# **Comparison of Weight Bearing Exercises with and Without Kinesiotape in Chronic Ankle Sprain in Soccer Players**

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#### Abstract

**Background:** Ankle sprains are one of the most common sports injuries. Awareness of position of foot being inadequate is considered to be a basic cause of these sports injuries of ankle. Ankle taping is supposed to lessen the risk of having injury by making improvements in awareness of foot position. **Objective:** Comparison of weight bearing exercises with and without kinesiotape in ankle pain in soccer players.

**Material and Methods:** RCT was done on 16 ankle sprain patients randomized into 2 groups (8 in each group). Group 1 was treated with weight bearing exercises with kinesio taping and group 2 with only weight bearing exercises. Data collected by the convenient sampling technique from LDA sports complex by using questioner of visual analogue scale, Foot and ankle outcome Score and SF-36 questionnaire for both groups at the beginning of study and after treatment. The study completed within 6 months after the approval of synopsis. Data were entered into SPSS for statistical analysis.

**Results:** Among 16 participants 9 (56.3%) were male and 7 (43.8%) were female. mean age was  $34 \pm 5.35$ . Mean weight was  $68.5 \pm 5.83$ . Mean height was  $166 \pm 11.65$  cm. mean body mass index was  $25.25 \pm 4.38$ . There was significant difference between the mean value of visual analogue scale, SF-36 and foot and ankle outcome score, pre-treatment and after treatment. Significant difference was also found between the treatment group and control group in the favor of treatment group.

**Conclusion:** A significant difference was observed between the mean value of visual analogue scale, SF-36 and foot and ankle outcome score, pre-treatment and after treatment. Significant difference was also found between the Treatment group and control group in the favor of treatment group.

Keywords: Ankle sprain; Visual analogue scale; Ankle injuries

**Abbreviations:** AS:Ankle Sprain; ROM:Range of Motion; KT:Kinesio Taping; VAS:Visual Analogue Scale; FAOS:Foot and Ankle Outcome Score

# Introduction

The most common injury of musculoskeletal system which affects the lower limb in active people is an ankle sprain. It is defined as the ligaments tearing complete or partially or stretching of one or more of the ankle joint ligaments as a result of a sudden movement of twisting that crosses the normal limits of joint ROM [1]. Foot inversion and adduction with plantarflexion combined, along with the inefficiency of external lateral ligament is known to be the most common injury mechanism in sprain of the ankle, which also includes frequent impacts on the peroneal tendons of anterior side [2]. The anterior ligament can be ripped in rare situations, resulting in capsular injury and peroneal tendon rupture. By traumatic version the deltoid ligament might be damaged; while this kind of sprain is uncommon, the probability of injuries associated such as proximal or distal fibula fractures and

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fractures of talus are ought be seen [3]. Moreover, hyperdorsiflexion may cause syndesmotic ligament damage. Other anatomic structures may be affected, like muscles, nerves, tendons, bone and vascular vessels along with the ligaments [4].

Walking inability or inability to move a joint feeling of burning or ripping, worsening of pain with motion, change in color, and bruises fastly occurring are all the symptoms of an ankle sprain. The degree of these symptoms is determined on the severity of the sprain [5]. Surgical or conservative treatments are used to repair the structures and restore functioning after a sprain of ankle or in general. Grade I and II sprains are typically treated conservatively, whereas third grade lesions are usually surgically treated, however a conservative approach is occasionally regarded acceptable for the latter [6].

Immobilisation for short term or total immobilisation, local or systemic NSAIDs, cool packs, physical therapy, or with or without muscle contraction electrical stimulation are among the conservative therapies available. All have been studied for their efficacy in resolving or improving clinical symptoms of an ankle sprain, such as persistent swelling or the ability of the patient to return to work or to play sports [7]. These studies, however, have taken into account not only acute sprains, but also persistent ankle instability, as well as a combination of conservative and surgical therapies. None, to our knowledge, have explicitly addressed acute ankle sprain [8].

The ankle is one of the most often injured body parts, accounting for ten to thirty percent of all sports injuries in the Netherlands between 2000 and 2004. On average, one inversion ankle injury occurs per 10,000 people each day, resulting in about 5000 injuries in the UK and 23000 in the US [9].

Ankle sprains are one of the most common sports injuries. Awareness of position of foot being inadequate is considered to be a basic cause of these sports injuries of ankle. Ankle taping is supposed to lessen the risk of having injury by making improvements in awareness of foot position [10]. KT taping that is the use of tape that is elastic, has now in practice to be applied as an accepted intervention to treat numerous neuromuscular, sports-related, and orthopedic conditions.

In studies conducted earlier it is shown that the Kiniseo Tape improves the flow of blood, the lymph circulation, improves proprioception by stimulating cutaneous mechanoreceptors, assists muscle function relieves pain, and aids the required mechanical effects for the misalignment correction of the ankle joint [11]. Due to the poor adherence of tape to the human skin, the beneficence of taping decreases as the duration of exercise increases [12]. To prevent ankle sprains ankle taping has now become the major mean of avoiding injury in sports. Ankle injuries are familiar during sports and activities including sports and games. 85% of these injuries are ankle sprains [13]. Recurrence rates of ankle sprains are high and may cause chronic instability of ankle, tendon pathology of peroneous, osteoarthritis, anterior impingement of ankle which in turn requires therapy of prolonged time [14].

Thus, to prevent re occurring of sprain in ankle is the basic focus in treating it. Generally, taping of ankle by the use of tape which is non elastic and bracing are used to prevent further injury of ankle. Taping provides mechanical support to the ankle by restricting ankle ROM and by improving proprioception [15]. Taping treatments are popular in sports and are utilized in athlete rehabilitation for not only therapy but also to improve performance. Different approaches can be used to limit or facilitate mobility, as well as to stabilize a joint. There are two sorts of taping techniques: elastic and non-elastic [16]. Researchers looking into the taping technique's effectiveness (both elastic tape and non-elastic tape have found mixed outcomes in different people when it comes to reducing the risk of injuries in sports, swelling, myocardial pain syndrome, osteoarthritis, pain, muscle spasms, and to increase the muscle power and range of motion, along with the endurance of proper functionality and proper walking patterns [17]. Nevertheless, some studies which were done on the functional performance to study effects of taping in ankle using tape that is non elastic or using braces showed that interference is observed when normal functions were performed [18]. Postural balance is an important daily component of sport activities. Along with that the ROM of ankle when limited will affect the daily activities like walking, running, stair climbing and squatting. On the ankle ROM and the dynamic balance of subjects who did not have symptoms, with the help of anesthesiology tape, the effects of Ankle balance taping have not been studied in sufficiency [19].

Accordingly, the aim of this study was to look into the changes in the ankle dorsiflexion ROM while weight bearing and the dynamic balance of subjects who had no symptoms, after the applying of the different types of Ankle Balance Taping using the Kinesio tape [20]. According to its developer, Dr. Kenso Kase, Kinesio Tape is a therapeutic tape which has elastic properties being used to treat various amount of problems like injuries of sports, to increase healing and to decrease the discomfort. It is also used to increase the range of motion and boosting strength of the joint [21].

Kinesio tape, often known as kt tape, is a type of elastic tape that was invented by Kenzo Kase in 1996 and is used with an application method developed by him. The familiarity of TP tape and its extensive use grew as a result of its appearance on the bodies of numerous professional athletes at the 2008 olympic games [8]. According to Kase, kt tape should be able to improve the muscle's contracting capacity. Despite the tape method's recent popularity, there is insufficient evidence to hold up or refute the statements stated by Kase, et al. Due to the absence of solid data about the usage of kt tape, to continue to assess and study the effects on various groups of muscles with tape is recognized as critical [22].

An experimental study was conducted for observing if the taping of the lateral and anterior portions of the ankle joint using Kinesio tape will be able to improve proprioception of ankle when observed in comparison to an ankle which is untaped. An ankle RJPS apparatus was used to evaluate inversion of ankle with twenty degrees of plantar flexion and plantar flexion of Reproduction of Joint Position Sense (RJPS). In regards to the measurements of RJPS at the ankle in the movements of twenty degrees of plantar flexion with inversion and pure plantar flexion, the use Kinesio tape usage did not happen to improve proprioception (in RJPS) in persons who were healthy [23].

A study conducted by Sarvestan, Javadin 2020 according to this study during unilateral balancing tasks, the effects of ankle Kinesio-Taping (KT) on postural sway, lower limb ROM, and muscle activation were investigated. Acute administration of KT to athletes with chronic ankle instability might offer lateral mechanical support to the ankle, potentially reducing frontal plane sway velocity and muscle activation magnitude. The findings show that KT may be helpful in increasing static joint stability in those who have had a chronic ankle sprain, and so might be viewed as a safe way to go back into exercise [24].

With so many applications for taping in athletes, it is simply seen how it might be included in to the care of an athlete's to help them avoid injuries and improve performance. Goals of the following study were to see how Kinesio tape affected force generation in ankle evertors. Kinesio tape promises to enhance the evertor's strength of the ankle, enhancing stability of ankle in patients with the instability of ankle in chronic cases, according to this study. Physical therapists might use this information to help athletes return to exercise faster by allowing them to fulfill their strength objectives.

The rationale of this study is that we want to see that how much taping is beneficial for our society and how much weight bearing exercises are beneficial for chronic ankle sprain players. As we know that it is important for our society to give them a beneficial and true protocol of treatment.

#### **Hypothesis**

**Null hypothesis:** There will be no difference of weight bearing exercises on kinesio tape in ankle pain patients.

Alternate hypothesis: There will be difference of weight bearing exercises on kinesio tape in ankle pain patients.

# **Materials and Methods**

Study design was randomized control trial. Non-probability convenient sampling was done. And soccer players were assigned to each group through toss and trial method. Patients with chronic ankle pain were included in the study and data was collected from LDA sports complex, Lahore. It took more than 4 months to complete the study after the approval. Sample size was calculated through Epitool software with confidence level of 0.95 and power as 0.8 and the total sample size was calculated as 16 with both groups of 8 soccer players. Inclusion criteria was male and female gender, 17-40 years, patients who feel pain from more than 3 months and can bear weight bearing exercises. Exclusion criteria was any bony fracture, soft tissue tear, infection or kind of trauma. Data collection tools were VAS: (Visual Analog Scale) FAOS: (Foot Ankle Outcome Score). A new scale Visual Analogue Scale Foot and Ankle (VAS FA) was constructed: questionnaire based on 20 subjective questions, Rating based on Visual-Analogue-Scale (VAS). For validation SF 36 Form and Hannover Questionnaire (Q) were obtained and correlated with VAS FA.

#### **Treatment protocols**

For group A (With kinesio tape)

- After taking consent, participants were selected randomly.
- Participants were treated with kinesio tape in ankle to check the effect of weight bearing exercises.

#### Toe raises

Stand with your heel over the edge of a step. Raise up on the ball of your foot, hold for 3 seconds, and slowly lower your heel to the starting position. Perform 20 repetitions several times a day.

**Heel and toe walking:** Walk on your toes for 30 seconds. Switch and walk on your heels for 30 seconds. Build up to 1 minute on toes and heels alternating for 5 to 10 minutes. Perform several times per day.

Lateral step up and down: Step up sideways to a step bench and then step down sideways.

**One-leg balance:** Try to stand on one leg for 10 to 30 seconds. Increase the intensity by doing this with your eyes closed.

**One-leg squat:** Stand on the affected leg with your foot pointing straight ahead and the knee of the other leg slightly bent. Extend your arms for balance if necessary. Lift the non-supporting foot slightly off the floor and lower to a squat position.

**Step up onto balance board:** Place a balance board (or soft pillow or foam pad 6 to 8 inches higher than you're starting point. Step up 10 times.

**Balance board with half-squats:** While balancing on a wobble board, perform 10 slow, controlled half-squats.

For group B (without kinesio tape)

- Same protocol were given to participants as described above except kinesio tape was not applied on patients.
- Both the groups were compared to find out which treatment protocol has more effects on ankle with or without kinesio tape.

#### **Data collection procedure**

First screening was done for ankle sprain and mentioned criteria was included for consideration of patients for which grade 1 and 2 sprain patients were included where grade I: Stretch and/or minor tear of the ligament without laxity (loosening) grade II: Tear of ligament plus some laxity. Then randomization was done by lottery method. And two groups were assigned as group A and group B. Descriptive statistics were made of frequency tables, bar charts were used to show summary of group measurements measured over time through SPSS. Difference between groups and between variables within groups was calculated and Inter group difference and Intra group pre and post treatment values were evaluated with parametric tests, independent sample t test and paired t test.

# Results

Among 16 participants 9 (56.3%) were male and 7 (43.8%) were female. Among 16 participants, mean age was  $34 \pm 5.35$ with minimum 25 and maximum 40 years of age. Mean weight was  $68.5 \pm 5.83$  with minimum 58 and maximum 76 kg. Mean height was  $166 \pm 11.65$  cm with minimum 152 and maximum 190 cm. Mean body mass index was  $25.25 \pm 4.38$ with minimum 18.8 and maximum 32.50. Applying independent sample t test among these total participants, pretreatment visual analogue scale mean in experimental group was  $7.37 \pm 1.06$  and in control group was  $6.75 \pm 1.03$  with P value 0.253 which means that there is no significant difference between the mean values of both groups. Posttreatment visual analogue scale mean in experimental group was  $4.5 \pm 1.19$  and in control group was  $3.25 \pm 1.28$  with P value 0.063 which means that there is significant difference between the mean values of both groups. And while applying paired sample test among 16 participants, pre-treatment visual analogue scale was  $7.06 \pm 1.06$  and post-treatment visual analogue scale mean was  $3.87 \pm 1.36$  with P Value 0.00 which means that there is significant difference between the mean values of pre-treatment and post treatment visual analogue scale.

Independent sample t test for SF-36 was applied among 16 participants. Pre treatment Physical Function (PF) mean in experimental group was  $42 \pm 8.07$  and in control group was  $43 \pm 8.94$  with P Value 0.818 which means that there is no significant difference between the mean values of both groups. Post-Treatment Physical Function (PF) mean in experimental group was  $61.25 \pm 8.22$  and in control group was  $45.75 \pm 12.37$  with P Value 0.011 which means that there is significant difference between the mean values of both groups. Pre-treatment Social Function (SC) mean in experimental group was  $45.5 \pm 9.69$  and in control group was  $38.62 \pm 5.82$  with P Value 0.108 which means that there is no significant difference between the mean values of both groups. Post-treatment Social Function (SC) mean in experimental group was  $70.25 \pm 11.59$  and in control group was  $42.62 \pm 17.12$  with P Value 0.002 which means that there is significant difference between the mean values of both groups. Pre-treatment Mental Health (MH) mean in

experimental group was  $47.5 \pm 3.81$  and in control group was  $45 \pm 3.20$  with P Value 0.178 which means that there is no significant difference between the mean values of both groups. Post-treatment Mental Health (MH) mean in experimental group was  $75.25 \pm 8.82$  and in control group was  $47.37 \pm 8.46$  with P Value 0.00 which means that there is significant difference between the mean values of both groups. Pre-treatment Pain (P) mean in experimental group was  $50.25 \pm 6.43$  and in control group was  $46.25 \pm 4.65$  with P Value 0.176 which means that there is no significant difference between the mean values of both groups. Posttreatment Pain (P) mean in experimental group was 73 ± 11.36 and in control group was  $47.25 \pm 7.20$  with P Value 0.00 which means that there is significant difference between the mean values of both groups. Pre-treatment Change in Health (CiH) mean in experimental group was 49.75 ± 5.14 and in control group was 47.37  $\pm$  5.82 with P Value 0.402 which means that there is no significant difference between the mean values of both groups. Post-treatment Change in Health (CiH) mean in experimental group was 78.5 ± 7.61 and in control group was  $51.25 \pm 14.88$  with P Value 0.00 which means that there is significant difference between the mean values of both groups. Pre-treatment Role Limitation Physical (RLP) mean in experimental group was  $50.25 \pm 6.86$ and in control group was  $49.12 \pm 7.62$  with P Value 00.761 which means that there is no significant difference between the mean values of both groups. Post-treatment Role limitation Physical (RLP) mean in experimental group was 79.5  $\pm$  3.58 and in control group was 51.75  $\pm$  12.66 with P Value 0.00 which means that there is significant difference between the mean values of both groups. Pre-treatment Role Limitation Mental (RLM) mean in experimental group was  $41.25 \pm 14.89$  and in control group was  $37.87 \pm 11.49$  with P Value 0.62 which means that there is no significant difference between the mean values of both groups. Post-treatment Role limitation Mental (RLM) mean in experimental group was  $72.5 \pm 11.91$  and in control group was  $40.5 \pm 18.70$  with P Value 0.001 which means that there is significant difference between the mean values of both groups. Pre-treatment Energy Vitality (EV) mean in experimental group was 49.25± 7.61 and in control group was  $49.25 \pm 7.77$  with P Value 1.00 which means that there is no significant difference between the mean values of both groups. Post-treatment Energy/ Vitality (EV) mean in experimental group was  $81.5 \pm 10.94$ and in control group was  $53.62 \pm 17.35$  with P Value 0.002 which means that there is significant difference between the mean values of both groups. And Pre-treatment Health Perceptions (HP) mean in experimental group was 52.25  $\pm$ 9.92 and in control group was 50.25  $\pm$  7.44 with P Value 0.655 which means that there is no significant difference between the mean values of both groups. Post-treatment Health Perceptions (HP) mean in experimental group was 70  $\pm$  9.41 and in control group was 51.87  $\pm$  11.93 with P Value 0.005 which means that there is significant difference between the mean values of both groups.

Paired sample t test was applied on Sp-36 among all 16 participants, Pre-treatment Physical Function (PF) was 42.50  $\pm$  8.24 and Post-treatment Physical Function (PF) mean was

 $53.50 \pm 12.92$  with P Value 0.002 which means that there is significant difference between the mean values of pretreatment and post treatment Physical Function (PF). Among 16 participants, Pre-treatment Social Function (SC) was  $42.06 \pm 8.50$  and Post-treatment Social Function (SC) mean was  $56.43 \pm 20.07$  with P Value 0.001 which means that there is significant difference between the mean values of pretreatment and post treatment Social Function (SC). Pretreatment Mental Health (MH) was 46.25 ± 3.64 and Posttreatment Mental Health (MH) mean was  $61.31 \pm 16.64$  with P Value 0.001 which means that there is significant difference between the mean values of pre-treatment and post treatment Mental Health (MH). Pre-treatment Pain (P) was  $48.25 \pm 5.80$  and Post-treatment Pain (P) mean was  $60.12 \pm$ 16.16 with P Value 0.004 which means that there is significant difference between the mean values of pretreatment and post treatment Pain (P). Pre-treatment Change in Health (CiH) was  $48.56 \pm 5.45$  and Post-treatment Change in Health (CiH) mean was  $64.87 \pm 18.12$  with P Value 0.001 which means that there is significant difference between the mean values of pre-treatment and post treatment Change in Health (CiH). Pre-treatment Role Limitation Physical (RLP) was  $49.68 \pm 7.03$  and Post-treatment Role Limitation Physical (RLP) mean was  $65.62 \pm 16.91$  with P Value 0.001 which means that there is significant difference between the mean values of pre-treatment and post treatment Role Limitation Physical (RLP). Pre-treatment Role Limitation Mental (RLM) was  $39.56 \pm 12.97$  and Post-treatment Role Limitation Mental (RLM) mean was  $56.50 \pm 22.42$  with P Value 0.001 which means that there is significant difference between the mean values of pre-treatment and post treatment Role limitation Mental (RLM). Pre-treatment Energy/Vitality (EV) was 49.25  $\pm$  7.43 and Post-treatment Energy/Vitality (EV) mean was 67.56  $\pm$  20.08 with P Value 0.001 which means that there is significant difference between the mean values of pretreatment and post treatment Energy/Vitality (EV). Pretreatment Health Perceptions (HP) was 51.25  $\pm$  8.53 and Posttreatment Health Perceptions (HP) mean was 60.93  $\pm$  13.97 with P Value 0.002 which means that there is significant difference between the mean values of pre-treatment and post treatment Health Perceptions (HP).

Independent sample t test was applied for foot and ankle outcome score. Among 8 participants, pre-treatment foot and ankle outcome score mean in experimental group was  $41.25\pm 14.89$  and in control group was  $37.87 \pm 11.49$  with P Value 0.62 which means that there is no significant difference between the mean values of both groups. Post-treatment foot and ankle outcome score mean in experimental group was  $72.5 \pm 11.91$  and in control group was  $40.5 \pm 18.70$  with P Value 0.001 which means that there is significant difference between the mean values of both groups.

Paired sample t test was applied for foot and ankle outcome score. Among 16 participants, Pre-treatment foot and ankle outcome score was  $46.25 \pm 5.80$  and Post-treatment Foot and ankle outcome score mean was  $62.12 \pm 16.16$  with P Value 0.004 which means that there is significant difference between the mean values of pre-treatment and post treatment foot and ankle outcome score (Tables 1-7).

	Table 1: Descriptive statistics of age, weight, height and body mass index.					
	Descriptive Statistics					
	Ν	Minimum	Maximum	Mean	Std. Deviation	
Age	16	25	40	34	5.35	
Weight (kg)	16	58	76	68.5	5.83095	
Height (cm)	16	152	190	166	11.65619	
Body Mass Index	16	18.8	32.5	25.25	4.38497	

Table 2: Independent sample T test for visual analogue scale.

	Independent Sa	ample T Test for Visual	Analogue Scale	
	Groups	Ν	Mean ± Std. Deviation	P Value
Pre Treatment Visual Analogue Scale	Experimental Group	8	7.37 ± 1.06	0.253
-	Control Group	8	6.75 ± 1.03	
Post Treatment Visual	Experimental Group	8	4.5 ± 1.19	0.063
, maiogue eouie	Control Group	8	3.25 ± 1.28	

Table 3: Paired samples statistics for visual analogue scale.

Paired Samples Statistics For Visual Analogue Scale

	Ν	Mean ± Std. Deviation	Std. Error Mean	P Value
Pre Treatment Visual Analogue Scale	16	7.06 ± 1.06	0.26566	0
Post Treatment Visual Analogue Scale	16	3.87 ± 1.36	0.34004	

Table 4: Independent sample T test for SF-36.						
Independent Sample T Test						
	Groups	Ν	Mean ± Std. Deviation	P Value		
Pre Treatment Physical Function (PF)	Experimental Group	8	42 ± 8.07	0.818		
	Control Group	8	43 ± 8.94			
Post Treatment Physical Function (PF)	Experimental Group	8	61.25 ± 8.22	0.011		
	Control Group	8	45.75 ± 12.37			
Pre Treatment Social	Experimental Group	8	$45.5 \pm 9.69$	0.108		
	Control Group	8	38.62 ± 5.82			
Post Treatment Social	Experimental Group	8	70.25 ± 11.59	0.002		
	Control Group	8	42.62 ± 17.12			
Pre Treatment Mental Health (MH)	Experimental Group	8	47.5 ± 3.81	0.178		
	Control Group	8	45 ± 3.20			
Post Treatment Mental	Experimental Group	8	75.25 ± 8.82	0		
	Control Group	8	47.37 ± 8.46			
Pre Treatment Pain (P)	Experimental Group	8	50.25 ± 6.43	0.176		
	Control Group	8	46.25 ± 4.65			
Post Treatment Pain (P)	Experimental Group	8	73 ± 11.36	0		
	Control Group	8	47.25 ± 7.20			
Pre Treatment Change in health (CiH)	Experimental Group	8	49.75 ± 5.14	0.402		
	Control Group	8	47.37 ± 5.82			
Post Treatment Change in	Experimental Group	8	78.5 ± 7.61	0		
	Control Group	8	51.25 ± 14.88			
Pre Treatment Role	Experimental Group	8	$50.25 \pm 6.86$	0.761		
	Control Group	8	49.12 ± 7.62			
Post Treatment Role	Experimental Group	8	79.5 ± 3.58	0		
	Control Group	8	51.75 ± 12.66			
Pre Treatment Role	Experimental Group	8	41.25 ± 14.89	0.62		
	Control Group	8	37.87 ± 11.49			
Post Treatment Role	Experimental Group	8	72.5 ± 11.91	0.001		
	Control Group	8	40.5 ± 18.70			

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Pre Treatment Energy /	Experimental Group	8	49.25 ± 7.61	1
	Control Group	8	49.25 ± 7.77	
Post Treatment Energy / Vitality (EV)	Experimental Group	8	81.5 ± 10.94	0.002
	Control Group	8	53.62 ± 17.35	
Pre Treatment Health	Experimental Group	8	52.25 ± 9.92	0.655
	Control Group	8	50.25 ± 7.44	
Post Treatment Health	Experimental Group	8	70 ± 9.41	0.005
	Control Group	8	51.87 ± 11.93	

# Table 5: Paired sample T test for SF-36.

Paired Samples Statistics							
		N	Mean ± Std. Deviation	Std. Error Mean	P Value		
Pair 2	Pre Treatment Physical Function (PF)	16	42.50 ± 8.24	2.06155	0.002		
	Post Treatment Physical Function (PF)	16	53.50 ± 12.92	3.23136			
Pair 3	Pre Treatment Social Function (SC)	16	42.06 ± 8.50	2.12616	0.001		
	Post Treatment Social Function (SC)	16	56.43 ± 20.07	5.01993			
Pair 4	Pre Treatment Mental Health (MH)	16	46.25 ± 3.64	0.91059	0.001		
	Post Treatment Mental Health (MH)	16	61.31 ± 16.64	4.16105			
Pair 5	Pre Treatment Pain (P)	16	48.25 ± 5.80	1.45057	0.004		
	Post Treatment Pain (P)	16	60.12 ± 16.16	4.04132			
Pair 6	Pre Treatment Change in health (CiH)	16	48.56 ± 5.45	1.36311	0.001		
	Post Treatment Change in health (CiH)	16	64.87 ± 18.12	4.53126			
Pair 7	Pre Treatment Role limitation - Physical (RLP)	16	49.68 ± 7.03	1.75765	0.001		
	Post Treatment Role limitation - Physical (RLP)	16	65.62 ± 16.91	4.22973			
Pair 8	Pre Treatment Role limitation - Mental (RLM)	16	39.56 ± 12.97	3.2429	0.001		
	Post Treatment Role limitation - Mental (RLM)	16	56.50 ± 22.42	5.60506			
Pair 9	Pre Treatment Energy / Vitality (EV)	16	49.25 ± 7.43	1.85854	0.001		
	Post Treatment Energy / Vitality (EV)	16	67.56 ± 20.08	5.02242			
Pair 10	Pre Treatment Health perceptions (HP)	16	51.25 ± 8.53	2.13405	0.002		

Pc	ost Treatment Health perceptions (HP)	16 60.93	3 ± 13.97 3.4946	
	Table 6: Indepen	ident sample T test for foot and	I ankle outcome score.	
		Independent Sample T Te	est	
	Groups	Ν	Mean ± Std. Deviation	P Value
Pre Treatment Foot and Ankle Outcome Score	Experimental Group	8	41.25 ± 14.89	0.62
	Control Group	8	37.87 ± 11.49	
Post Treatment Foot and Ankle Outcome Score	Experimental Group	8	72.5 ± 11.91	0.001
	Control Group	8	40.5 ± 18.70	
	Table 7: Paire	d sample I test for foot and an	kie outcome score.	
	Paired Sa	mple T Test for Foot and Ankle	Outcome Score	
Groups	Ν	Mean ± Std. Deviation	Std. Error Mean	P Value
Pre Treatment Foot and Ankle Outcome Score	16	46.25 ± 5.80	1.45057	0.003

62.12 ± 16.16

#### **Discussion**

16

Post Treatment Foot and

Ankle Outcome Score

Among 16 participants 9 (56.3%) were male and 7 (43.8%) were female. Among 16 participants, mean age was  $34 \pm 5.35$  with minimum 25 and maximum 40 years of age. Mean weight was  $68.5 \pm 5.83$  with minimum 58 and maximum 76 kg. Mean height was  $166 \pm 11.65$  cm with minimum 152 and maximum 190 cm. Mean body mass index was  $25.25 \pm 4.38$  with minimum 18.8 and maximum 32.50.

A study conducted by Rashi Goel in 2014. Study aimed to compare the effect of Kinesio taping and athletic taping on pain. According to this study Pain on the Visual Analogue Scale (VAS) score comparison between kinesio and sports taping VAS stands for Visual Analogue Scale. 1-VAS before taping, 2-VAS just after recording, and 3-VAS 30 minutes after taping. In this study, individuals with lateral epicondylalgia found that both kinesio and athletic taping reduced pain and increased muscular function immediately and after 30 minutes of application. This result might have therapeutic implications in that kinesio tape could be utilized to support a pain-free rehabilitation regimen. In this research, the average reduction in pain following diamond taping was 20% (p=0.001). PPT increased by 25.7 percent on average (p=0.000). The average gain in pain-free grip strength was 23% (p=0.000). It's thought to be due to a direct mechanical influence on the forearm muscles, similar to what orthotic braces for this disease are supposed to do but haven't been shown to do. According to our study Among 16 participants, Pre-treatment visual analogue scale mean in experimental group was  $7.37 \pm 1.06$  and in Control group was  $6.75 \pm 1.03$ with P Value 0.253 which means that there is no remarkable variation among the mean values of both groups. Posttreatment Visual Analogue Scale mean in experimental group

was  $4.5 \pm 1.19$  and in control group was  $3.25 \pm 1.28$  with P Value 0.063 which means that there is marked variability among the mean values of both groups [25].

4.04132

A study conducted by nehal tazel in 2020 according to this study physical function mean of group 1 was  $34.92 \pm 20.36$  and group 2 mean was  $39.52 \pm 19.86$  with P Value 0.122 and according to our study Among 16 participants, Pre-treatment Physical Function (PF) was  $42.50 \pm 8.24$  and Post-treatment Physical Function (PF) mean was  $53.50 \pm 12.92$  with P Value 0.002 which means that there is markable variation among the mean values of pre-treatment and post treatment Physical Function (PF) [26].

Social functioning mean of group 1 was  $41.73 \pm 26.47$  and group 2 mean was  $40.59 \pm 14.84$  with P Value 0.981 and according to our study Among 16 participants, Pre-treatment Social Function (SC) mean in experimental group was  $45.5 \pm$ 9.69 and in control group was  $38.62 \pm 5.82$  with P Value 0.108 which means that there is no remarkable variation among the mean values of both groups. Post-treatment Social Function (SC) mean in experimental group was 70.25  $\pm$ 11.59 and in Control group was  $42.62 \pm 17.12$  with P Value 0.002 which means that there is absolute variability among the mean values of both groups. Physical role limitation Mean of group 1 was  $18.05 \pm 20.36$  and group 2 mean was  $17.15 \pm 12.40$  with P Value 0.846 and according to our study Among 16 participants, Pre-treatment Role Limitation Physical (RLP) mean in experimental group was  $50.25 \pm 6.86$ and in Control group was  $49.12 \pm 7.62$  with P Value 00.761 which means that there is no absolute variation among the mean values of both groups. Post-treatment Role Limitation Physical (RLP) mean in experimental group was  $79.5 \pm 3.58$ group was  $51.75 \pm 12.66$  with P and in control

Value 0.00 which means that there is remarkable variation among the mean values of both groups [26].

Among 16 participants, Pre-treatment Health perceptions (HP) mean in experimental group was  $52.25 \pm 9.92$  and in Control group was  $50.25 \pm 7.44$  with P Value 0.655 which means there is no relative or remarkable variation among the mean values of both groups. Post-treatment Health perceptions (HP) mean in experimental group was  $70 \pm 9.41$ and in Control group was  $51.87 \pm 11.93$  with P Value 0.005 which means that there is significant difference between the mean values of both groups [27]. Emotional role limitation Mean of group 1 was  $22.66 \pm 20.37$  and group 2 mean was  $23.46 \pm 17.55$  with P Value 0.715 and according to our study among 16 participants, Pre-treatment Role limitation mental (RLM) mean in experimental group was  $41.25 \pm 14.89$  and in Control group was  $37.87 \pm 11.49$  with P Value 0.62 which means that there are no significant changes seen among the mean values of both groups. Post-treatment Role Limitation Mental (RLM) mean in experimental group was  $72.5 \pm 11.91$ and in Control group was  $40.5 \pm 18.70$  with P Value 0.001 which means that there are significant changes among the mean values of both groups.

Cyntia J Wright et al., conducted a controlled trial research in 2017 which states that Mental Health Mean of group 1 was  $36.91 \pm 19.13$  and group 2 mean was  $37.11 \pm 7.61$  with P Value 0.914 and according to our study Among 16 participants, Pre-treatment Mental Health (MH) mean in experimental group was  $47.5 \pm 3.81$  and in Control group was  $45 \pm 3.20$  with P Value 0.178 which means that there is no significance seen among the mean values of both groups. Post-treatment Mental Health (MH) mean in experimental group was  $75.25 \pm 8.82$  and in Control group was  $47.37 \pm$ 8.46 with P Value 0.00 which means that there is significant difference between the mean values of both groups Energy Mean of group 1 was  $36.93 \pm 16.36$  and group 2 mean was  $31.19 \pm 12.58$  with P Value 0.097 and according to our study Among 16 participants, Pre-treatment Energy/Vitality (EV) mean in experimental group was  $49.25 \pm 7.61$  and in Control group was  $49.25 \pm 7.77$  with P Value 1.00 which means that there is no significant difference between the mean values of both groups. Post-treatment Energy/Vitality (EV) mean in experimental group was  $81.5 \pm 10.94$  and in control group was  $53.62 \pm 17.35$  with P Value 0.002 which means that there are significant changes among the mean values of both groups. Pain Mean of group 1 was  $25.20 \pm 21.42$  and group 2 mean was  $26.36 \pm 19.46$  with P Value 0.619 and according to our study Among 16 participants, Pre-treatment Pain (P) mean in experimental group was  $50.25 \pm 6.43$  and in Control group was  $46.25 \pm 4.65$  with P Value 0.176 which means that there are absolute changes seen among the mean values of both groups. Post-treatment Pain (P) mean in experimental group was  $73 \pm 11.36$  and in Control group was  $47.25 \pm 7.20$ with P Value 0.00 which means there are significant changes seen among the mean values of both groups [28]. Hence, research supports the results of our current study. But this previous research was compromising general population instead of athletes alone.

As studied from different articles and literature this study was different to previous studies or research as it showed how much weight bearing is important in chronic ankle sprain along with the use of kinesio tape.

## Conclusion

There was significant difference between the mean value of visual analogue Scale, SF-36 and Foot and ankle outcome Score, Pre Treatment and after treatment. Significant difference was also found between the Treatment group and control group in the favor of treatment group with kinesiotape. The study should be conducted on a larger sample for future purpose with a decline in the drop-out rate to assess these results. For more precise study, follow-up sessions should verify the long-term results of treatments.

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