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Efficacy of Kinesio Tape in Treatment of Temporomandibular Disorders - A Systematic Review

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ABSTRACT:

AIM: To assess the effectiveness of Kinesio tape for Temporomandibular disorders.

MATERIALS AND METHODS: The studies that are included in this systematic review are randomised controlled trials that are directly associated with testing the efficacy of Kinesio taping in the management of Temporomandibular disorder. For this systematic review, seven bases (Central, PubMed, Science Direct, Cochrane Register of Controlled Trials (CENTRAL), Scopus, Lilacs and Grey literature) were taken into study for review from October to November 2020. A literature search to gather pertinent data was performed using MeSH terms "Efficacy of Kinesio tape in treating Temporomandibular disorders". Nine articles were screened after duplication four articles did encounter the inclusion and exclusion criteria. The experiments and the results of these articles were read and analysed.

RESULTS:All four articles did recognize and aided the certitude that the Kinesio tape application helped in improving the results of Temporomandibular disorders in relieving pain and also improving the results of the treatment.

CONCLUSION: This systematic review gives testimony that the Kinesio tape in point of fact is effective in management of pain in Temporomandibular joint disorder.

KEYWORDS: Kinesio taping, Temporomandibular disorder, Pain management, myofascial syndrome, Analgesic effects.

INTRODUCTION:

The temporomandibular joint (TMJ) is vitalized by branches of the trigeminal nerve. Neural inflammation in the peripheral nervous system (PNS) causes Temporomandibular disorders (TMD) at the site of bruise or injury compression, and it may also cause effects on the central nervous system (CNS) as a systemic effect. Raise, or elevation of cytokines and microglia activation, is expressed as Neural-inflammation. Treating the site of injury or compression will cause a reduction in the neural-inflammation. fMRI brain activities are used to measure these changes of inflammation [1].

Temporomandibular disorder is the most common disorder occurring in the oral cavity in people. The temporomandibular joint articulates the jaw to the temporal bones of the skull; this helps in the functioning of the jaw like mastication, speech and yawn. Any problem with the jaw, muscles or both that controls the temporomandibular joint is called Temporomandibular disorder. Causes of temporomandibular disorders are Bruxism, Arthritis, Trismus, Injury to the jaw or heavy blow or whiplash injury. Temporomandibular disorder can have various symptoms such as pain, clicking sounds, limited or excess mouth opening [2].

Temporomandibular disorders are the second frequent musculoskeletal pain. It is said that almost 33% of the population have experienced a minimum

of 1 temporomandibular sign and symptom, whereas 3.6 to 7.0% of the population have the temporomandibular disorder with critical symptoms and signs [3]. Predilection in middle-aged females [4].

Recently, patients number visiting the dental clinic with copious symptoms are multiplying in numbers. Nevertheless, differential diagnosis and genuine treatment of Temporomandibular are not that easy as the nature of the disease is convoluted and assorted with various symptoms and signs of profuse maxillofacial diseases. Due to this difficulty, although the correlation between the patient's symptoms affirmation is not evident, occasionally, certain symptoms are indistinguishable with Temporomandibular disorder, which requires attention as long as they are salient and significant complications to the patients [5].

Other chronic pain conditions share an analogy with Temporomandibular disorder − such as chronic tension-type fibromyalgia, migraine or headache and low back pain [6].

Temporomandibular disorders can affect the individual's quality of life, so diagnosing and treating this condition is necessary [4].

To diagnose Temporomandibular disorder, a prerequisite is of at least more than one symptom among the following ones: 1) Tenderness of Temporomandibular joint or masticatory muscle or both 2) Sounds of TMJ, and 3) Trismus or jaw movement dysfunction. The most common symptom is tenderness, but still, there are even some other symptoms like the restriction of mandible movement and sounds of the Temporomandibular joint {clicking, popping, crepitus} [5].

Diagnosis in temporomandibular disorder was of two main criteria Arthrogenousand Myogenous

Commonly used criteria are the dual-axis diagnostic system for temporomandibular disorders research diagnostic criteria for temporomandibular disorders by Dworkin and Le Resche [4]. There are certain treatment planning for temporomandibular having surgical and non-surgical methods [4]. The focus of treatment is to reinstate the function. The Kinesio Taping technique was initially found by Dr KenzoKase (is a Japanese Chiropractor in 1970s). Kinesio Tape is tensile 40% to 60% resting length, latex-free, and it is as thin as that of the epidermis of the skin, which avoids sensory stimuli and the perception of its weight. Tape is made of elastic polymer strand muffled by 100% cotton thread which helps dry the moisture present in our skin [4].

Although the definite mechanism cannot be acknowledged, proprioceptive feedback mechanisms, sensorimotor, excitatory and, inhibitory and nociceptive stimuli, mechanical restraint were described as fundamental mechanisms [7].

According to the American College of Rheumatology instruction, among other pertinent nonpharmacological treatment techniques for individuals with Kinesio taping, elastic taping is a beneficial remedial tool able to furnish pain relief [8]. Furthermore, Kinesio Tape is a simple and productive treatment for musculoskeletal diseases that have recently been intervened [9].

Taping, in general, has been used for both the treatment and fend off for sports injuries, sometimes in fracture to provide protection and aid to the joint or muscle during motion [10].

Kinesio tape has been extensively used in a span of painful disorders which incorporate musculoskeletal diseases, and it is also used in postoperative care and treatment in maxillofacial surgery [4]. This technique is taping the soft tissue attached to the skin according to the anatomy of the joints and muscles to enhance the function [11]. This study aims to assess the effectiveness of Kinesio tape for Temporomandibular disorders.

MATERIALS AND METHODS:

STUDY DESIGN:

Systematic review of randomized controlled trials.

ELIGIBILITY CRITERIA:

INCLUSION CRITERIA:

1. Randomized controlled trials from 2010 to 2020.
2. Full-text article available in search engine mentioned in the search strategy were included.
3. Studies in which Kinesio tape was used as one of the interventions for Temporomandibular disorders.

EXCLUSION CRITERIA:

1. Non-randomized studies.
2. Studies in which Kinesio tape was used for other purposes than Temporomandibular disorders.

SEARCH STRATEGY:

Published literature on assessing the effectiveness of Kinesio tape in treatment of Temporomandibular disorders, which incorporates research papers and original articles in databases such as Central, PubMed, Science Direct, Cochrane Register of Contolled Trials (CENTRAL), Scopus, Lilacs and Grey literature were taken into study for review from October to November 2020. A literature search to gather pertinent data was performed using MeSH terms “Efficacy of Kinesio tape in treatment of Temporomandibular disorders”.

Table 2: Characteristics of interventions in the study

AUTHOR NAME	YEAR	SAMPLE SIZE	DURATION	PATIENT CHARACTERISTICS	INTERVENTIONS
Fei He et al.	2020	60	6 Days	Male and female patients of 18 to 55years with temporomandibular disorder.	Group1: Control group-20 {males=20, females=11} Group2: Short wave group-20 {males=11, females=9} Group3: Taping group-20 {males=8, females=12}
IlkeCoskunBenlidayi et al.	2016	33	6 Months	Patients below 55years of age with myofascial and joint pain and/or disc displacement with reduction diagnosed by a dentist.	Group1: Control group-16 Group2: Experimental group-17
YoungsookBae.	2014	42	2 Weeks	Male and female patients of 20 to 30years with latent Myofascial trigger points in the SCM muscle.	Group1: Control group-19 {male=8, females=11} Group2: Experimental group-28 {males=9, females= 14}
DanutaLietz-Kijak et al	2018	60	5 Days	Male and Female patients of 18 to 35years with painful functional disorders within the masticatory muscles of myofascial characteristic	Group1: Group KT-30 {males=5, females=25} Group2: Group TrP-30 {males14, females=16}

Table 3: Characteristics of outcome and effect measure

AUTHOR NAME	YEAR	EFFECT MEASURE	RESULTS	OUTCOME
Fei He.	2020	Self-Rating Anxiety Scale (SAS), Craniomandibular index (CMI), and Self- Rating Depression Scale (SDS)	CMI was significantly improved compared to the control group ($P < 0.05$). The SAS improved significantly compared to the control and short-wave groups ($P < 0.05$). The SDS in the short-wave group improved significantly compared to the control and taping groups ($P < 0.05$).	Kinesio Tape effectively improved the dysfunction and mood of TMD patients with group I disorders.
IlkeCoskunBenlidayi et al.	2016	Visual analogue scale (VAS) scores and self-reported measures.	Pain, depression and disability scores reduced significantly in the experimental group ($p = 0.001$, $p = 0.006$ and $p = 0.01$, respectively), but not in controls.	Kinesio Tape in combination with counselling and exercise is more effective than counselling and exercise alone in TMDs.
YoungsookBae et al.	2014	visual analogue scale (VAS), pressure pain threshold (PPT) and the range of motion of the temporomandibular joint.	The ROM of the TMJ increases significantly ($p<0.05$). VAS score and PPT decreased significantly ($p<0.01$ and $p<0.05$, respectively)	Kinesio taping is an intervention method that can be applied to latent myofascial trigger points. The results of Kinesio taping were effective on pain triggered in latent MTrPs as a result from immoderate stress on the SCM muscle and that as excessive stress on the SCM muscle decreased.
DanutaLietz-Kijak et al	2018	visual analogue scale (VAS).	significant therapeutic analgesic effects in the course of pain-related functional disorders of the muscles of mastication.	More beneficial outcomes of the therapy were observed after using the Kinesio Tape method, which increased the analgesic effect in dysfunctional patients.

Figure 4: Bias assessment as included in the studies

AUTHOR NAME & YEAR	RANDOM SEQUENCE GENERATION	ALLOCATION CONCEALMENT	BLINDING OF OUTCOME	INCOMPLETE OUTCOME DATE	BLINDING OF PARTICIPANTS AND PERSONNEL	JUDGEMENTAL BIAS
Fei He. 2020	-	-	-	-	+	-
IlkeCoskunBenlidayi et al.						

2016	-	-	-	-	+	-
YoungsookBae et al. 2014	-	-	-	-	+	?
DanutaLietz-Kijak et al. 2018	-	-	-	-	+	?

- : INDICATES LOW RISK BIAS
+ : INDICATES HIGH RISK BIAS
? : INDICATES UNKNOWN

DISCUSSION:

Face and oral pain syndromes enduring longer than six months are associated issues. Neurologists, Laryngologists, Physiotherapists, Psychiatrists, and Dentists share close cooperation in identifying the affliction's source and circumventing the misdiagnosis or erroneous causal relationship. The reckon source of the discomfort or pain and accompanying symptoms is known and helped diagnose and manage the disease. It is a salient feature to remember that the chronic conditions, including pain, affects both the social status and psychological effects on patients, which again brings down the quality of life [12].

After scrutinizing the above studies on the usage of the Kinesio tape in Temporomandibular disorder, the usage of the Kinesio tape is advised as a short-term action in addition to other exercise and pharmacological strategies for reducing the pain. Therefore, Kinesio tape is delineated as a substitute or complementary treatment for the Temporomandibular disorder and not the suitable or the only treatment. It is proposed as a consortium with other assets and techniques [13].

Fei He et al, during 2020 for 60days conducted a RCT with 60 samples of Male and female patients of 18 to 55years with temporomandibular disorder randomly divided into Group1: Control group-20 {males=20, females=11}, Group2: Short wave group-20 {males=11, females=9}, Group3: Taping group-20{males=8, females=12}. The 60 Temporomandibular disorder patients were managed with dissimilar rehabilitation intervention methods as claimed by their grouping. The control group was furnished with regular regime health education only; the short-wave group was managed with short wave treatment and regular regime health education. Although, the taping group experienced the Kinesio Tape treatment on the premise of regular regime health education. The assessment of the results included the Friction craniomandibular index (CMI), Self-Rating Anxiety Scale (SAS), and Self-Rating Depression Scale (SDS). By comparing the assessing results, the consequence of Kinesio Tape on Temporomandibular disorder treatment was investigated furthermost. CMI was significantly improved compared to the control group ($P < 0.05$), the SAS improved significantly compared to the control and short-wave groups ($P < 0.05$), the SDS in the short-wave group ameliorated significantly compared to the control and taping groups ($P < 0.05$). The upshot stipulated that the Kinesio Taping effectively improved the dysfunction and mood of TMD patients with group I disorders [11].

IlkeCoskunBenlidayi et al., during 2016 for 6months, conducted an RCT with 33 samples of patients below 55years of age with myofascial and joint pain and disc displacement with reduction diagnosed by a dentist were randomly divided into Group1: Control group-16, Group2: Experimental group-17. Both the groups were instructed in lifestyle counselling and guided with jaw exercises. The experimental groups, in addition to exercise Kinesio Taping, was. Exercises were replicated about eight times per session, three times a day for six weeks. Kinesio Taping was applied to the experimental group 2 times by a certified physician (ICB, first author). Each application endured for about three days. Taping technique followed by Kenzo et al. description. “Y” shaped Kinesio strip was prepared to express the measurements for each discrete. The assessment of the results includes Visual analogue scale (VAS) scores and self-reported measures. Pain, depression and disability scores reduced significantly in the experimental group ($p = 0.001$, $p = 0.006$ and $p = 0.01$, respectively), but not in controls. The upshot stipulated Kinesio taping is thought to be an intervention method that can be applied to latent myofascial trigger points, and Kinesio taping was effective on pain triggered in latent MTrPs as a result of immoderate stress on the SCM muscle and that as excessive stress on the SCM muscle decreased [14].

YoungsookBae, during 2014 for two weeks conducted an RCT with 42 samples of Male and female patients of 20 to 30years with latent Myofascial trigger points in the SCM muscle were randomly divided into Group1: Control group-19 {male=8, females=11}, Group2: Experimental group-28 {males=9, females= 14}. The subjects were selected by experienced physical therapists subjected to latent MTrPs in the SCM muscle. To inspect latent MTrPs in the SCM muscle, the subjects lay on a treatment table in a supine position and their head in the direction opposite to the view of the affected SCM muscle. The trigger point detection criteria are palpable or visible local twitch on snapping palpation, hypersensitive spots present in the taut bands, referred pain triggered when a sensitive spot was palpated and palpable taut bands present in the skeletal muscles. The experimental group received Kinesio taping. In comparison, the control group did not receive Kinesio taping. The assessment of the results includes visual analogue scale (VAS), pressure pain threshold (PPT) and the range of motion of the temporomandibular joint. VAS score and PPT decreased significantly ($p<0.01$ and $p<0.05$, respectively). The ROM of the TMJ increases significantly ($p<0.05$). The upshot stipulated Kinesio taping is thought to be an intervention

method that can be applied to latent myofascial trigger points, and Kinesio taping was effective on pain triggered in latent MTrPs as a result of excessive stress on the SCM muscle and that as excessive stress on the SCM muscle decreased [14].

DanutaLietz-Kijak et al., during 2018 for five days conducted an RCT with 60 samples of Male and Female patients of 18 to 35years with painful functional disorders within the masticatory muscles of myofascial characteristic were randomly divided into Group1: Group KT-30 {males=5, females=25}, Group2: Group TrP-30 {males14, females=16}. Group KT was subjected to active Kinesio Taping application (K- Active Tape Classic, 50 mm × 17 m. Subjects undergoing therapy were diagnosed with an immoderate tension of masseter muscles and muscular pain, without restrictions in the movements of the mandible and disc derangement and joint pain period of 5 days. They were advised to carry out everyday activities without unnecessary care. Group TrP was subjected to physiotherapy with the release of trigger points by the ischemic compression method. The assessment of the results by visual analogue scale (VAS). Significant therapeutic analgesic effects in the course of pain-related functional disorders of the muscles of mastication. The upshot stipulated more beneficial outcomes of the therapy were observed after using the KT method, which increased the analgesic effect in dysfunctional patients [12].

CONCLUSION:

Kinesio Tape is an effective intervention in Temporomandibular disorder as it improves dysfunction and mood when combined with counselling and exercise.

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