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Is add- on effect of kinesio-taping in ankle sprain-victims, improve sport performance?

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ABSTRACT: Several interventions have been recommended in the management of acute ankle sprains including rest, ice, compression, and elevation (RICE), analgesic and anti-inflammatory medications, tapping, bracing and mobilization, early weight-bearing and walking aids, manual therapy, exercise therapy, Electro physical modalities. The range of motion, stretching, strengthening, neuromuscular, proprioceptive, and sport-specific activities should all be included in an exercise programme. Athletes may still experience ongoing post-sprain ankle issues, such as discomfort, weakness, edema, and instability. Physical therapy for a mild ankle sprain aims to reduce pain and swelling while safeguarding the joint and its ligaments from further damage. Typically, it takes a patient between 5 and 14 days to recover. For a acute ankle sprain, physical therapy aims to reduce swelling and pain while regaining stability and functional movement. The purpose of this study was to verify whether kinesio-taping (KT) intervention with traditional exercises can help improving the pain and functional status following ankle sprain in the patient with basketball player

INTRODUCTION

Injury to the soft tissues is the main feature of ankle joint dysfunction. One or more ankle joints are momentarily distracted from their positions during the distortion movement. It is categorized as the LE's most frequent injury and is sometimes referred to as an ankle sprain. The most frequent cause of distortion is an unanticipated quick step onto an uneven surface or a swift direction shift when rapid rotation takes place. The lateral side of the foot, as well as soft tissues including tendons, ligaments, and muscles, are stressed in both situations, which results in a reflex that pulls on the joint capsule. The two types of treatment such as conservative and surgical; could be separated into two [1]. Sports like football, football and basketball that require quick starts, stops and directional changes frequently result in lateral ankle sprains. Side effects from lateral ankle sprains may cause athletes to stop playing their chosen sport, especially if they sustain the injury, and they may also have an impact on their long-term lifestyle and health. Acute ankle inversion sprains are commonly treated at home with rest, ice, compression, elevation, bracing or splinting, and painkillers. Rehabilitative techniques, such as active range of motion exercises and strengthening programmes are frequently used as the healing process advances Furthermore, manual therapy has been shown to be successful in regaining dorsiflexion. Athletes may continue to have post-sprain ankle issues, such as discomfort, weakness, swelling, and instability, despite their best efforts. [2]. Home-based rest, ice, compression, elevation, bracing or splinting, and pain medication are all widely approved treatments for acute ankle inversion sprains. Rehabilitation techniques like active range of motion exercises and strengthening programmes are frequently used as the healing process advances additionally; manual therapy has proven successful in regaining dorsiflexion. Athletes may still experience ongoing post-sprain ankle issues, such as discomfort, weakness, edema, and instability. The tough bands of tissue (ligaments) that encircle and link the bones of the leg to the foot are hurt when an ankle is sprained. Usually, the injury results from unintentionally

twisting or turning your ankle awkwardly. The ligaments holding your ankle bones and joints together may be stretched or torn as a result. The most frequent injury in the ankle joint, which is the second most probable joint to be hurt when playing sports, is an ankle sprain. The anterior talofibular ligament (ATFL) is the ligament that sustains damage the most frequently for the lateral ankle ligament complex. When a plantar-flexed foot is violently inverted, the ATFL and Calcaneofibular ligament (CFL) are sprained. This suggests that the posterior Talofibular Ligaments (PTFL) and the Calcaneofibular Ligaments (CFL) are less likely to be subjected to harmful loads in this instance. Rarely is the PTFL damaged unless a talus dislocation is involved. Forceful pronation and rotation movements of the hind foot can injury the strong, deltoid ligament complex on the medial side, which is made up of the posterior Tibiotalar (PTTL), Tibiocalcaneal (TCL), Tibionavicular (TNL), and anterior Tibiotalar ligaments (ATTL). The distal stabilising ligaments the inferior transverse ligament, the interosseous membrane, the anterior-inferior, posterior-inferior, and transverse tibio-fibular ligaments make up the tibio-fibular syndesmosis. A syndesmotic (high ankle) sprain develops when the ankle is dorsiflexed while the leg is also rotated externally. [3] Dr. Kenzo Kase invented the therapeutic taping method known as kinesio taping (KT) in the 1970s. Due to its elastic nature, quick drying time, and ability to be applied to the skin for up to five days, KT is thought to be more patient-friendly and cost-effective than conventional taping and bracing. It has been applied in clinical settings as an alternative to standard tape for the treatment of a range of ankle problems, such as sprained ankles, inflamed ankle tendons, strained ligaments, or general ankle weakness. The manufacturer suggests that KT can be used in the rehabilitation of ankle injuries and the management of ankle sprains by supporting injured muscles and joints, lowering discomfort, changing muscle function, strengthening Proprioception, improving circulation, and realigning subluxed joints [4] Stretching - Stretching is the most popular method for improving DFROM and is a crucial component of both recovery and training regimens. Stretching can help you become more flexible over time, which in turn seems to improve muscular performance and lessen the effects of exercise-induced muscle soreness. Static stretching (SS), proprioceptive neuromuscular facilitation (PNF), and ballistic stretching (BS) are the three basic types of stretching.[5] Stability - The nervous system uses feed-forward and feedback systems to regulate body posture and movement. It is generally known that the feed forward mechanism, which uses the senses of sight, hearing, and touch as well as past experience and internal models to maintain body position and movement, typically controls the dynamic stability of the ankle joint. In patients with chronic ankle instability, the changes in neuromuscular control may have an impact on postural stability. Proprioception, neuromuscular control, and the integration of somatosensory, visual, and vestibular afferent information are all necessary for postural stability, which is the capacity to maintain the centre of mass within the base of support. Proprioception and the operation of the joint mechanical receptors can both be enhanced by these workouts. The stability and performance of people with FAI, Kinesio taping (KT) and other forms of external supports, such as braces, can be used in conjunction with exercise therapy to great benefit. KTs are cotton strips that can stretch several times their original length and are very compatible with the skin. These tapes relieve muscle fatigue, improve blood circulation, lessen edema and swelling, increase range of motion, relieve pain, and raise joint awareness in addition to being inexpensive, convenient, and accessible. [6] Strengthening- The ankle and core are crucial structural components of the body. The previous study, however, only looked at static balance and strength perception after wearing the Thera-Band to enhance the ankle and core muscles. Although research on the effectiveness of strength training activities utilizing Thera-Band for static and dynamic balance are limited, it is necessary for the body to have strong ankle and core muscles. To examine the effects of progressive core and ankle muscle strengthening exercises on balance using Thera-Band, as well as to identify an activity utilizing Thera-Band that is simple to manage load strength and can be utilized in rehabilitation treatment, this study compares the effects of these exercises. **Ankle muscle strengthening**- The exercises "Dorsiflexion", "Plantar Flexion", "Inversion", and "Eversion" were carried out by the ASG. In the "Inversion" and "Eversion" scenarios, the examiner offers assistance by securing the participant's leg to avoid compensating other joints and muscles during ankle movement. One set consisted of 40 exercises that covered all four types of movement, and three or four sets were carried out to account for gradual movement. On both ankles, these workouts were equally carried out. Dorsiflexion The participant pulls the foot of the ankle towards the head while seated and with both legs erect, despite the force of the Thera-Band being stretched out in front of them. Plantar Flexion The participant presses the foot of the ankle downward against the force of the stretched Thera-Band while sitting with both legs straightened and the Thera-Band wrapped around the metatarsal bones. Inversion Thera-Band is wrapped around the metatarsal bone while the

participant is seated with both legs straightened. The ankle is then turned inward against the force of the Thera-Band that is stretched to one side. Eversion In a seated position with both legs extended, the user wraps the Thera-Band around the metatarsal bone before turning the ankle outward against the pull of the Thera-Band that is bent to one side. [7] MOBILIZATION Ankle sprains are among the most frequent musculoskeletal injuries, with a high likelihood of recurrence and lingering symptoms. This results in chronic ankle instability (CAI), which is characterized by discomfort, edoema, and muscle atrophy around the ankle joint. In a study of muscle activity patterns, patients with functional ankle instability had a later beginning of muscle activation in the tibialis anterior and peroneus longus than healthy adults. These findings show that ankle instability is caused by a deficiency in the ankle's peripheral reflex stability. [8]

METHODOLOGY-

FUNCTIONAL SCALE-foot ankle ability 8 point sport scale (total 8*4=32 points)

A self-report outcome tool called the Foot and Ankle Ability Measure (FAAM) was created to evaluate physical function in people with foot and ankle-related disabilities. There are translations of this self-report outcome tool available in Persian, English, German, and French. A 29-item questionnaire called the Foot and Ankle Ability Measure is broken down into two subscales: the Foot and Ankle Ability Measure and the 21-item Activities of Daily Living Subscale. The Sports subscale, a population-specific subscale created for athletes, evaluates more challenging tasks that are necessary for athletics.

Table-1 for functional scale

FUNCTIONS	**PRE**	**POST**
1 - RUNNING	0 (UNABLE TO DO)	+3 (SLIGHT DIFFICULTY)
2- JUMPING	0 (UNABLE TO DO)	+3 (SLIGHT DIFFICULTY)
3 – LANDING	0 (UNABLE TO DO)	+3 (SLIGHT DIFFICULTY)
4 - STARTING AND STOPPING QUICKLY	0 (UNABLE TO DO)	+4 (NO DIFFICULTY AT ALL)
5 - CUTTING / LATERAL MOVEMENTS	0 (UNABLE TO DO)	+4 (NO DIFFICULTY AT ALL)
6 – ABILITY TO PERFORM ACTIVITY WITH YOUR NORMAL TECHNIQUE	0 (UNABLE TO DO)	+3 (SLIGHT DIFFICULTY)
7–ABILITY TO PARTICIPATE IN YOUR DESIRED SPORT AS LONG AS YOU WOULD LIKE	0 (UNABLE TO DO)	+3 (SLIGHT DIFFICULTY)

TOTAL SCORE – 23 OUT OF 28

Table-2 for strength grading

Motion	Patient Position	Start Position	End Position
Plantar flexion (Gastronomies and Soleus in standing position)	Patient stands with extended knee on test limb. A table or other external surface may be used by the patient to balance themselves by placing one or two fingers on it. The therapist should be seated or standing with a side view of the test limb. Patient performs a full range of plantar flexion while actively lifting their heel off the ground 20 times in a row without stopping or getting tired 0		
Plantar flexion (Soleus only in standing position)	Patient stands on test limb with knee slightly flexed. One or two fingers may be used to assist with balance. Therapist stands or sits with a lateral view of test limb. Patient actively raises heel from floor 20 consecutive times without rest or great fatigue through full range of plantar flexion.		
Neutral Dorsi flexion (Tibialis Anterior, Extensor Digitorum Longus, Peroneus Tertius, Extensor Hallicus Longus)	Patient is short sitting with ankle plantar flexed. Therapist sits on stool in front of patient and uses one hand to stabilize the leg just above the malleoli. The other hand is used for resistance by placing it on the dorsal aspect of the foot. Patient actively dorsi flexes against resistance.		
Inversion	The patient is little and seated with a minor plantar flexion of the ankle. With one hand, the therapist stabilizes the ankle just above the malleoli while seated in front of or to the side of the test limb. The opposing hand contours over the dorsum and medial side of the foot at the level of the metatarsal heads to offer resistance. While the patient aggressively inverts their foot, there is resistance that is focused on eversion and minimal dorsi flexion.		
Inversion with dorsiflexion	Patient may be supine or short seated. The patient's heel is resting on the therapist's leg as they both sit on a stool in front of each other. While the other hand offers resistance over the dorsomedial portion of the foot, the other hand stabilizes the posterior leg just above the malleoli. Patient maintains relaxed toes while vigorously dorsiflexing ankle and inverting foot.		

Eversion	Patient may be short sitting or supine. They are both seated on stools in front of each other, the patient's heel resting on the therapist's calf. The second hand stabilizes the posterior leg just above the malleoli while providing resistance over the dorsomedial region of the foot. The patient does forceful dorsi flexion of the ankle and foot inversion while maintaining relaxed toes.		
Eversion with plantar flexion	Patient is petite and seated with the ankle straight. The therapist is in front of the patient, seated on a stool. While the other hand provides resistance on the dorsum and lateral edge of the forefoot, the other hand stabilizes the ankle slightly above the malleoli with one hand. Inversion and modest dorsiflexion are the areas of resistance. Patient actively depresses and extends the foot.		

Case description-

A case with 25 years old male attended the OPD of physiotherapy at RAMA University, Kanpur, and Uttar Pradesh India. Subject got injured while playing Basketball; meanwhile he was landing on the court through both the feet. He fell down on the court at that time immediately, since his right ankle was bent. Client was unable to bear body weight on right foot. After that patient was on medicine for two days, however pain was still severe. Again he joined the orthopaedic for their problem; doctor prescribed medicine for 3 days and advised for physiotherapy treatment. Orthopaedic diagnosed the subject as victim with ankle sprain, recommended to do rest for 3 days and not to take weight on affected side. Some swelling and tenderness were noted over right ankle on lateral aspect. Physiotherapist performed physical test to assess the problem. RICE principle was followed to manage the initial acute stage. Some gentle exercises in terms of strengthening, ROM and ankle pumping with others were given. Kinesio-taping was also applied around ankle joint with focus on lateral aspect of it.

Case was seen for 21 days, when progressive course of rehabilitation was performed to overcome the issues after ankle sprain. After treatment patient was able to do intensive activities for sports without pain and discomfort.

PAIN SCALE- Visual analogue scale (VAS) SCALE

PAIN SCORE 0-10 NUMBER RATING, 0-10 NUMERICAL RATING SCALE

Pre treatment score

1 2 3 4 5 6 7 8 ***9*** 10

NO PAIN moderate pain WORST POSSIBLE PAIN

Post treatment score

0 1 2 3 4 5 6 7 8 9 10

NO PAIN moderate pain WORST POSSIBLE PAIN

Table-3 ROM pretreatment

MOVEMENT (IN DEGREE)	**LEFT FOOT (NON – AFFECTED)**		**RIGHT FOOT (AFFECTED)**	
	ACTIVE	**PASSIVE**	**ACTIVE**	**PASSIVE**
PLANTER FLEXION	0-45	0-50	0-45 (PAINFULL)	0-50
DOSRI FLEXION	0-25	0-30	0-25 (PAINFULL)	0-25
ENVERSION	0-25	0-30	0-20 (PAINFULL)	0-20
INVERSION	0-25	0-50	0-50	0-50

FUNCTIONAL EVALUATION – Having difficulty on weight bearing activity.

SPECIAL TEST – Talar tilt test – **positive**

Anterior drawer test – **positive**

INVESTIGATION – Stress X rays

MRI – show the ligament injury

PHYSIOTHERAPY MANAGEMENT

TREATMENT PROTOCOL:-

REST ICE COMPRESSION AND ELEVATION (RICE)

Rest, ice, compression, and elevation (RICE) methods have traditionally been used for patients with ankle sprain, as they are for many acute musculoskeletal injuries. However, there is limited evidence that this approach is effective in reducing associated symptoms following injury. Several studies have been conducted to investigate the components of ice and compression. The majority of statements suggested a 20-minute procedure every two hours. Intermittent immersion cold therapy may also be beneficial in the first week after injury for short-term pain alleviation. Due to a lack of evidence and the risk of injury worsening as a result of vasodilation and an inflammatory reaction, thermotherapy (application of heat) is not indicated during the acute and sub acute phases of injury. There have been no Randomized controlled trials on the efficacy of rest or elevation in the treatment of acute ankle sprains. Nonetheless, an injured leg with an acute sprain can be elevated 15-25 cm above the heart to improve venous and lymphatic drainage and reduce swelling. Although there is insufficient evidence, the use of RICE therapy in the acute setting for short-term pain relief to expedite early mobilization is a reasonable, routine, and probably safe method.

ULTRASOUND – 7 MIN ONLY

Foot and ankle range of motion to improve circulation

MANUAL THERAPY (Kaltenborn Mobilization)

BALANCE TRAINING

PROPRIOCEPTION EXERCISES

HEEL RAISES

The use of manual techniques in the treatment of acute ankle sprains may help with pain management, range of motion (ROM), stride length, and functional recovery. Manual therapy's effectiveness for the primary outcome of recurrence rate, however, is debatable. Talocrural glides from anterior to posterior and talocrural distraction in the neutral posture are typical manual approaches. To relieve stiffness and swelling while enhancing range of motion (ROM) and proprioceptive awareness, soft tissue massage and manual lymphatic drainage techniques can also be used. Exercise therapy alone may not produce the same outcomes as manual therapy and exercise therapy together. A combination of posterior talar glide mobilization and active dorsiflexion is used to move the ankle joint, and it can be done in both weight-bearing and non-weight-bearing positions. This technique can be used to promote dorsiflexion even more and enhance

EXERCISE THERAPY

Comprehensive and progressive exercise treatment should comprise ROM, flexibility (stretching), resistance (strengthening), neuromuscular and proprioceptive exercises, and eventually sport-specific functional exercises. However, there is disagreement regarding the best exercise volume and content in this area.

ROM EXERCISE - Early ROM exercises should begin as soon as pain permits; however, a grade III injury may require a postponement of this programme. Grade I and II injuries are typically treatable right away. Individuals should start weight-bearing and ROM therapy as soon as the discomfort permits.

STRETCHING EXERCISE - Starting with non-weight-bearing dorsiflexion stretches and open-chain ankle motions for all planes, these exercises should advance to standing calf stretches and generalized ankle stretching in the closed chain. It is best to start extending the heel chord firmly as soon as possible. Tight heel cord is thought to function like a bowstring and increase the risk of ankle sprains.

STRENGTHENING EXERCISE - The athlete begins this phase with isometric exercises in the frontal and sagittal planes against an immovable object after regaining normal range of motion. The athlete next advances to isotonic resistive exercises for dorsiflexion, plantar flexion, inversion, and eversion as pain is tolerated utilising weights, elastic bands, or manual resistance by the therapist. It is advised to begin with isotonic activities that do not put the ligaments at risk, such as dorsiflexion and plantar flexion, in the early stages.

NEUROMUSCULAR AND PROPRIOCEPTIVE EXERCISE - In order to regain balance and postural control, the next stage of rehabilitation comprises neuromuscular and proprioceptive training. It has been shown that following an ankle sprain, neuromuscular activation patterns change, which may lead to negative effects such functional instability, aberrant gait patterns, and a higher recurrence rate. As a result, these activities may enhance functional outcome measures, lower subjective instability, and lower the likelihood of recurrence.

SPORT – SPECIFIC EXERCISE - Sport-specific training is part of the rehabilitation process' final stage. For example, plyometric training including leaping manoeuvres might be used by a basketball player, and sprinting and cutting drills might be used by a soccer player. During the initial stages of sport-specific training, the application of a brace or tape may be warranted.

Table-4 ROM post treatment

MOVEMENT (IN DEGREE)	**LEFT FOOT (NON – AFFECTED)**		**RIGHT FOOT (AFFECTED)**	
	ACTIVE	**PASSIVE**	**ACTIVE**	**PASSIVE**
PLANTER FLEXION	0-50	0-55	0-50 (PAINFULL)	0-55
DOSRI FLEXION	0-30	0-35	0-25 (PAINFULL)	0-30
ENVERSION	0-30	0-35	0-25 (PAINFULL)	0-25
INVERSION	0-30	0-55	0-55	0-55

PROLIFERATIVE PHASE :- (4-10 DAYS)

TREATMENT – Patient education: - increase activity level, Practice foot and ankle , Ankle toe movement, Active stability, Motor co – ordination, Isometric exercise, Range of motion exercise, Tape – bracing: - apply tape as soon as swelling subside.

EARLY REMODELLING :- (11-21 DAYS)

TREATMENT; education, Preventive measures (tapping – bracing)**,** advice- appropriate shoes practice foot and ankle function, balance and co –ordination, look for symmetric walk pattern Muscle strengthening exercise Proprioceptive retraining, Mobilization of ankle joint, Tapping, bracing ;A long lace – up brace is effective and comfortable.

RESULTS:

Functional scale - the foot and ankle ability measure **scale (FAAM)**, in line with this scale finding of the study are in the context of pain and functions of the patient. Score of the Functional status of the patient was 23 out of 28 points.

VAS pain scale- in line with this scale client got a score of zero out of 10 points which shows its maximum intensity after completion of rehabilitation program.

Functional exercise can be performed without pain during or after activity

Added ankle protection provided with either tapping or bracing

The goal of the rehabilitation procedure for an injured athlete is for them to return to training or competition in a timely and safe manner.

The athlete's readiness for a comeback to competition should ultimately be decided by the sports physician.

DISCUSSION-

This study was carried out to detect the add-on effect of kinesio-taping on ankle sprain following injury got during playing the basketball. Conventional exercises were also administered in this program to gain strength, stability and flexibility needed to perform sports activities at higher functional level. Study-results were found in the favor of study-assumptions. After treatment pain score (on VAS) had been changed from 9 to 0; patient was pain free after taking the full session. Functional status of the patient was improved at a higher level; foot and ankle ability measure (FAAM) score was improved highly from 0 to 23. Thus, patient achieved score of 23 out of 28 following therapeutic program. The purpose of this study was to verify whether kinesio-taping (KT) intervention with traditional exercises can help improving the pain and functional status following ankle sprain in the patient with basketball player. After KT intervention along with other exercises used in this study, the performance of the subject who participated in the ankle joint muscle strength-training program, significantly improved his pre-treatment status.

In this study kinesio-taping along with conventional exercises including Kaltenborn mobilization was applied in patient with ankle sprain after basketball injury. Substantial changes were produced between pre and post treatment. A study by **Farjad Afzal, (2022)** backed up my study by concluding that both techniques (Kaltenborn and METs) are effective in the treatment of adhesive capsulitis to decrease the pain and disability. [9] If we compare results of this published study to current study, efficacy of the Kaltenborn technique cannot be deselected. Grade-2 and grade-3 mobilization was utilized in the treatment program, in order to that pain and range along with tissue mobility was achieved.

Another study by **A. K. M. Rezwan, (2021)** favored this current study by stating that Kaltenborn mobilization techniques grade III was more effective then routine physiotherapy technique. The results of this study can be compared with study conducted by A. K. M. Rezwan, (2021). They conducted study on frozen shoulder stage of adhesive capsulitis in which they used Kaltenborn technique and they concluded that this technique is effective for control of pain, ROM and joint mobility. [10]In this study, they compared the Kaltenborn method of mobilization with conventional exercises with but in the current study Kaltenborn technique with conventional exercise was used, however grouping of exercises was different in both the studies. Pain relief was the result because Kaltenborn mobilization Grade I-II in the joint resting position has been found effective to treat the same. This also can be used to ease severe pain, spasm and parasthesia, and to help normalize join- fluid viscosities that interfere with movement. Relaxation can also be achieved through these grades. Stretching of the tight tissues can also be found with Kaltenborn mobilization Grade III in the joint resting position. Thus, increased ROM is the outcome after application of this technique with above mentioned grade.

A study by **Nan Yang, (2022)** supported this present study by emphasizing that effectiveness of kinesio-taping (KT) used in the treatment and prevention of ankle sprain in youth athletes is considerable. Kinesio taping in the form of therapeutic means has widely used in treatment and prevention of ankle sprains where hearted soft tissues are supported by this method of taping. Thus, joint functions are enhanced with proper use of KT. However, controversial statements have been found in literature regarding efficacy of KT methods. [11] even then importance of kinesio-taping cannot be ignored. Another study performed by **Jongbloed, Lisa, (2016)** evidenced this current study by suggesting that Kinesio Taping Improves Pain, Range of Motion, and Proprioception in Older Patients with Knee Osteoarthritis. Kinesio-taping facilitates the therapeutic procedure and makes it easy to perform the selected techniques during rehabilitation. Thus, kinesio-taping provide support to the executing methods through facilitations of muscular contraction easy as well as improves the stability of the joint under consideration. So, possible mechanism behind to improve range of motion is stability in terms of support and facilitation. However, the effect of KT in relation to treatment and prevention ankle sprain is still not consistent.

A study by Min-Hao Hung, (2023) supported the study by concluding that Effects of the direction of Kinesio taping on sensation and postural control before and after muscle fatigue in healthy athletes causes increased strength and stability. [12] Firstly, the substantial progress in stability found in current study in patients with ankle sprain could be the result of improved Proprioception after treatment because possibly KT has improved the afferent information resulting in enhanced measures of Proprioception. Secondly, factors like, greater confidence, self efficacy and assurance and resultant stability caused a possible change in functional status, pain and ankle-ROM of the patient with ankle sprain.

Results of this published study performed by Sun-Young Ha**, (2018);** is consistent with current study because they summarized that Proprioception causes a great change in joint movements and maintaining stability. Receptors found in muscles, tendons, ligament and capsules are the determinant of the Proprioception, which are affected by strength training programs in the course of ongoing rehabilitation.[13] Thus, neuromuscular control is developed over joints under investigation this will result in improved balance as well leading to altered ankle strategy. A study by **Amira H. Mohammed** has also similar outcomes as this current study, however with different methodology. They evaluated that substantial down grading had been fund in the context of pain and swelling following ankle sprain. This published study demonstrated that improved shoulder flexibility and strength were the facts which had been detected after cyclic stretch in volleyball players. It also came in agreement that improved flexibility, decreased joint stiffness and enhanced muscle strength were the outcomes following cyclic stretch intervention. [14]Improvements detected in the study may be assigned to the given changes occur in response to applied cyclic stretch such as Ligaments creep after implementation of load for an optimal period of time can increase the deformation of connective tissue and allow gradual adjustment of collagen fiber possible reason for these alteration may be stimulation of type II and III mechanoreceptor which restrict nociceptive transmission to spinal cord and brain in line with pain gate control theory.

LIMITATIONS-

1. Sample size; increased number of subjects can increase more understating of efficacy of treatment.
2. Interventional period of time; increased duration of time can enhance the therapeutic- effectiveness.
3. Different set of conventional exercises produces different results, thus these combination may demonstrate fluctuation of treatment-efficacy
4. Acute case; these subjects bear lesser stress during treatment so effectiveness of treatment program may be affected out of lesser impact over tissues to be treated.
5. Various type of taping also produces different therapeutic outcomes, so these shold be considered as well.

CONCLUSION:

In line with our study outcomes, add-on effect of kinesio-taping with conventional treatment programs affected positively the patient related issues generated after ankle sprain injury in terms of intensive pain, limited range of motion and instability along with restricted functions. Therefore, results of this current study can be utilized in clinical setting to resolve the issues related to ankle sprain injury.

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