

# Use of kinesiology tape for pain relief in the treatment of temporomandibular disorders: a systematic review with meta-analysis

## O uso da bandagem elástica adesiva para alívio da dor no tratamento das disfunções temporomandibulares: revisão sistemática com metanálise

Tatyana Meneses Emérito<sup>1</sup> , Júlia Ana Soares Silva<sup>2</sup> , Renata Maria Moreira Moraes Furlan<sup>3</sup> 

### ABSTRACT

**Purpose:** To verify the effects on pain relief by applying kinesiology tape on the masticatory muscles, in comparison with other interventions, in people with temporomandibular disorders. **Research strategy:** Search in LILACS, IBECs, CINAHL, Scopus, Web of Science, Cochrane, EMBASE, and MEDLINE. The research question, based on the PICOT components, was: “Does kinesiology tape applied on to masticatory muscles relieve the pain in people with temporomandibular disorders?”. **Selection criteria:** The included articles were clinical trials using kinesiology tape on masticatory muscles in people with temporomandibular disorders, published in Portuguese, English, or Spanish. Articles whose authors had not adopted this application method and pain intensity as an outcome were excluded. Eligibility was assessed by reading their titles, abstracts, and full texts. The following information was extracted: year of publication, the country where the study was conducted, age and clinical condition of the sample, treatment, and pain assessment results. The meta-analysis, using the inverse variance method, considered the mean value indicated in the visual analog scale as the intervention effect measure. **Results:** Initially, 344 references were retrieved, of which three were selected. Significantly better pain relief results were identified after 1 week of using the tape, in comparison with the other conservative approaches analyzed. **Conclusion:** Considering the included articles, the kinesiology tape had significant results with greater pain relief in the first week. However, small number of studies and their biases limit the findings.

**Keywords:** Athletic tape; Masticatory muscles; Temporomandibular joint disorders; Facial pain; Speech, Language and Hearing Sciences

### RESUMO

**Objetivos:** Verificar o efeito da aplicação da bandagem elástica sobre músculos mastigatórios no alívio da dor, em comparação com outras intervenções, em indivíduos com disfunções temporomandibulares. **Estratégia de pesquisa:** Busca nas bases de dados LILACS, IBECs, CINAHL, Scopus, Web of Science, Cochrane, Embase e MEDLINE. A pergunta norteadora, utilizando-se os elementos da estratégia PICOT (população, intervenção, comparador, *outcome*/desfecho, tipo de estudo) foi: “A bandagem elástica promove alívio da dor em indivíduos com disfunção temporomandibular?”. **Crítérios de seleção:** Foram incluídos ensaios clínicos que fizeram uso da bandagem elástica em músculos mastigatórios de indivíduos com disfunção temporomandibular, publicados em português, inglês ou espanhol. Foram excluídos os artigos que não abordavam o método de aplicação e o desfecho “intensidade da dor”. A avaliação da elegibilidade foi realizada pela leitura dos títulos e resumos, bem como pela leitura dos estudos na íntegra. Foram extraídas informações sobre ano de publicação, país de condução do estudo, idade e condição clínica da amostra, tratamento e resultados da avaliação da dor. Na metanálise, realizada por meio do método do inverso da variância, a média do valor indicado na escala visual analógica foi considerada como medida de efeito da intervenção. **Resultados:** Foram localizadas, inicialmente, 344 referências, das quais, 3 foram selecionadas. Foram identificados resultados significativamente superiores na redução da dor, em uma semana de uso da bandagem, na comparação com outras abordagens conservadoras analisadas. **Conclusão:** Considerando os artigos incluídos, a bandagem elástica apresentou resultados significativos para maior redução da dor na primeira semana. Porém, o número reduzido de estudos e a presença de vieses limitam os achados.

**Palavras-chave:** Fita atléctica; Músculos da mastigação; Transtornos da articulação temporomandibular; Dor facial; Fonoaudiologia

Study carried out at Universidade Federal de Minas Gerais – UFMG – Belo Horizonte (MG), Brasil.

<sup>1</sup>Curso de graduação em Fonoaudiologia, Centro Universitário Uninovafapi – Teresina (PI), Brasil.

<sup>2</sup>Curso de graduação em Fonoaudiologia, Faculdade de Medicina, Universidade Federal de Minas Gerais – UFMG – Belo Horizonte (MG), Brasil.

<sup>3</sup>Departamento de Fonoaudiologia, Faculdade de Medicina, Universidade Federal de Minas Gerais – UFMG – Belo Horizonte (MG), Brasil.

**Conflict of interests:** No.

**Authors' contribution:** TME and JASS were responsible for designing the research project; selection, collection and analysis of data; and writing the manuscript; RMMMF supervised and performed the critical review of the article.

**Funding:** Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), process nº 137209/2021-5.

**Corresponding author:** Renata Maria Moreira Moraes Furlan. E-mail: [renatamfurlan@gmail.com](mailto:renatamfurlan@gmail.com)

Received: January 25, 2022; Accepted: March 16, 2022

## INTRODUCTION

Temporomandibular disorder (TMD) is the most frequent cause of non-dental chronic orofacial pain<sup>(1)</sup>, with an estimated 31% prevalence in adults and older people and 11% in children and adolescents<sup>(2)</sup>. Although it may occur at any age, it is more common in 20-to-40-year-old people<sup>(2)</sup>.

TMD is a set of disorders involving the masticatory muscles, temporomandibular joint (TMJ), and/or associated structures<sup>(3)</sup>. It is classified into myogenous and arthrogenous TMD and may or may not be associated with headaches. Myogenous TMD encompasses myalgia, which in turn is divided into three types: local myalgia, myofascial pain with spreading, and reported myofascial pain. As for arthrogenous TMD, there are six types: disk displacement with reduction; disk displacement with reduction and intermittent locking; disk displacement without reduction, without limited opening; disk displacement without reduction, with limited opening; degenerative joint disease; and subluxation<sup>(4)</sup>. Each diagnosis has specific classification criteria; the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) is a reliable and widely used instrument to classify TMD<sup>(4)</sup>.

The etiology of TMD is multifactorial. Causal factors include malocclusion, traumas, systemic diseases, deleterious oral habits, postural changes, stress, and anxiety<sup>(5)</sup>. Symptoms include facial pain, TMJ pain and/or masticatory muscle pain, headache, earache, sensitivity to palpation of the TMJ musculature, joint noises, and difficulties masticating. Pain and limited mandibular movement amplitude are among the most prevalent symptoms<sup>(6,7)</sup>.

Various therapeutic approaches are employed in TMD treatment, which depends mainly on the type and clinical characteristics of the disorder. The kinesiology tape is a conservative therapeutic resource that can be used in the rehabilitation of musculoskeletal disorders. It increases body stability, joint protection, segment correction and alignment, biomechanical movement changes, and proprioception training<sup>(8)</sup>. This tape is made with elastic polymers enclosed in cotton fibers, which allows sweat evaporation; its characteristic width resembles that of the skin, it can be stretched lengthwise from its initial size, and it adheres to the skin for several days<sup>(8)</sup>.

Authors report the benefits of using kinesiology tape on the masseter muscle in combination with traditional speech-language-hearing therapy in a clinical case; they ascribed the pain relief within a few sessions to the effect of this therapeutic resource<sup>(9)</sup>. Pain relief<sup>(10-12)</sup> and muscle relaxation<sup>(13)</sup> benefits have also been reported regarding other muscle groups (e.g., the cervical ones). Kinesiology tape use in speech-language-hearing clinical practice has been increasing, and so has the scientific research on the topic – although such literature is still scarce. Therefore, it is important to verify the effectiveness of this resource on orofacial pain as a complementary technique to various other treatments and modalities in clinical practice, in the acute and chronic phases of rehabilitation, and as a preventive measure.

## PURPOSE

To verify the effects on pain relief by applying kinesiology tape on the masticatory muscles, in comparison with other interventions, in people with temporomandibular disorders.

## RESEARCH STRATEGY

A systematic review with meta-analysis was developed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)<sup>(14)</sup>. The research was registered in the International Prospective Register of Systematic Reviews (PROSPERO), under number CRD42021255214.

The research question was developed with the PICOT components – P (population) referred to subjects with TMD, regardless of type; I (intervention), the kinesiology tape; C (comparator), other conservative interventions in TMD treatment; O (outcome), pain intensity; and T (type of study), clinical trials. Thus, the research question was defined as follows: “Does kinesiology tape applied onto masticatory muscles relieve the pain in people with TMD?”.

The national and international literature, published in English, Portuguese, or Spanish, was surveyed in LILACS (Latin American and Caribbean Health Sciences Literature) and IBECs (Spanish Bibliographic Index of the Health Sciences) (via Virtual Health Library - VHL), CINAHL (Cumulative Index to Nursing and Allied Health Literature), Scopus, Web of Science, Cochrane, EMBASE, and MEDLINE (via PubMed). The survey was conducted in March 2021 and updated in February 2022. The bibliographical references in the selected articles were manually searched. Specific descriptors and free terms were used for each database. The descriptors were selected from the Health Sciences Descriptors/Medical Subject Headings (DeCS/MeSH) and EMBASE Subject Headings (Emtree). The free terms were obtained from keywords in articles on the topic, based on a pilot search. The search strategies combined the research population and intervention. The descriptors, free terms, and search strategies used in the research are shown in Chart 1.

## SELECTION CRITERIA

The inclusion criteria were as follows: original clinical trial research using kinesiology tape on the masticatory muscles in people with TMD, published in English, Spanish, or Portuguese, with no restriction on the year of publication. Articles that did not approach the application method, assess pain intensity as an outcome, or compare the outcome with a group submitted to another type of intervention were excluded from the sample.

Two researchers independently selected the articles in stages, and the data were managed in Microsoft Excel. In the first stage, duplicate references were eliminated. In the second one, the abstracts were read, and the articles that did not meet the inclusion criteria, according to each researcher’s “yes” or “no” answers, were excluded. The articles that received a “yes” from both researchers were included to be read in full text, while those that obtained a “no” from both researchers were excluded. In case of disagreement between them, a consensus meeting was held; if they still disagreed, a third rater was consulted.

**Chart 1.** Search strategies used for each database

Databases	Search strategy
VHL	("Athletic Tape" OR "Kinesio Tape" OR "Kinesio Tapes" OR Kinesiotape OR "Orthotic Tape" OR "Knesio taping" OR "Compression bandages" OR "Adhesive elastic bandages") [Palavras] and ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Temporomandibular Joint Dysfunction Syndrome" OR "Myofascial Pain Syndromes" OR "Temporomandibular Joint Disc" OR "Masticatory Muscles") [Palavras]
PubMed	("Athletic Tape" OR "Kinesio Tape" OR "Kinesio Tapes" OR Kinesiotape OR "Orthotic Tape" OR "Knesio taping" OR "Compression bandages" OR "Adhesive elastic bandages") AND ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Temporomandibular Joint Dysfunction Syndrome" OR "Myofascial Pain Syndromes" OR "Temporomandibular Joint Disc" OR "Masticatory Muscles")
CINAHL	("Athletic Tape" OR "Kinesio Tape" OR "Kinesio Tapes" OR Kinesiotape OR "Orthotic Tape" OR "Knesio taping" OR "Compression bandages" OR "Adhesive elastic bandages") AND ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Temporomandibular Joint Dysfunction Syndrome" OR "Myofascial Pain Syndromes" OR "Temporomandibular Joint Disc" OR "Masticatory Muscles")
Web of Science	ALL=("Athletic Tape" OR "Kinesio Tape" OR "Kinesio Tapes" OR Kinesiotape OR "Orthotic Tape" OR "Knesio taping" OR "Compression bandages" OR "Adhesive elastic bandages") AND ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Temporomandibular Joint Dysfunction Syndrome" OR "Myofascial Pain Syndromes" OR "Temporomandibular Joint Disc" OR "Masticatory Muscles")
Scopus	(ALL("Athletic Tape") OR ALL ("Kinesio Tape") OR ALL ("Kinesio Tapes") OR ALL (Kinesiotape) OR ALL ("Orthotic Tape") OR ALL ("Knesio taping") OR ALL ("Compression bandages") OR ALL ("Adhesive elastic bandages")) AND (ALL ("Temporomandibular Joint") OR ALL ("Temporomandibular Joint Disorders") OR ALL ("Temporomandibular Joint Dysfunction Syndrome") OR ALL ("Myofascial Pain Syndromes") OR ALL ("Temporomandibular Joint Disc") OR ALL ("Masticatory Muscles"))
EMBASE	("Athletic Tape" OR "Kinesio Tape" OR Kinesiotape OR "Compression bandage") AND ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Myofascial Pain" OR "Temporomandibular Joint Disc" OR "Masticatory Muscle")
Cochrane	("Athletic Tape" OR "Kinesio Tape" OR "Kinesio Tapes" OR Kinesiotape OR "Orthotic Tape" OR "Knesio taping" OR "Compression bandages" OR "Adhesive elastic bandages") AND ("Temporomandibular Joint" OR "Temporomandibular Joint Disorders" OR "Temporomandibular Joint Dysfunction Syndrome" OR "Myofascial Pain Syndromes" OR "Temporomandibular Joint Disc" OR "Masticatory Muscles")

In the third selection stage, the articles potentially relevant to the review were likewise analyzed by two researchers in full-text, applying the eligibility criteria. They again gave a "yes" or "no" to each article. Those that received a "yes" from both raters were included in the research, while those that obtained a "no" from both were excluded. Similarly, if they disagreed, a consensus meeting was held; if they still disagreed, a third rater was consulted.

## DATA ANALYSIS

The following data were collected from the selected articles in a protocol developed for the research: author, year of publication, the country where the study was conducted, sample characteristics (sex, age, clinical condition, and treatment received), application objective, collection method (number of applications, time of tape use, time of treatment, place of application, technique employed), results obtained regarding pain intensity, and conclusion. The data were independently extracted by two researchers, who met afterward to check the results.

The Q test and  $I^2$  index were used to assess the heterogeneity between the studies. The intervention effect size considered for the meta-analysis was the difference in mean pain intensity, measured with a visual analog scale (VAS), between before and after the intervention, using the inverse variance method in the STATA software, version 13.0. A forest plot was used to summarize the estimates. The 5% significance level was used in the analyses.

The quality and risk of bias of the studies were independently assessed by two researchers with the JBI Critical Appraisal Checklist<sup>(15)</sup>. This instrument presents criteria to assess the

methodological quality of clinical trials, with three possible answers: "yes, this criterion is present"; "no, this criterion is not present", and "it is unclear". Each "yes" answer scores 1 point, while the other two answers score 0 points. The higher the score, the greater the internal quality and the lower the risk of bias in the study. Divergences between the researchers were solved in a consensus meeting. It was decided that studies with less than 50% of positive answers were considered low methodological quality; between 50% and 75% of positive answers, medium methodological quality; and above 75% of positive answers, high methodological quality.

## RESULTS

Initially, 344 references were found (3 in LILACS, 43 in MEDLINE, 13 in CINAHL, 45 in EMBASE, 175 in Scopus, 4 in Web of Science, 60 in Cochrane, and 1 in IBECs). After the first stage (elimination of duplicates), 244 articles remained; after the second stage (exclusion of articles after reading the titles and abstracts), 63 remained; and after the third stage (analysis of the full texts), only three articles remained in the present study, as shown in Figure 1. No reference was included in the study after manually searching them in the articles.

The information extracted from each article was organized in a spreadsheet. The main findings are summarized in Chart 2.

The articles in question were published between 2016<sup>(16)</sup> and 2019<sup>(18)</sup> and were conducted by different research groups in Turkey<sup>(16,18)</sup> and Poland<sup>(17)</sup>. Their samples ranged from 33<sup>(16)</sup> to 60<sup>(17)</sup> individuals, mostly females, aged 18 to 35 years.

The pain was a symptom common to all subjects. The clinical conditions included myofascial pain<sup>(16-18)</sup>, arthralgia<sup>(16)</sup>, and disk displacement with reduction<sup>(16)</sup>. Two methods were used as

Chart 2. Data extracted from the selected articles

Author (year of publication) Country	Sample (age, clinical condition, and treatment received)	Study comparison approach	Number of applications and duration of the treatment	Place of application and technique employed	Pain measured with a visual analog scale	Conclusion
Benlidayı et al. (2016) Turkey <sup>(16)</sup>	- 33 individuals with TMD (myofascial pain, arthralgia, and/or disk displacement with reduction). - SG: 17 individuals (mean age: 31.6 years) received the tape, counseling, and mandibular exercises. - CG: 16 individuals (mean age: 31.1 years) received counseling and mandibular exercises.	To compare the effects of counseling and mandibular exercises, either alone or in combination, with the tape on reported pain relief and functional limitation.	- One replacement per week. - Duration: 3 consecutive days per tape. - 6-week treatment.	On the skin over the masseter muscle, bilaterally, “Y” technique, with the fixed point on the TMJ, one movable point toward the nose, and the other toward the chin, both with up to 15% tension.	SG Before: 3.4±3.4 After 1 week: 1.4±1.7 After 6 weeks: 0.4±0.9 CG Before: 2.5±3.2 After 1 week: 1.8±2.5 After 6 weeks: 1.6±2.7	- In the SG, pain to palpation improved significantly in the masseter, temporal, and TMJ in the 1 <sup>st</sup> week and 6 <sup>th</sup> weeks, in comparison with the baseline value. The same did not occur with the CG.
Lietz-Kijak et al. (2018) Poland <sup>(17)</sup>	- 60 individuals (18 to 35 years old) with painful functional disorders of myofascial origin in the masticatory muscles. - SG: 30 individuals received the tape. - CG: 30 individuals were submitted to trigger point inactivation with compressions.	To compare the effects of the tape with that of trigger point inactivation with compressions on pain relief in people with TMD.	- One tape application. - Duration: 5 consecutive days.	On the skin over the masseter, bilaterally, “I” technique, no tension, with a fixed point on the TMJ, and movable points on the cheek toward the nose and chin.	SG Before: 6.5±1.7 After: 3.1±1.35 CG Before: 6.3±1.4 After: 4.2±1.4	- Both treatments significantly relieved the pain. - The tape provided greater pain relief than trigger point inactivation.
Keskinruzgar et al. (2019) Turkey <sup>(18)</sup>	- 34 individuals with nocturnal bruxism and myofascial pain. - SG: 16 individuals treated with the tape (mean age: 27.4 years). - CG: 18 individuals treated with an occlusal splint (mean age: 26.1 years).	To compare the effects of the tape with that of the occlusal splint on pain relief and amplitude of mouth opening in people with sleep bruxism and myofascial pain.	- Daily applications over 5 weeks, totaling 35 applications. - Placed in the of the day and removed by the morning, for 35 days.	On the skin over the masseter, with the “Y” technique, with 40% tension, from the origin to muscle insertion.	SG Before: 7.3±2.4 After 1 week: 3.9±2.7 After 4 weeks: 2.9±2.5 CG Before: 5.9±3.0 After 1 week: 4.6±2.6 After 4 weeks: 2.9±2.5	- Both treatments relieved the pain after 1 and 4 weeks, in comparison with the baseline value.

**Subtitle:** TMD = temporomandibular disorder; TMJ = temporomandibular joint; SG = study group; CG = comparison group

diagnostic criteria: the RDC/TMD<sup>(16,17)</sup> and the medical history with specific clinical criteria<sup>(18)</sup>.

The treatments lasted from 5 days<sup>(17)</sup> to 6 weeks<sup>(16)</sup>, and the tape was replaced either once a week<sup>(16,17)</sup> or every day<sup>(18)</sup>. In all studies, the tape was bilaterally applied to the skin over the masseter. However, the application varied between the “Y” technique<sup>(16,18)</sup> – in which one end of the tape is divided into two parts – and the “I” technique<sup>(17)</sup> – in which the tape is not divided. In the “Y” technique, the fixed point was placed

on the TMJ, while one movable point was positioned on the face, toward the nose<sup>(16)</sup>, and the other, toward the chin<sup>(16)</sup>, or both toward the angle and contour of the jaw<sup>(18)</sup> – i.e., from the origin to the muscle insertion –, both stretched up to 15% tension<sup>(16)</sup> or 40% tension<sup>(18)</sup>. In the “I” technique, two tapes were used on each hemiface. The fixed point of both tapes overlapped on the TMJ, while the movable point of one of them was placed over the cheek, toward the nose, and the other, toward the chin<sup>(17)</sup>.



All studies assessed pain intensity as an outcome<sup>(16-18)</sup>. They compared it between the group that had the kinesiology tape applied on the masseter and the group with the following therapeutic approaches: counseling and mandibular exercises<sup>(16)</sup>,

trigger point inactivation using compressions<sup>(17)</sup>, and occlusal splint<sup>(18)</sup>. Some groups of interest were treated with the tape alone<sup>(17,18)</sup> or in combination with the other approaches<sup>(16)</sup>.

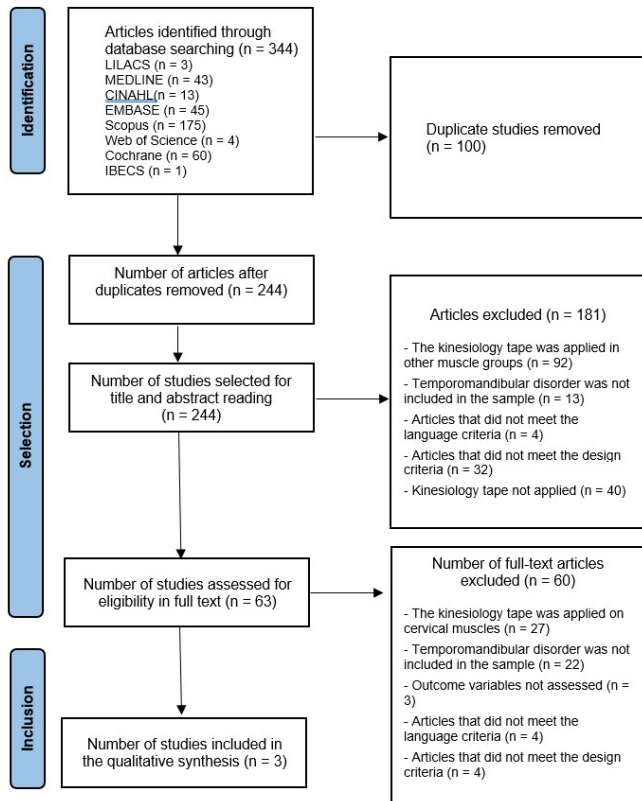
The three studies were included in the meta-analysis because all of them assessed pain intensity with VAS before and after 1 week of intervention (Figure 2). The diamond at the end of the chart is situated toward the right side and does not touch the axis – indicating that the tape application decreases pain intensity. An I<sup>2</sup> value of 0% and a p-value (Cochran’s Q test) higher than 0.05 indicate that the studies were homogeneous regarding the values they measured. In the column that describes the difference in mean values, the experimental group had 1.4 points of pain intensity decrease in VAS, with a p-value = 0.013.

The articles scored from 8 to 10 out of the total 13 points. Two studies had a medium methodological quality, and the other one had a good methodological quality. The main bias in the studies was the non-blinded research subjects and therapists – a limitation coherent with the therapeutic method used, which makes it impossible to have a placebo group. The assessment of results was another important bias, as the analyzed outcome had been self-reported by the research subjects. The methodological quality analysis and bias control are presented in Table 1.

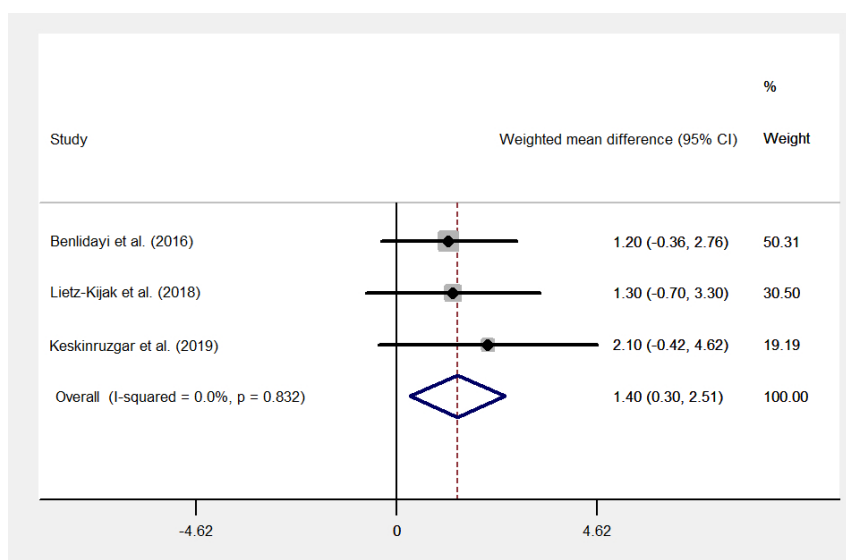
## DISCUSSION

The study revealed the main forms of applying kinesiology tape on the masticatory muscles of people with TMD; the participants, who were mostly women, were 18 to 35 years old. This population has a high prevalence of TMD-related symptoms<sup>(19)</sup>. There is yet no concrete explanation why TMD is more prevalent in women. However, studies report an influence of estrogen and women’s behavioral pattern, as they seek treatment more often<sup>(20,21)</sup>.

All articles presented pain relief in the results after using the kinesiology tape. The results presented by Benlidayi et al.<sup>(16)</sup> demonstrated that using the tape in combination with the traditional treatment eased the participants’ pain sooner.



**Figure 1.** Flowchart with the different phases of the review based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Source: Flow Diagram<sup>(14)</sup>  
**Subtitle:** n = number of articles



**Figure 2.** Forest plot of the meta-analysis of the studies  
**Subtitle:** CI = confidence interval; % = percentage

**Table 1.** Internal quality and control of the risk of bias, according to the JBI Critical Appraisal Checklist for randomized clinical trials

Question	Benlidayi et al. <sup>(16)</sup>	Lietz-Kijak et al. <sup>(17)</sup>	Keskinruzzgar et al. <sup>(18)</sup>
1	Yes	Yes	Yes
2	Yes	No	No
3	Yes	Yes	Yes
4	No	No	No
5	No	Yes	No
6	No	No	No
7	Yes	Yes	Yes
8	Yes	Yes	Yes
9	Yes	Yes	Yes
10	Yes	Yes	Yes
11	Yes	No	Yes
12	Yes	Yes	Yes
13	Yes	Yes	Yes
Total	10	9	9
% of "Yes" answers	77%	69%	69%

**Subtitle:** 1. Was true randomization used for assignment of participants to treatment groups?; 2. Was allocation to treatment groups concealed?; 3. Were treatment groups similar at the baseline?; 4. Were participants blind to treatment assignment?; 5. Were those delivering treatment blind to treatment assignment?; 6. Were outcomes assessors blind to treatment assignment?; 7. Were treatment groups treated identically other than the intervention of interest?; 8. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?; 9. Were participants analyzed in the groups to which they were randomized?; 10. Were outcomes measured in the same way for treatment groups?; 11. Were outcomes measured in a reliable way?; 12. Was appropriate statistical analysis used?; 13. Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?; % = percentage

The kinesiology tape, with its elastic polymer threads enclosed by cotton fibers, stimulates the skin, decreasing with its undulations the pressure on the sensory receptors, raising the skin, favoring blood and lymphatic circulation, promoting muscle movement, and relieving the pain through neural means<sup>(9,22)</sup>. Sensory information (e.g., touch, pressure, temperature, and pain) are picked up by somatosensory receptors located on the skin and linked to the afferent neurons, whose bodies are situated in the dorsal root ganglia in the spinal cord. The mechanical stimulation of the tape competes with the painful stimuli in the afferent pathways, inhibiting it and thus relieving the pain<sup>(22,23)</sup>.

The benefits of using kinesiology tape reported in the literature include corrected muscle function by strengthening weakened muscles, improved blood and lymphatic circulation, relieved pain by neurological suppression, and improved proprioception by increasing the excitation of skin mechanoreceptors<sup>(8,23)</sup>. Pain relief, in its turn, may have been responsible for greater mouth opening, which was verified in participants in two studies<sup>(16,18)</sup>.

None of the articles retrieved in the search applied the tape directing it from the muscle insertion to its origin – i.e., with the fixed point placed on the insertion of the muscle. The post-intervention results were positive in all studies. However, the direction in which the tape was applied diverged from both that used by some authors<sup>(9)</sup> and the principles established by Kenso Kase, whose strategy is to place the tape from the muscle insertion to its origin to inhibit muscle hyperfunction, whereas applying it from the origin to the insertion increases the activity of weakened muscles<sup>(8)</sup>.

Nevertheless, the technique employed in the studies was efficient and did not have a negative impact on the participants, according to the reported results. This suggests that the direction

of the application (i.e., where the fixed point is placed) is not as important to obtaining the therapeutic effects – which seem to be more related to the skin sensory stimulation of the tape than the direction in which it is applied. Contrary to the technique, the time of use and number of replacements varied considerably between the studies; in this regard, no specific research was found defining these criteria. It must be pointed out, though, that even a 5-day use<sup>(17)</sup> was enough to obtain reported benefits.

All studies assessed the pain as an outcome after 1 week of application, which enabled the meta-analysis of the difference in pain intensity between before and after 1 week of intervention. Using the tape obtained better results than the other researched approaches, which may be due to the short intervention. Other therapeutic approaches may be more efficient in longer interventions. Further research is needed, such that includes among its variables the duration of the tape benefits – i.e., how long the symptom improvements last after discontinuing the applications. The studies demonstrate positive results from tape application, both alone and in combination with other treatments, which suggests that using it may be beneficial in TMD treatment. Nonetheless, the few studies with this resource are insufficient to clarify its effects on painful symptoms. Moreover, the samples are small, and the studies have methodological biases. Future research, especially randomized clinical trials, is necessary to carefully investigate different tape use techniques and durations.

## CONCLUSION

The literature review suggests that using kinesiology tape on the masseter relieves the pain after 1 week of treatment, in comparison with other conservative interventions. However, the few studies and their biases prevent the identification of the actual effects of this resource.

## REFERENCES

- List T, Jensen RH. Temporomandibular disorders: old ideas and new concepts. *Cephalalgia*. 2017;37(7):692-704. <http://dx.doi.org/10.1177/0333102416686302>. PMID:28068790.
- Valesan LF, Da-Cas CD, Réus JC, Denardin ACS, Garanhani RR, Bonotto D, et al. Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis. *Clin Oral Investig*. 2021;25(2):441-53. <http://dx.doi.org/10.1007/s00784-020-03710-w>. PMID:33409693.
- American Association of Dental Research. Temporomandibular Disorders (TMD) [Internet]. 2015 [citado em 2020 Abr 10]. Disponível em: <https://www.iadr.org/aadr/about-us/policy-statements/science-policy/temporomandibular-disorders-tmd>
- Ohrbach R, editor. Diagnostic criteria for temporomandibular disorders: assessment instruments. Version 15 May 2016 [Critérios de Diagnóstico para Desordens Temporomandibulares: protocolo clínico e instrumentos de avaliação: Brazilian Portuguese Version 25 May 2016]. RDC/TMD; 2016.
- Motta LJ, Bussadori SK, Godoy CLH, Biazotto-Gonzalez DA, Martins MD, Silva RS. Disfunção temporomandibular segundo o nível de ansiedade em adolescentes. *Psicol, Teor Pesqui*. 2015;31(3):389-95. <http://dx.doi.org/10.1590/0102-37722015031899389395>.

6. Carrara SV, Conti PCR, Barbosa JS. Termo do primeiro consenso em disfunção temporomandibular e dor orofacial. *Dental Press J Orthod.* 2010;15(3):114-20. <http://dx.doi.org/10.1590/S2176-94512010000300014>.
7. Torres F, Campos LG, Fillipini HF, Weigert KL, Vecchia GFD. Efeitos dos tratamentos fisioterapêutico e odontológico em pacientes com disfunção temporomandibular. *Fisioter Mov.* 2012;25(1):117-25. <http://dx.doi.org/10.1590/S0103-51502012000100012>.
8. Kase K, Wallis J, Kase T. *Clinical therapeutic applications of the Kinesio Taping Method.* 2nd ed. Tokyo: Ken Ikai; 2003. p. 19-39.
9. Hernandez NCJ, Ribeiro LL, Gomes CF, Silva AP, Dias VF. Speech therapy in temporomandibular dysfunction in two cases: comparative analysis of the effect of traditional therapy and the use of the therapeutic bandage associated. *Distúrb Comun.* 2017;29(2):251-61. <http://dx.doi.org/10.23925/2176-2724.2017v29i2p251-261>.
10. Sobhani V, Shamsoddini A, Khatibi-Aghda A, Mazloum V, Kia HH, Meybodi MKE. Differences among effectiveness of dry needling, manual therapy, and Kinesio Taping® methods for the management of patients with chronic myofascial neck pain: a single-blind clinical trial. *Trauma Mon.* 2017;22(6):e39261.
11. Kavlak B, Bakar Y, Sarı Z. Investigation of the efficacy of different physiotherapy methods for neck pain. *J Musculoskeletal Pain.* 2012;20(4):284-91. <http://dx.doi.org/10.3109/10582452.2012.733802>.
12. Dlkhoush CT, Bakhshi S, Farokhi ZS, MirmohammadKhani M. Comparison of dry needling and inhibitory kinesio taping on the pain and functional disability in females with myofascial pain syndrome in upper trapezius muscle. *Koomesh.* 2019;21(4):610-8.
13. Silva AP, Carvalho ARR, Sassi FC, Silva MAA. Os efeitos da bandagem elástica no músculo trapézio em adultos saudáveis. *CoDAS.* 2019;31(5):e20180077. <http://dx.doi.org/10.1590/2317-1782/20192018077>. PMID:31644716.
14. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372(71):n71. <http://dx.doi.org/10.1136/bmj.n71>. PMID:33782057.
15. The Joanna Briggs Institute. JBI critical appraisal checklist for cohort studies [Internet]. 2020 [citado em 2020 Abr 10]. Disponível em: [https://joannabriggs.org/ebp/critical\\_appraisal\\_tools](https://joannabriggs.org/ebp/critical_appraisal_tools)
16. Benlidayi IC, Salimov F, Kurkcu M, Guzel R. Kinesio Taping for temporomandibular disorders: single-blind, randomized, controlled trial of effectiveness. *J Back Musculoskeletal Rehabil.* 2016;29(2):373-80. <http://dx.doi.org/10.3233/BMR-160683>. PMID:26966829.
17. Lietz-Kijak D, Kopacz L, Ardan R, Grzegocka M, Kijak E. Assessment of the Short-Term Effectiveness of kinesiotaping and trigger points release used in functional disorders of the masticatory muscles. *Pain Res Manag.* 2018;2018:5464985. <http://dx.doi.org/10.1155/2018/5464985>. PMID:29861804.
18. Keskinruzgar A, Kucuk AO, Yavuz GY, Koparal M, Caliskan ZG, Utkun M. Comparison of kinesio taping and occlusal splint in the management of myofascial pain in patients with sleep bruxism. *J Back Musculoskeletal Rehabil.* 2019;32(1):1-6. <http://dx.doi.org/10.3233/BMR-181329>. PMID:30475753.
19. Figueiredo VMG, Cavalcanti AL, Farias ABL, Nascimento SR. Prevalência de sinais, sintomas e fatores associados em portadores de disfunção temporomandibular. *Acta Sci Health Sci.* 2009;31(2):159-63.
20. Ferreira CLP, Silva MAMR, Felício CM. Sinais e sintomas de desordem temporomandibular em mulheres e homens. *CoDAS.* 2016;28(1):17-21. <http://dx.doi.org/10.1590/2317-1782/20162014218>. PMID:27074184.
21. Moreno AGUT, Bezerra AGV, Alves-Silva EG, Melo EL, Gerbi MEMM, Bispo MEA, et al. Influência do estrogênio na modulação da dor na disfunção temporomandibular e sua prevalência no sexo feminino: revisão integrativa. *Res Soc Dev.* 2021;10(2):e38510212453. <http://dx.doi.org/10.33448/rsd-v10i2.12453>.
22. Artioli DP, Bertolini GRF. Kinesio taping: aplicação e seus resultados sobre a dor: revisão sistemática. *Fisioter Pesqui.* 2014;21(1):94-9. <http://dx.doi.org/10.1590/1809-2950/553210114>.
23. Guyton AC, Hall JE. *Tratado de fisiologia médica.* 11ª ed. Rio de Janeiro: Elsevier; 2011.