

Review Article

Effect of K-Tapping on Tennis Elbow-A Systematic Review

Nezar Suliman Al Trairi¹, Shabana Khan², Sharick Shamsi^{*3}, Abdulrahman Adel Alobaidi⁴

¹Chief Physical Therapist at Prince Sultan Military Medical City, Riyadh KSA

²Physical Therapist at Prince Sultan Military Medical City, Riyadh KSA

³Consultant Physical Therapist at Tawazun Clinic for Physiotherapy and Rehabilitation, Riyadh KSA

⁴Physical Therapist at Prince Sultan Military Medical City, Riyadh KSA

*Corresponding Author Email: sharickshamsi@gmail.com

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Abstract: Introduction: Objective: This systematic review aimed to investigate the effectiveness of Kinesio Tapping (K-Tape) on patients with Tennis elbow. **Method:** Five databases (PubMed, CINAHL, Cochrane, Web of Science, Google scholar) were searched to identify eligible studies. Pooled standardized mean differences were calculated using a random effects model. The PRISMA statement was followed to increase clarity of reporting. **Results:** Five studies, including 168 patients, reporting on the subject of K-tapping and conventional physiotherapy were analyzed. These interventions showed a statistically significant effect on reducing pain, increasing gripping. **Conclusion:** K-Tapping seemed to be the most effective treatment to reduced pain and improve grip in patient with tennis elbow.

Keywords: Tennis elbow, Exercise, K-Tape.

Introduction

Tennis elbow was first used over a century ago to describe a painful condition observed in English lawn tennis players. As a group, tennis players are at a higher risk to develop lateral epicondylitis and some 40 -50% of them experience this disabling condition, at least once during their playing life time¹. Tennis elbow also known as lateral epicondyle pain is the inflammation of the extensor carpi radialis brevis tendon. Daily activity such as carrying, lifting and gripping are commonly affected by such pain. The Pain is a common health problem in the world².

Tennis elbow is traditionally considered to be self-limiting, but may last for 6-18 months. Its estimated prevalence in general population is 3-7%. Workers undertaking repetitive tasks are at greater risk, representing between 35-64% of all cases. More than 40 treatments have been proposed for tennis elbow some of which have been investigated in clinical trials and systemic reviews³. Ultrasounds (US) refer to mechanical vibrations, which are essentially the same as sound waves but of a higher frequency. US is a deep penetrating modality capable of producing changes in tissue through both thermal and non-thermal (mechanical) mechanisms. Depending on the frequency of the waves, US is used for diagnostic imaging, therapeutic tissue healing or tissue destruction. The guidelines and recent systematic reviews of therapeutic US have highlighted a need for further research to investigate the true effect of these modalities in the context of well conducted randomized controlled trials. As the application of US may have adverse effects for patients with tennis elbow (e.g. because of the transmission of thermal energy).

Various types of tapes and methods of kinesiology taping have been extensively used in physiotherapy practice. The application of kinesiology tape has an immediate effect seen which

improves the force sense in the forearm of healthy athletes. The possible mechanism of kinesiology taping (KT) is the alteration of the motor response from increased tactile input⁵.

The aim of this systematic review is to systematically assess the effectiveness of Kinesio taping on pain, disability, functional status, quality of life, and other variables on patients with Tennis elbow.

Methods

Literature Search

The literature search was restricted to English language publications from 2017 through 2020. Five databases (PubMed, CINAHL, Cochrane, Web of Science, Google scholar) were searched to identify eligible studies. Pooled standardized mean differences were calculated using a random effects model. The PRISMA statement was followed to increase clarity of reporting.

The following search terms were used to identify appropriate articles Tennis elbow, Pain, K-Tapping, Ultrasound, mobilization, manipulation, physical therapy, physiotherapy, manual therapy, and Randomized controlled trial (RCTs). A review of references listed in the articles was also performed, for additional articles that met our criteria. During searching process of all related articles, the titles and abstracts were selected according to inclusion-exclusion criteria to recognize actually suitable article. Full manuscripts of selected articles were evaluated individually by two critics.

Study Criteria

Study design

The review included RCT as they provide high quality or evidence base and published in English language.

Inclusions criteria

This systematic review will consider studies that include human participants older than 18 years affected by Tennis Elbow.

Intervention

This review considers studies that evaluate K-tapping performed on patients with Tennis elbow. The intervention group (K-Tapping) will be compared to a control group where another or no type of intervention has been performed.

Quality assessment

Quality of methodology of carefully chosen manuscripts was evaluated by PEDro Scale, containing of 11 questions in two phases. Questions from 1–9 evaluates internal validity while questions from 10–11 evaluates statistical evidences necessary to make a research readable. Each question is scored according to its presence or absence in the evaluated manuscript. The final score is completed by adding all positive responses.

Moseley et al. stated that studies having score more than or equal to 5 out of 10 were measured as high quality research. Thus, in this research all included articles scored more than or equal to 5, were found to have high quality in methodology. The articles were evaluated in PEDro scale by two reviewers' independently⁶.

Data analysis

The selected articles were screened by two reviewers independently. They were evaluated in a structured way, consisting of given parameters: author, year, study-design, subject's age, interventions, study-duration, outcome measures, and results. Dissimilarities between the reviewers were resolved by discussions to reach settlement and established via Cohen's kappa statistics.

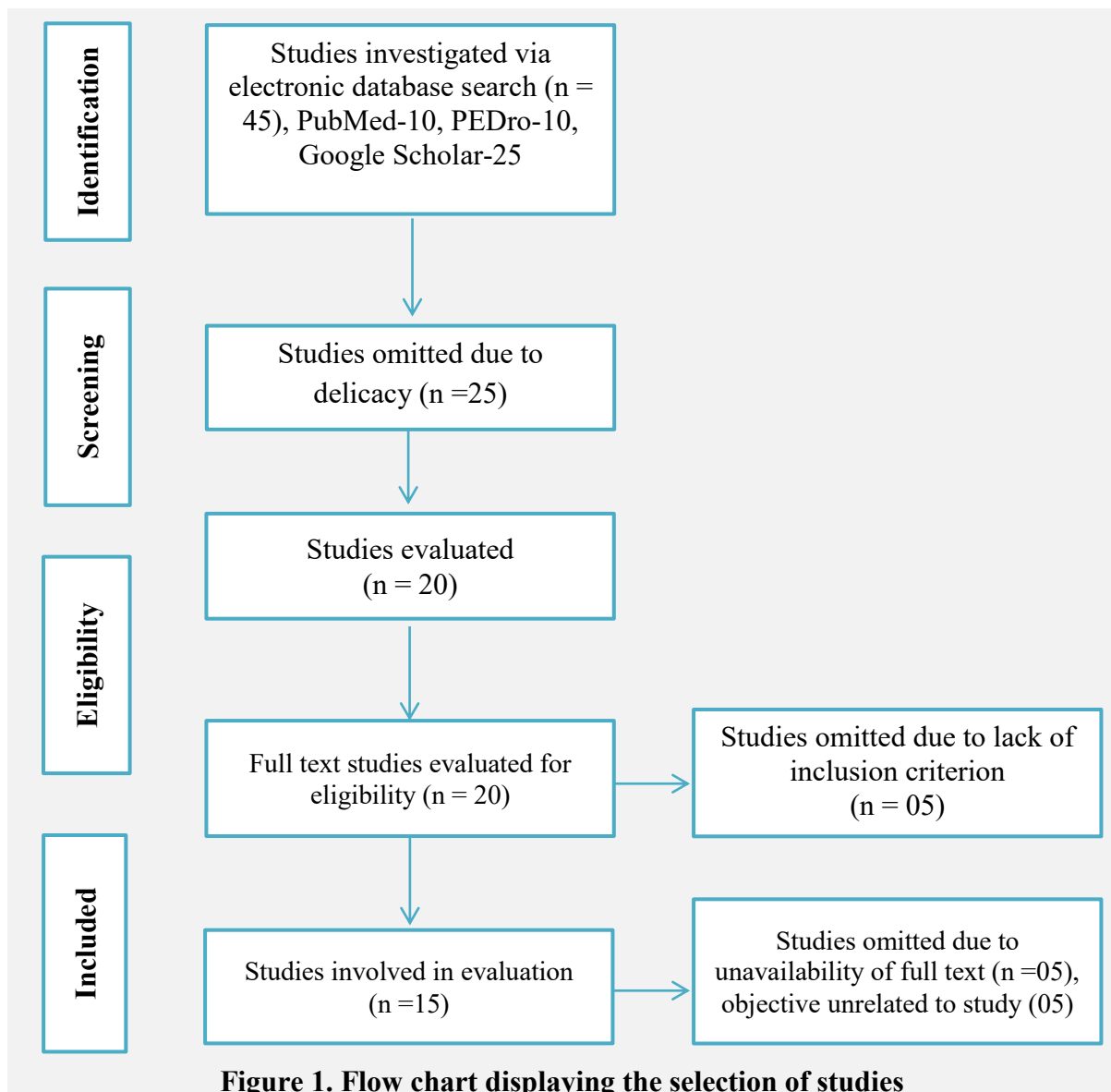
Outcome Measures

The main outcome measures are Pain-pressure algometer, Hand-held dynamometer, kilogram (Kg) and Visual Analogue Scale (VAS).

Results

Studies identified

After applying the inclusion criteria, 45 studies were selected, 25 studies were disqualified as they were found in more than one databank. For eligibility criteria 20 studies were selected. Additionally, 15 articles were omitted due to unavailability of full manuscript and objective, unable to meet inclusion (Figure-1). 05 articles were selected finally, after passing quality evaluation phase.



General data of the included studies

Selected articles in this review are summarized in **Table 1** including given parameters: author-year, study design, subjects, interventions, study duration, outcome measures, and results. All 5 studies included in this study were RCTs^{7,8,9,10,11}. All studies were conducted between 2017 and 2020. Number of participants in the studies ranged from 20 to 48.

All articles were experimental. Concerning the efficacy of results established in the most of the articles, K-Tapping was found to be significantly effective on Tennis elbow between pre-and post-intervention assessments.

Table 1. Description of the included studies

Author	Study design	Subject	Intervention	Study Duration	Outcome measure	Result
Gracias A, Shobha-lakshmi S ⁷ .	Randomized controlled trial	N=30	Group 1: Sham taping group Group 2: Therapeutic taping group	One Time Study	Pain-pressure algometer, Hand-held dynamometer	The findings of the study indicates that, there is a significant improvement in pain pressure threshold and grip strength after the immediate application of KT in the experimental group as compared to the control group.
Shaheen H, et al ⁸ .	Randomized controlled trial	N=20	Group 1: Ultrasound and exercises Group 2: Kinesio tape and exercises group	4 weeks	Hand-held dynamometer, kilogram (Kg) and Visual Analogue Scale (VAS).	The treatment was improvement between both groups. However, the kinesio tape is better than therapeutic ultrasound.
Shakeri H, et al ⁹ .	Randomized controlled trial	N=30	Group 1: KT with tension Group 2: placebo (KT without tension).	One week 3 times	Visual Analogue Scale (VAS), algometer	The application of KT produces an improvement in pain intensity and upper extremity disability in subjects with LE and MTP in fore arm muscles, and KT with tension was more effective than placebo group.
Fouda KZ, Dewir IM ¹⁰ .	Randomized controlled trial	N=40	Group 1: Supervised exercise program plus “Y pattern technique” KT Group 2: Supervised exercise program plus “diamond taping technique”.	4 weeks	Visual Analogue Scale (VAS).	Athletic tape was equally effective to the KT in gaining long term benefits in LE. Both taping techniques used in the present study were equally effective in pain reduction and improving hand grip strength in patients with LE.
Tezel N, et al ¹¹ .	Randomized controlled trial	N=48	Group 1: KT group Group 2: Sham group	One week	Visual Analog Scale (VAS), hand dynamometer	Both KT and sham taping provided similar improvement in pain relief through arm functions in patients with chronic LE.

Table 2. Risk of Bias of Included Studies (Yes, Low Risk of Bias; No, High Risk of Bias)

Citations	Adequate Sequence Generation?	Allocation Concealment?	Blinding?	Incomplete Outcome Data Addressed?	Free of Selective Reporting?	Conclusions
Gracias A, Shobhalakshmi S ⁷ .	Yes	Yes	Yes	Yes	Yes	Low risk of bias
Shaheen H, et al ⁸ .	Yes	Yes	Yes	Yes	Yes	Low risk of bias
Shakeri H, et al ⁹ .	No	No	No	Yes	Yes	High risk of bias
Fouda KZ, Dewir IM ¹⁰ .	Yes	Yes	Yes	Yes	Yes	Low risk of bias
Tezel N, et al ¹¹ .	No	No	No	Yes	Yes	High risk of bias

Discussion

This systematic review was done to analyze the effects of K-Tapping in Tennis Elbow patients. All included studies showed positive effects on the pain. Evidences from RCTs were used to examine the effectiveness of K-Tapping on Tennis elbow. A total of five research articles on K-Tapping for Tennis elbow patients are included in this review. The articles that studied grip strength and forearm extensor strength indicated contradictory results. A group of writers found out that Kinesio tape increases grip strength¹². There is also another hypothesis which states that Kinesio tape is effective in treatment of patients having lateral epicondylitis by decreasing muscles weariness and maintaining their strength¹³. Another study suggested that there are contradictory results in grip strength while using brace in individuals with and without pathology. Using brace in people with lateral epicondylitis increases grip strength, unloading muscle decreases the pain and the person will have stronger contradiction¹⁴. The articles which studied functional activity all concluded that the Kinesio tape improves the functional activity. This can be attributed to therapeutic effect of Kinesio tape in decrease of pain and improvement of muscle contraction. There is also psychological effect like easiness which can be felt while using Kinesio tape continuously, this is one of the prominent effects of this method which is not observed in other therapeutic interventions¹⁵.

Conclusion

In short, the research included in the present study indicate beneficial effects of K-Tapping technique in the gain of range of motion, Gripping, improvement of Pain in tennis elbow patients.

Declarations

Acknowledgments: Not applicable.

Conflict of Interest: No potential conflict of interest was reported by the authors.

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Ethical Approval: Not required.

Informed Consent: Not required.

Author Contributions: All Authors contributed equally in collecting data, writing manuscript, proof reading as well as formatting.

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