continuous variables. Paired t-test was used to assess the statistical difference between pre-test and post-test scores. Statistical analysis of this data revealed that, both groups significantly improved in both parameters when compared within groups, but when compared between groups, the Kinesio taping group improved better than the Athletic taping group.

Conclusion: The present study concluded that both Kinesio taping and Athletic taping are effective in increasing stability and functional performance. However, Kinesio taping is more effective in decreasing instability and improving functional performance when compared to Athletic taping in subjects with chronic ankle instability.

Key words: Chronic Ankle Instability, Kinesio taping, Athletic taping, Proprioceptive training, Cumberland Ankle Instability Tool, Star Excursion Balance Test.

INTRODUCTION:
Ankle injuries are the most common injuries across a wide variety of sports. Among ankle injuries, ankle sprain is the most frequent and accounts for approximately 80% of ankle injuries. The most common ankle injury is lateral ankle sprain that occurs in people participating in sports activities which might lead to their physical disability. A large percentage of ankle sprains, up to 70% in athletes, are recurrent, resulting in Chronic Ankle Instability (CAI). Chronic ankle instability is defined as the susceptibility of the ankle to giving way during activity, with or without mechanical instability. Giving way is considered an or unpredictable excessive inversion of the ankle joints that occur at heel strike or toe-off during walking or running. Ankle sprain is one of the most common musculoskeletal injuries among athletes. During a sports activity, a sudden twist occurs from an inversion, supination, and plantar flexion mechanism of injury, which can result in ankle sprain, which is considered a common musculoskeletal injury. The most ankle sprain injuries were caused by an increased supination movement at subtalar joint, which was often a result of the position and the magnitude of the vertically projected ground reaction force at initial foot contact. Some researchers have reported that increased touch down plantar flexion caused increased ankle sprain occurrences. When a foot was plantar flexed during touchdown, the contact to the ground was made with the forefoot, thus increased the moment arm among the subtalar joint axis and also the resultant joint torque to cause sudden explosive twisting motion and ankle sprain injury. The frequency of ankle instability is 57.74%. Worldwide, there are 45.14 to 58.4 sprains per 1000 people per year with a prevalence of 43.1% for chronic ankle instability.
Chronic Ankle Instability might develop due to many reasons such as mechanical Disorders (joint laxity, changes in motion pattern, degenerative or synovial changes in talocrural joint cartilage) or functional disorders (defects in proprioception, muscle strength or control).[11] Ankle instability symptoms include giving way feeling, pain, swelling, weakness, stiffness, tenderness around the ankle limitations in daily activities and sports. [12] Based on the signs and symptoms sprains are classified into three grades: A Grade I ankle sprain is defined as lack of a hematoma and sensitivity at the anterior lateral ligament. Grade II is defined as noticeable damage to lateral ligaments and existence of hematoma at the anterior lateral ligament without instability, while grade III is defined as the existence of hematoma at anterior lateral ligament with instability.[13] Usually, the primary treatment is rest with ice, and limiting the amount of weight bearing and walking on the injured ankle. The most common treatment methods described for severe, grade III ankle sprains are a brief period of rigid immobilization (e.g., < 10 d), functional management with transition to a semi-rigid external restraint, and delayed surgical repair in select high demand patients. Rigid immobilization in a cast is typically reserved for lower demand patients and should be employed for a period of no more than 3 weeks, followed by sustained course of physical therapy for muscle strengthening and proprioceptive retraining. The functional management of the acute ankle sprain includes early immobilization, weight bearing with an external restraint such as brace, non-steroidal anti-inflammatory medication and other anti- oedema measures. Following the acute phase, a physical therapy regimen may be utilized to focus on muscle strengthening and postural training. [14] Many researchers assessed the role of taping and proprioceptive training in the treatment of ankle sprain. the result of their studies showed that taping and proprioceptive training can be effective in treating ankle instability.[3] Among the methods of ankle support, various types of tapes are constantly used to reduce the occurrence of injuries in multidirectional sports and provides stability through mechanisms such as limiting movement and improving kinesthesia, which is achieved by increasing of proprioceptive stimuli on the skin. Various types of athletic tape have been used in the prevention of sports injuries promoting protection and support for the joint or muscles during movement. The most commonly used type of taping is rigid, which provides stability enhancement by limiting and decelerating joint movements, as well as aff erent impulses to the central nervous system, improving the joint position and direction of motion.[15] Kenzo Kase introduced a new type of tape called Kinesio-Tape (KT) IN 1980. It is pliable, allowing for a greater range of motion and it can be stretched up to 140% of its longitudinal length before application, promoting a constant friction force on the skin. Because the constant pressure and elongation generated by the tape can stimulate mechanoreceptors that provide information about movement and articular position, such friction force contributes to the improvement of kinaesthetic awareness. Furthermore, KT promotes joint misalignment correction and muscle and fascia support during movements,[16] Proprioception refers to the inborn sense of relative positioning of the body in order to execute kinaesthetic movements. Proprioception includes muscle memory and co-ordination elements that are thought to be regulated by sensory neurons located in the inner ear and stretch receptors located in joint supporting muscles and ligaments. These specific nerve receptors, known as proprioceptors, coordinate the timing, bodily position, spatial relationship, and force needed for the foot to strike the ball during an athletic movement such as kicking a soccer ball. Proprioception elements become automatic with repetitive training, allowing an athlete to concentrate on other aspects of performance such as executing an offensive play.[17] Kinesio taping and Athletic taping will be helpful in enhancing ankle stability, according to prior studies. Proprioceptive exercises may have an even greater impact on enhancing the performance of athletes with chronic ankle instability than tape alone. Thus, the aim of the study was to compare the effectiveness of Kinesio taping and Athletic taping in chronic ankle instability among young sports players.

MATERIALS AND METHODS:

Study design: Prospective study design
Ethical clearance and informed consent: The study protocol was approved by the Ethical Committee of GSL Medical College & General Hospital (Annexure-I). The investigator explained the purpose of the study and given the subject information sheet. The participants were requested to provide their consent to participation in the study (Annexure-II). All the participants signed the informed consent and the rights of the included participants have been secured.
Study population: Subjects clinically diagnosed with chronic ankle instability by an orthopaedician.
Study setting: Subjects were recruited from outpatient department of physiotherapy, GSL general hospital, Rajamahendravaram, and SAAP, Vijayawada, Andhra Pradesh, India.
study duration: The study was conducted during the period of one year.
Intervention duration: 2 sessions per week for 8 weeks
Study sampling method: Systematic random sampling method
Sample size: A total number of 140 subjects, both men and women with chronic ankle instability who are willing to participate in this study were included in this study, all the recruited participants were explained about the study. After obtaining informed consent form and meeting the criteria, total 140 subjects were allocated into two groups equally by systematic random sampling.

Group A- Kinesio taping (70 subjects)
Group B- Athletic taping (70 subjects)

MATERIALS USED

- Kinesio tape
- Athletic tape
- Cumberland ankle instability tool
CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA:

- Subjects aged between 18 -30 years
- Subjects with a history of ankle re-sprains (at least 3 times)
- Subjects with at least one ankle give way during the last 6 months
- Subjects who score 27 or less in the Cumberland ankle instability tool.

EXCLUSION CRITERIA:

- Subjects with fractures of the lower extremity
- Subjects who had undergone any lower extremity surgery
- Subjects with any other lower extremity disorders or diseases such as osteoarthritis or anterior cruciate ligament injury
- Regular use of medication
- History of physiotherapy for the lower extremity during last 6 months
- Any neurological disorders

STUDY TOOLS AND OUTCOME MEASURES

Cumberland Ankle Instability Tool (CAIT): The Cumberland Ankle Instability tool is a 9-item 30-point scale, for measuring severity of functional ankle instability. CAIT is a valid and reliable instrument fit to assess ankle instability. Hiller et al calculated a value of 27.5 as an indication for an unstable ankle in their design of CAIT. This means all scores less than or equal to 27 represent unstable ankles and only 3 points (28-30) represents a stable ankle. Clinically, the CAIT will be useful tool for assessing the severity of functional ankle instability, measuring treatment outcome, and monitoring progress. In research, the CAIT will enable more homogenous subject groups to be identified, objectively defined and compared.[18]

Star Excursion Balance Test (SEBT): The SEBT is a reliable, responsive, and clinically relevant functional assessment of lower limbs dynamic postural control. The SEBT consisted of a series of mini unilateral squats performed in the centre of a wind rose. The subject attempted to reach as far as possible in each of the eight directions with the opposite leg. It is considered that the greater the distance reached in the test, the better the functional performance of the subject and the greater the ankle instability. The testing procedure starts with the athlete standing on his dominant leg at the centre of the grid, which is formed by eight lines extending at an angle of 45 from each other. The subject then touches the farthest point as lightly as possible on each of the eight lines while maintaining single-leg stance. The researcher marks the point touched by the subject using a temporary marker and manually measures the distance from the centre of the grid to the point touched by the subject using measuring tape. The lines were labelled as follows:

- A: Anterior excursion
- AM: Anteromedial excursion
- M: Medial excursion
- PM: Posteromedial excursion
- P: Lateral excursion
- PL: Posterolateral excursion
- L: Lateral excursion
- AL: Anterolateral excursion

All subjects will be asked to perform three trials, and the average will be taken for analysis. The trial would be considered invalid if the subjects;

- a) Removed their hand from their hip
- b) Are unable to maintain a single limb stance
- c) Shift their weight to the reach foot
- d) Are unable to return the reach foot to the starting position prior to reaching another direction.

In case of an invalid trial, the data will be discarded and the trial will be repeated. The reach distance will be measured in inches. Several studies revealed that this procedure could be simplified with only three lines or three directions named according to the stance foot: anterior (A), posteromedial (PM), posterolateral (PL). This simplified version is nowadays commonly used. The modified SEBT is a clinically meaningful test for assessing dynamic postural control that can be easily implemented.[19]
INTERVENTIONS

This is an 8-week study which includes Kinesio taping, proprioception exercises for Group A and Athletic taping, proprioception exercises for Group B. The outcomes were measured by Cumberland Ankle Instability Tool for severity of functional joint instability and Star Excursion Balance Test for functional performance. All the subjects who are eligible for criteria were allocated randomly into Group A and Group B.

GROUP I
KINESIO TAPING [20,21]

Subjects in this group received Kinesio taping and proprioception exercises. Kinesio tape was applied on the tibiofibular ligament and peroneal muscles with a supporting technique. In order to apply Kinesio tape on the peroneus longus muscle, the subjects sat in a supine position or sat with legs stretched. One end of the Kinesio tape was struck to the first part of the plantar base of the first metatarsal. The ankle was placed in plantar flexion and inversion position to increase tissue tension and the Kinesio tape was drawn on the peroneus longus tendon route, so that it crossed behind the outer ankle and final stuck to the end of fibula bone.

Peroneus brevis muscle KT application was different from that of the peroneus longus. The ankle was in dorsiflexion and inversion position to increase tissue tension. The rest of the tape was stuck on the route of peroneal muscles to the fibula end. In order to tape the tibiofibular ligament to it, the subject’s knee was in extension position and the ankle was in a dorsiflexion position. Then one end of the tape was stuck on the inner ankle. After ensuring the fixation of tape on the inner ankle, Kinesio taping continued by the mild tension of 25% towards the anterior part of the ankle and its end was attached to the outer ankle without tension. This type of Kinesio taping covers the anterior and posterior ligaments.

The subjects in this group used Kinesio taping during exercises. They also benefited from KT on the days of the week without training. The KT tapes were changed at every training session (twice a week) to maintain their adhesiveness.
GROUP II

ATHLETIC TAPING \cite{22,23}

Subjects in this group received Athletic taping and proprioception exercises. In order to apply Athletic tape the subject sat in a supine position or sat with legs stretched. The ankle is placed in the neutral position, two anchors were placed - one above the malleolus and the other in the middle region of the metatarsals – following the application of three longitudinal ribbons from the medial region to the lateral one passing through the hind foot three horseshoe-shaped horizontal ribbons with a midpoint in the Achilles tendon and with the tips at the distal anchor, a tape for stabilization of the subtalar joint that leaves the lateral dorsal region of the joint is terminated in the lateral malleolus and, finally, anchor ribbons. The athletic tape was reapplied at every session of training or when subjects indicated that stability was lost from the Athletic tape or for hygiene purposes or skin related disorders.

Both applications of tapes were preceded by shaving and hygienization of the skin with alcohol ethyl 70% hydrated. The proprioceptive exercise program is given commonly to the subjects in both the groups. The proprioceptive exercise program consisted of several closed kinetic chain exercises in the weight bearing status. Participants were encouraged to perform the exercises as part of their warm up to their normal sporting activity. Gradual increase of training load, that is exercises become more difficult after several sessions. Applied exercises include one-legged knee flexion, toe stand, runners pose, toe walk. During the first two weeks, three sets of 10 repetitions were considered for each exercise. In the third and fourth weeks, the exercises continued on unstable surfaces. In the last four weeks some perturbations were added. All these exercises focused on motor control of eccentric contractions of foot muscles in order to increase the ability of the muscles to stable the ankle.

Figure 4: Application of Kinesio taping
Figure 5: Application of Athletic taping

Exercise difficulty levels

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Difficulty level</th>
</tr>
</thead>
</table>
| one-legged knee flexion | 1. on even surface  
                           2. on even surface; eyes shut  
                           3. on balance board               |
| Toe-stand            | 1. high surface; without hand hold  
                           2. on high surface; without handhold |
| one-legged stance    | 1. on even surface  
                           2. on even surface; eyes shut  
                           3. on balance board               |
| runners pose         | 1. on even surface  
                           2. on even surface; eyes shut  
                           3. on balance board               |
| crossed leg-sway     | 1. on even surface; with handhold  
                           2. on even surface; without handhold  
                           3. on even surface; eyes shut and without handhold  
                           4. on even surface; eyes shut and without handhold, on balance board |
| Toe walk             | 1. on even surface; walking  
                           2. on even surface, jumping          |
Figure 6: Subject performing one-legged knee flexion on balance board

Figure 7: Subject performing toe stand on high surface; without handhold
Figure 8: Subject performing one-legged stance on balance board

Figure 9: Subject performing runner’s pose on balance board
Figure 10: Subject performing crossed leg sway on even surface without handhold; eyes shut

Figure 11: Subject performing toe jumping on even surface
FLOW CHART

Assessed for eligibility (n= 202)

Excluded (n=46)
Not meeting inclusion criteria (n=9),
Refused to participate (n=7)

Randomized (n=140)
Randomization: (n= 70) each group

GROUP-I
Kinesio Taping
(n=70)

GROUP-II
Athletic Taping (n=70)

Outcome measures: SEBT, CAIT

8 weeks
Analysed for instability and functional performance

8 weeks
Analysed for instability and functional performance

Post Test Analysis

Analysed (n=70)

Analysed (n=70)

Outcome Measures: CAIT, SEBT
STATISTICAL ANALYSIS:
All Statistical analysis was done by using SPSS software version 21.0 and Microsoft excel-2007. Descriptive data was presented in the form of mean +/- standard deviation and mean difference percentages were calculated and presented.

Within the groups: Paired student “t” test was performed to assess the statistical difference within the groups for pain, and function (Modified OSW) from pre-test and post-test values.

Between the groups: Independent student “t” test was performed to assess the statistically significant difference in mean value between the groups for visual Analogue Scale for Pain, Modified Oswestry Low Back Pain Disability Questionnaire for Function. For all statistical analysis, p ≤ 0.05 will be considered as statistically significant.

RESULTS:
The results of this study were analysed in terms of instability on CAIT questionnaire and improved functional performance on SEBT. The consort flow chart of the study showed the study organization in terms of subject screening, random allocation and analysis following the intervention.

Total 202 subjects with chronic ankle instability were screened for eligibility, amongst 140 subjects were included in the study trial. All the 140 subjects who met inclusion criteria have undergone baseline assessment and included subjects were randomized into two equal groups consisting 70 in each group. Comparison was done within the group as well as in between the two groups. So, as to evaluate the intra group and intergroup effectiveness of Kinesio taping and Athletic taping and proprioceptive exercises which are under considerations in the present study.

ANALYSIS OF MEAN SCORE OF CAIT WITHIN GROUP A

<table>
<thead>
<tr>
<th>GROUP A</th>
<th>MEAN</th>
<th>SD</th>
<th>P VALUE</th>
<th>INFERENCE</th>
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<tbody>
<tr>
<td>CAIT</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PRE</td>
<td>7.543</td>
<td>2.0337</td>
<td>0.0001</td>
<td>Highly Significant</td>
</tr>
<tr>
<td>POST</td>
<td>21.514</td>
<td>2.7754</td>
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TABLE - 1

ANALYSIS OF MEAN SCORE OF CAIT WITHIN GROUP B

<table>
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<th>GROUP B</th>
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<th>SD</th>
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<tr>
<td>POST</td>
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<td>2.3593</td>
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TABLE - 2

COMPARISON OF MEAN SCORE OF CAIT IN BETWEEN THE GROUPS AT BASELINE AND POST-TEST

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<th>CAIT</th>
<th>MEAN</th>
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<tbody>
<tr>
<td>PRE</td>
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<tr>
<td>Group A</td>
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<td>POST</td>
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<tr>
<td>Group A</td>
<td>21.514</td>
<td>2.7754</td>
<td>0.0001</td>
<td>Highly Significant</td>
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<tr>
<td>Group B</td>
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TABLE – 3
### ANALYSIS OF MEAN SCORE OF SEBT(A) WITHIN GROUP A

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<tbody>
<tr>
<td>SEBT (A)</td>
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<td></td>
</tr>
<tr>
<td>PRE</td>
<td>38.373</td>
<td>1.8676</td>
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<td>Highly Significant</td>
</tr>
<tr>
<td>POST</td>
<td>72.024</td>
<td>3.5924</td>
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**TABLE - 4**

### ANALYSIS OF MEAN SCORE OF SEBT(A) WITHIN GROUP B

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<td></td>
<td></td>
</tr>
<tr>
<td>PRE</td>
<td>38.663</td>
<td>2.2669</td>
<td>0.0001</td>
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</tr>
<tr>
<td>POST</td>
<td>58.933</td>
<td>2.5221</td>
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</table>

**TABLE - 5**

### COMPARISON OF MEAN SCORE OF SEBT(A) IN BETWEEN THE GROUPS AT BASELINE AND POST-TEST

<table>
<thead>
<tr>
<th>SEBT(A)</th>
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<th>SD</th>
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<td>PRE</td>
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<tr>
<td>Group A</td>
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<tr>
<td>Group A</td>
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<td>3.5924</td>
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<tr>
<td>Group B</td>
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**TABLE – 6**

### ANALYSIS OF MEAN SCORE OF SEBT(PM) WITHIN GROUP A

<table>
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<tr>
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<td></td>
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</tr>
<tr>
<td>PRE</td>
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<td>POST</td>
<td>71.104</td>
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**TABLE – 7**
### Table 8: Analysis of Mean Score of SEBT(PM) Within Group B

<table>
<thead>
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<tbody>
<tr>
<td>PRE</td>
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<td>2.086</td>
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<td>Highly Significant</td>
</tr>
<tr>
<td>POST</td>
<td>62.196</td>
<td>2.880</td>
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### Table 9: Comparison of Mean Score of SEBT(PM) In Between The Groups at Baseline and Post-Test

<table>
<thead>
<tr>
<th>SEBT(PM)</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>p value</th>
<th>Inference</th>
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<td>PRE</td>
<td>A</td>
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<td>2.030</td>
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<tr>
<td></td>
<td>B</td>
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<td>2.086</td>
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<tr>
<td>POST</td>
<td>A</td>
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<td>Highly Significant</td>
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### Table 10: Analysis of Mean Score of SEBT(PL) Within Group A

<table>
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<th>Mean</th>
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<tr>
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<td>POST</td>
<td>69.171</td>
<td>2.178</td>
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### Table 11: Analysis of Mean Score of SEBT(PL) Within Group B

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<tr>
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<th>Mean</th>
<th>SD</th>
<th>P Value</th>
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</tr>
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<tbody>
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</tr>
<tr>
<td>POST</td>
<td>61.159</td>
<td>2.785</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COMPARISON OF MEAN SCORE OF SEBT(PL) IN BETWEEN THE GROUPS AT BASELINE AND POST-TEST

<table>
<thead>
<tr>
<th>SEBT(PL)</th>
<th>MEAN</th>
<th>SD</th>
<th>P VALUE</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE</td>
<td>Group A</td>
<td>40.297</td>
<td>2.0303</td>
<td>0.594</td>
</tr>
<tr>
<td></td>
<td>Group B</td>
<td>40.483</td>
<td>2.0856</td>
<td></td>
</tr>
<tr>
<td>POST</td>
<td>Group A</td>
<td>71.104</td>
<td>3.8090</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Group B</td>
<td>62.196</td>
<td>2.8800</td>
<td></td>
</tr>
</tbody>
</table>

TABLE-12

ANALYSIS OF MEAN SCORE OF COMPOSITE SCORE % OF SEBT WITHIN GROUP A

<table>
<thead>
<tr>
<th>GROUP A</th>
<th>MEAN</th>
<th>SD</th>
<th>P VALUE</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPOSITE SCORE % OF SEBT</td>
<td>PRE</td>
<td>39.307</td>
<td>1.8875</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>70.835</td>
<td>2.1604</td>
<td></td>
</tr>
</tbody>
</table>

TABLE - 13

ANALYSIS OF MEAN SCORE OF COMPOSITE SCORE % OF SEBT WITHIN GROUP B

<table>
<thead>
<tr>
<th>GROUP B</th>
<th>MEAN</th>
<th>SD</th>
<th>P VALUE</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPOSITE SCORE%</td>
<td>PRE</td>
<td>39.491</td>
<td>1.3970</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>60.769</td>
<td>1.6749</td>
<td></td>
</tr>
</tbody>
</table>

TABLE – 14

COMPARISON OF MEAN SCORE OF COMPOSITE SCORE % OF SEBT IN BETWEEN THE GROUPS AT BASELINE AND POST-TEST

<table>
<thead>
<tr>
<th>COMPOSITE SCORE %</th>
<th>MEAN</th>
<th>SD</th>
<th>P VALUE</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE</td>
<td>GROUP A</td>
<td>39.307</td>
<td>1.8875</td>
<td>0.518</td>
</tr>
<tr>
<td></td>
<td>GROUP B</td>
<td>39.488</td>
<td>1.3871</td>
<td></td>
</tr>
<tr>
<td>POST</td>
<td>GROUP A</td>
<td>70.835</td>
<td>2.1604</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>GROUP B</td>
<td>60.769</td>
<td>1.6749</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION:
The purpose of this study was to compare the effectiveness of Kinesio taping with athletic taping for treating chronic ankle instability in young athletes. The functional joint stability and functional performance were assessed using the Cumberland Ankle Instability Tool (CAIT) and the Star Excursion Balance Test (SEBT).

Both the CAIT Questionnaire and the SEBT revealed a considerable improvement in both groups. In participants with chronic ankle instability, the two methods were successful in improving functional joint stability and functional performance.

Both the Kinesio taping group and the Athletic taping group showed statistically significant differences. But, the Kinesio taping group (CAIT mean - 21.514, SEBT A mean - 72.024, SEBT PM mean -71.104, SEBT PL mean - 69.171) showed statistically effective when compared to the Athletic taping group (CAIT mean - 19.643, SEBT A mean -58.933, SEBT PM mean -62.196, SEBT PL mean -61.159).

According to a previous study by Vahid Mazloum and Mansour Salebozamani titled "The Effects of Kinesiotaping and Proprioceptive Exercises in Rehabilitation Management of Volleyball Players with Chronic Ankle Instability," exercise therapy and KT, as well as their combination, can improve the functional ability and performance of volleyball players with chronic ankle instability. This study supports that finding.

Neurological processes (proprioception, reflexes, and muscle reaction time), mechanical factors (ligament laxity), and muscular factors (power, strength, and endurance) all contribute to chronic ankle instability.[24][25] The anterior talofibular ligament (ATFL) is frequently injured in a lateral ankle sprain because it has the lowest ultimate load, is the weakest, and has anatomical locations and insertions. The calcaneofibular ligament (CFL) is bigger, stronger, and runs obliquely in comparison to the ATFL.

Strong and thick, the posterior talofibular ligament is only infrequently injured.[26]

According to a quantitative magnetic resonance imaging (MRI) investigation, stable ankles had a lower ATFL length or width while CAI ankles had a larger signal intensity.[27]

The mechanism that causes injury to the lateral ankle ligaments in lateral ankle sprains has been described as excessive plantar flexion and inversion. The first injury to the lateral ankle ligaments changes how these ligaments' mechanoreceptors work, impairing their ability to detect motion at the joint. When the lateral ligaments' mechanoreceptors, which are involved in posture control and muscle function, are damaged, the muscles that surround the joint may also be impacted.

Kinematic and kinetic alterations during walking have also been connected to changes in sensorimotor control. Clinical impairments in dynamic and static balance as well as subjective function have been found. The most widely accepted explanation for the subjective instability is the significance of sensory information from the structures that surround the ankle. The redundancy in sensing force position, joint position, stretch and tension in these sensory systems emphasize the importance of these structures in healthy individuals. Deficits in sensation of vibration, joint position sense, force sense have been identified in patients with ankle instability.[28]

Jackson et al. provided support for the effect of KT on skin mechanoreceptors and proposed that the pressure and compression created by the KT motivates skin mechanoreceptors. Proprioception is improved by the motivation of cutaneous mechanoreceptors, which improves the information transfer concerning joint position and movement. Jackson et al sought to ascertain the effectiveness of KT in minimising the balance deficits that CAI patients experience. According to Jackson et al finding's balance improved 48 hours after KT treatment and persisted for 72 hours. The investigation of balance on stable and foam surfaces is an intriguing aspect of the study by Jackson et al. They found that the KT group had much superior balance control when using foam surfaces.[29]

The Kinesio tape's effects on weakened muscles cause altered muscle function, which in turn improves blood and lymph circulation and eliminates tissue fluid. It also reduces pain by suppressing nerve signals, which helps realign subluxed joints by relieving abnormal muscle tension and influencing the function of fascia and muscle.[25][30]

Non-elastic adhesive tape has been utilised in the treatment of ankle injuries as well as injury prevention. The effectiveness of this kind of tape in preventing ankle inversion has been demonstrated, and its use may reduce the frequency of ankle sprains. The mechanism at fault cannot just be a result of the mechanical limitation of the ankle's range of inversion. Applying sticky tape may also have other preventive advantages, according to theories about its effects on the inversion motion's speed, afferent input to the central nervous system, and placebo effects.[4]

The ability to maintain optimal body positioning, especially during unexpected sports activities, depends on proprioception sense, which is crucial to preventing sports injuries [17]. The goal of proprioceptive balancing board training is to alter the structural properties of the ankle by re-enforcing the muscles and ligaments and regaining proprioception of the injured ankle structures.[1] In this study, the training regimen for both groups concentrated on ankle motions, including plantar flexion and inversion motions. The exercises used in this study were progressive. In other words, over the last three weeks, methods to enhance proprioceptive exercises included standing on one foot, performing the exercises with the eyes closed, using unstable surfaces, and providing therapist perturbations. It indicates that the player must replace motion patterns with variable feedbacks by altering the somatosensory and visual feedback. Afferents carry sensory information from all body parts to the central nervous system when the body responds to applied disturbances in various ways. Therefore, both conscious and unconscious responses are required to safeguard the stability of the joint.[31][32][33]

By the end of 8 weeks of intervention program, the subjects in group A (Kinesio taping) had significantly improved CAIT (P = 0.001), SEBT A, PM, PL (P = 0.001).

In this 8 week of intervention program, there was a significant difference in subjects of group B (Athletic taping) in CAIT (P = 0.001), SEBT A, PM, PL (P = 0.001), the mean pre and post test scores showed that both the Kinesio taping and Athletic taping were individually beneficial in reducing instability and improving functional performance.

Kinesio taping and Athletic taping showed statistically significant post-test results for reduction in instability and improvement in functional performance. When the post-treatment values of the Kinesio taping and Athletic taping groups were compared, the mean values of the outcome measures showed a significant difference, indicating that Kinesio taping is more effective at
improving stability and enhancing functional performance. According to the findings of the current study, eight weeks of Kinesio taping and Athletic taping interventions significantly improved stability and functional performance. However, comparisons between the group’s data indicate that both therapies are successful. But Kinesio taping displays marginally superior outcomes.

LIMITATIONS:

- Less treatment sessions per week.
- No blinding of evaluators.
- No follow up.
- No control group.

RECOMMENDATIONS FOR FURTHER RESEARCH:

- Weekly sessions can be increased to get better results
- Follow up after 8 weeks could be beneficial to determine the improvement of performance in players
- This study included the subjects with the age group between 18-30 years. For further research, the intervention can be given to the subjects above 30 years.

CONCLUSION:

After 8 weeks of intervention both the groups showed improvement in reducing instability and increasing functional performance in subjects with Chronic Ankle Instability. However, Kinesio Taping is more effective when compared to Athletic Taping.

REFERENCES:

17. Berk KA. Is proprioceptive training effective in reducing the recurrence of ankle sprains among athletes?