

Systematic Review

The Impact of Kinesio Taping on Postoperative Pain, Edema, and Trismus After Mandibular Third-Molar Surgery: A Systematic Review and Meta-Analysis

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Abstract

Background surgical extraction of impacted mandibular third molars is frequently associated with postoperative pain, swelling and trismus. Kinesio Taping (KT) has been proposed as a non-pharmacological adjunct therapy, despite evidence remaining inconclusive. Methods: a systematic review and meta-analysis were conducted according to PRISMA guidelines and registered in PROSPERO (CRD420251120841). PubMed, Scopus, and Web of Science were searched from January 2010 to October 2025. Randomized controlled trials evaluating KT after mandibular third-molar extraction were included. Risk of bias was assessed using the revised Cochrane Risk-of-Bias Tool (RoB 2.0). Results: Ten randomized controlled trials (442 patients) were included. KT significantly reduced postoperative pain in the early postoperative period (MD -2.06 VAS units, 95% CI -3.15 to -0.96 ; $p = 0.0002$; $I^2 = 97\%$) and at day 7 (MD -0.78 , 95% CI -1.52 to -0.05 ; $p = 0.04$; $I^2 = 99\%$). Facial edema was reduced in the early postoperative period (SMD -1.46 , 95% CI -2.47 to -0.45 ; $p = 0.005$; $I^2 = 95\%$), though estimates should be interpreted with caution given the methodological heterogeneity. No significant reduction was observed at day 7 (SMD -0.33 , 95% CI -0.92 to 0.27 ; $p = 0.28$; $I^2 = 87\%$). Mouth opening improved in both the early (MD -2.78 mm; $I^2 = 100\%$) and late periods (MD -4.63 mm; $I^2 = 87\%$). The overall certainty of evidence was rated as very low (GRADE). Conclusion: KT may reduce pain and trismus after third-molar extraction, with a reduction in facial swelling. Due to very high heterogeneity, high risk of bias, and very low certainty of evidence, these findings should be interpreted with caution. Further high-quality placebo-controlled trials are needed.



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Keywords: kinesio tape; third molar; postoperative; oral surgery; meta-analysis

1. Introduction

Surgical extraction of impacted mandibular third molars is the most frequently performed procedure in oral and maxillofacial surgery [1]. The decision to surgically remove an impacted mandibular third molar requires careful evaluation, considering possible postoperative complications and contraindications [2]. Postoperative swelling, post-extraction swelling, pain, and trismus are the most common non-infectious complications. These

result from surgical trauma and are associated with the manipulation of periodontal tissues, causing pain and swelling. These complications often negatively affect the patient's quality of life [3,4]. Surgical trauma is mainly produced by mucosal incision, elevation of the mucoperiosteal flap, removal of bone tissue, and retraction of the surgical flap [5]. Although several methods have been described in the literature, there is still no reliable and effective technique that can significantly reduce the likelihood of these complications [3,5]. Alternative methods include pharmacotherapy, laser application, drainage, cryotherapy, and, more recently, the use of Kinesio Tape (KT) [6]. KT, developed by Kase in the 1970s, is an elastic therapeutic tape designed to improve lymphatic and blood circulation by gently lifting the skin and reducing tissue pressure. These effects may contribute to a reduction in postoperative edema, pain, and functional limitations [7,8]. Although KT has been widely used for the rehabilitation of sports-related injuries, recent studies have suggested its benefits for reducing inflammation, pain, and trismus after oral and maxillofacial surgery [6,8]. However, few have specifically focused on its effectiveness following third-molar extraction [6]. Several authors have reported favorable outcomes with KT following mandibular third-molar surgery [3,9,10], while others have reported its favorable use in orthognathic surgery [11], after internal fixation of mandibular fractures [12], in facial fractures [13], and in temporomandibular disorders [14], among other cases. Pharmacological treatments have been shown to provide greater overall pain relief during the early postoperative days compared with KT alone. Nevertheless, KT may complement pharmacological management by promoting lymphatic drainage and reducing inflammatory mediators through increased interstitial fluid flow, potentially contributing to faster resolution of swelling and associated discomfort [6]. Although several systematic reviews have previously evaluated the use of Kinesio Taping following third-molar surgery, the available evidence remains heterogeneous because of differences in study design, KT application protocols, outcome assessment methods, and sample sizes. Furthermore, several randomized controlled trials have been published in recent years, providing additional evidence that has not been consistently incorporated into previous quantitative syntheses. Therefore, an updated systematic review and meta-analysis was conducted to reassess the effectiveness of KT in reducing postoperative pain, swelling, and trismus following mandibular third-molar extraction. The research question, formulated according to the PICO framework, was: In patients undergoing surgical extraction of impacted mandibular third molars (Population), does the postoperative application of Kinesio Taping (Intervention), compared with placebo taping or no intervention (Comparison), reduce postoperative pain, facial swelling, and trismus (Outcomes)? Secondary objectives were to evaluate the effect of KT on analgesic consumption and to identify any adverse effects associated with its use.

2. Materials and Methods

The protocol for this systematic review and meta-analysis followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement [15] and was registered in PROSPERO (CRD420251120841). The main goal was to gather the best available evidence to answer the specific PICO question: "Can the use of Kinesio Tape improve postoperative discomfort after the extraction of impacted mandibular third molars?"

Inclusion criteria (PICO):

- Population: patients who underwent surgery for impacted mandibular third molars.
- Intervention: Kinesio Tape (KT)
- Comparison: placebo taping or no intervention (medication included in both groups).
- Outcome: postoperative swelling/edema, pain, and mouth opening (primary outcomes); postoperative complications and side effects (secondary outcomes).

Studies were included if they were controlled or randomized clinical trials, had at least five participants per group, reported and assessed postoperative swelling, pain, mouth opening, or other relevant outcomes.

Exclusion criteria: Studies were excluded if they did not meet the above criteria, included patients allergic to KT, or were case reports, narrative or systematic reviews, letters to the editor, animal studies, or in vitro studies. Studies not written in English or published before 2010 were also excluded.

Electronic search: The electronic search was conducted from January 2010 until October 2025. Three electronic databases were searched: PubMed, Scopus, and Web of Science. The search was limited to human studies written in English and available in full text. The search terms used were: ("Kinesio taping" OR "Elastic therapeutic tape" OR "Kinesiologic tape") AND ("Pain" OR "Postoperative pain") AND ("Trismus" OR "Limited mouth opening") AND ("Edema" OR "Swelling") AND ("Third molar" OR "Wisdom tooth") AND ("Tooth extraction" OR "Surgical extraction" OR "Oral surgery").

Detection methods: Two independent reviewers (R.P.R. and B.G.N.) screened titles and abstracts. Both reviewers selected the full-text articles of studies that met the inclusion criteria, as well as those whose titles and abstracts did not provide enough information to make a clear decision. Inter-reviewer agreement was assessed using Cohen's kappa.

Risk of bias assessment: The risk of bias of the randomized clinical trials included in this review was assessed using the Revised Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2.0) [16], which evaluates five domains: bias arising from the randomization process (D1), bias due to deviations from intended interventions (D2), bias due to missing outcome data (D3), bias in measurement of the outcome (D4), and bias in selection of the reported result (D5). Each domain was judged as 'Low risk', 'Some concerns', or 'High risk'.

Statistical analysis: A meta-analysis was conducted using the randomized controlled trials included in this review. For continuous outcomes, mean differences (MD) with 95% confidence intervals (CI) and *p*-values were calculated when outcomes were reported using the same measurement scale or unit. When continuous outcomes were assessed using different measurement methods or scales across studies, standardized mean differences (SMD) with 95% confidence intervals were calculated to allow for quantitative synthesis. Before quantitative synthesis, all pain scales were homogenized to a common metric (0–10 scale) to ensure comparability across studies. Analyses were stratified by postoperative period (early postoperative: days 2–3; late postoperative: day 7). Between-study heterogeneity was assessed using the I^2 statistic and was found to be high in several analyses, which was reported alongside the pooled estimates. Analgesic consumption and adverse events were summarized descriptively. The meta-analysis was performed using Review Manager (RevMan), version 5.4.1 (The Cochrane Collaboration, London, UK). A fixed-effects model was applied when heterogeneity was low ($I^2 < 50\%$), whereas a random-effects model with restricted maximum likelihood (REML) estimation was used when heterogeneity was substantial ($I^2 \geq 50\%$), in accordance with standard methodological recommendations. Additional statistical analyses were performed using IBM SPSS Statistics for Mac, Version 31.0 (IBM Corp., Armonk, NY, USA).

The potential for publication bias was not formally assessed through funnel plots or statistical tests (e.g., Egger's test), as fewer than ten studies contributed to most pooled analyses, which is insufficient for reliable detection of small-study effects [16]. The risk of publication and reporting bias was, however, considered high, given that the literature search was restricted to English-language publications in indexed journals, and all included studies reported positive effects of KT.

The certainty of the evidence for each primary outcome was assessed using the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) ap-

proach [17]. Evidence from randomized controlled trials was rated as high-certainty evidence and subsequently downgraded based on the following domains: risk of bias, inconsistency, indirectness, imprecision, and publication bias. The overall certainty of evidence was rated as very low for all three primary outcomes (pain, swelling, and trismus), primarily due to the high risk of bias related to lack of blinding, substantial statistical heterogeneity ($I^2 \geq 85\text{--}100\%$), and the small total sample sizes contributing to each pooled estimate.

Two independent reviewers (R.P.R. and B.G.N.) extracted the data using a standardized data collection form. The following information was collected from each study: first author, year of publication, study design, sample size, participant characteristics, intervention protocol, control intervention, follow-up period, and outcome measures related to pain, swelling, mouth opening, and adverse events. Pain was assessed using Visual Analog Scale (VAS) scores. Trismus was assessed as maximum mouth opening measured in millimeters, while swelling was assessed according to the method reported in each study, including linear facial measurements, volumetric assessment, or photographic analysis. Any disagreements were resolved through discussion and consultation with a third reviewer (J.L.L.).

3. Results

3.1. Study Selection

The study selection process followed PRISMA principles (Figure 1). In the initial search, 62 articles were retrieved from PubMed, 49 from Scopus, and 33 from Web of Science, yielding a total of 144 records. After removing 9 duplicate records and 2 records flagged as ineligible by automated tools, 133 records were screened by title and abstract. Of these, 94 were excluded as they did not meet the inclusion criteria (no use of KT, or studies unrelated to third-molar extraction). Thirty-nine reports were sought for full-text retrieval, of which 19 were not retrieved. Twenty full-text articles were assessed for eligibility, and 10 trials were excluded for the following reasons: 5 included cryotherapy, 1 compared KT with analgesics, 2 compared it with drainage tubes, and 2 did not assess the required parameters (evaluating only quality of life). In total, 10 clinical trials were included in this review. The Cohen's kappa was 0.89 for Pubmed and 1 for Scopus and Web of Science.

3.2. Characteristics of Included Studies

This review comprised 10 randomized clinical trials (RCTs), including a total of 442 patients who underwent surgical extraction of impacted mandibular third molars. The general characteristics of these studies are summarized in Table 1. The included population consisted of 124 men and 228 women, reported in eight of the ten studies [3,9,18–25]; two authors did not specify patients' gender [20,24]. The mean age reported across studies was 26.5 years, and all authors stated that there were no significant differences in age or gender between groups [3,9,18–25]. The earliest study included was published by Ristow et al. in 2014 [9], and the most recent by Teke et al. in 2026 [24]. Five studies used a split-mouth design, in which patients received KT on one side of the mouth and no intervention on the other [18–20,22,25]; the remaining five studies followed a parallel design [3,9,21,23,24], one of which also used placebo taping on the control side [23]. All patients received postoperative medication. Most studies reported a standard combination of antibiotics and analgesics, except for Plawecki [21], who did not mention antibiotic use, and Patil [20], who only specified that the same medication was administered for all interventions. The tape remained in place for 5 to 7 days (except in one study that allowed 3 to 5 days [20]). Postoperative swelling, pain, and trismus were recorded in all studies. The included studies shared similar clinical characteristics: most evaluated Pell

& Gregory class II–III molars, with comparable levels of surgical difficulty in all cases. Surgical duration also showed no relevant differences between KT and control groups, suggesting that the improvements observed were directly related to KT application rather than operative variables.

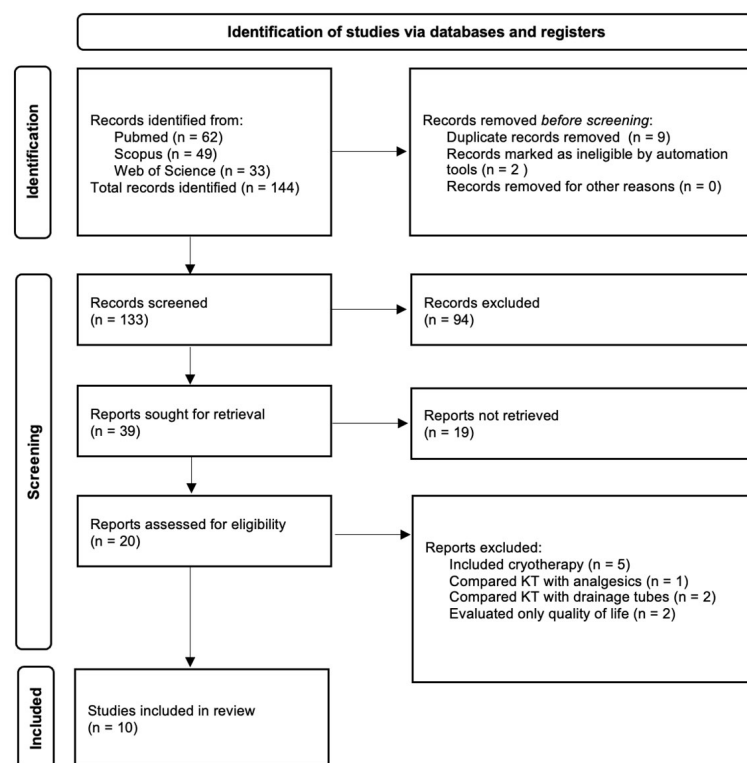


Figure 1. Flow diagram of the search and study selection process (n = number of articles).

Table 1. Characteristics of the included studies. RCT: randomized controlled trial; NR: not reported; K: Kinesio group; C: control group; P: placebo group; VAS: Visual Analog Scale; M: male; F: female.

Author (Years)	Type of Study	Type of Impaction	Number of Subjects	Age (Years)	Groups	Time with KT (Days)	Follow Up (Days)	Measurement	Results
da Rocha 2020 [18]	Split-mouth RCT	Position C	13 (5M, 8F)	23.35	KT/No intervention	5	2, 5	Pain–VAS Edema—linear measurement (Marković-Todorović method)	Edema—decrease Pain—decrease
Gözlüklü 2020 [19]	Split-mouth RCT	Class II position B & C	15 I (6M, 9F) 15 II (8M, 7F)	22.28	KT/No intervention	5	2, 7	Pain–VAS Edema—3D volumetric analysis (3D facial scanner) Trismus—maximum mouth opening measured with a digital caliper	Edema—not clear Pain—decrease Trismus—decrease
Jaroń 2021 [3]	RCT	NR	50K (14M, 36F) 50C (12M, 38F)	K 26.5 C 25	KT/No intervention	5	3, 7	Pain–VAS Edema—five-line measurement using an elastic tape Trismus—maximum mouth opening with a caliper	Edema—decrease Pain—decrease Trismus—decrease

Table 1. Cont.

Author (Years)	Type of Study	Type of Impaction	Number of Subjects	Age (Years)	Groups	Time with KT (Days)	Follow Up (Days)	Measurement	Results
Patil 2023 [20]	Split-mouth RCT	NR	15 (6M, 9F)	29.53	KT/No intervention	7	1, 2, 7	Pain–VAS Edema–three-line measurement using a measuring tape Trismus–interincisal distance measured with a caliper	Edema—decrease Pain—decrease Trismus—decrease
Plawecki 2023 [21]	RCT	A (34%), B (66%), C (65%)—Ganss	15K (NR) 15C (NR)	C: 29.73 KT: 22.93	KT/No intervention	3–5	1, 2, 7	Pain–VAS Edema–five-line measurement Trismus–interincisal distance measured with a caliper	Edema—no difference Pain—decrease Trismus—decrease
Ristow 2014 [9]	RCT	Class II position B & C	20K (9M, 11F) 20C (10M, 10F)	>18	KT/No intervention	5	1, 2, 3, 7	Pain–VAS Edema–five-line measurement Trismus–interincisal distance measured with a caliper	Edema—decrease Pain—decrease Trismus—decrease
Russo 2025 [22]	Split-mouth RCT	Class II and A & B	7K (1M, 6F)	17–40	KT/No intervention	7	3, 7	Pain–VAS Edema–3D scanning (TrueDepth + software) Trismus–maximum mouth opening measured with a caliper	Edema—decrease Pain—decrease Trismus—decrease
Tatli 2020 [23]	RCT	Class II position B	20K (5M, 15F) 20C (3M, 17F) 20P (2M, 18F)	K 27.2 C 25.3 P 24.6	KT/Tape placebo/No intervention	5	2, 4, 7	Pain–VAS Edema–three-line measurement with a measuring tape Trismus–maximum mouth opening measured with a caliper	Edema—decrease Pain—decrease Trismus—decrease
Teke 2026 [24]	RCT	Class II position B	43K (21M, 22F) 44C (22M, 22F)	K 23.5 C 23.5	KT/No intervention	7	2, 4, 7	Pain–VAS Edema–five-point measurement using a measuring tape Trismus–interincisal distance measured with a caliper	Edema—decrease Pain—decrease Trismus—decrease
Yurttutan 2020 [25]	Split-mouth RCT	Class I-II position B	60 (NR)	18–35	KT/No intervention	7	1, 2, 3, 7	Pain–VAS Edema–three-line measurement + VAS Trismus–maximum mouth opening measured with a caliper	Edema—not clear Pain—decrease Trismus—decrease

3.3. Risk-of-Bias Assessment

The risk-of-bias analysis is presented in Table 2.

Overall, the methodological quality of the included studies was acceptable in terms of randomization. However, a critical limitation across the body of evidence is the near-universal absence of blinding. Nine of ten trials compared KT against no intervention rather than sham taping; only Tatli et al. [23] included a placebo arm. For subjective, patient-reported outcomes such as VAS pain scores, the lack of participant and assessor blinding represents a serious source of performance and detection bias. It is plausible that a substantial proportion of the observed pain reduction in KT groups reflects expectation or

placebo effects rather than a true physiological benefit of the tape. This limitation is reflected in the RoB 2.0 ratings, where D2 (bias due to deviations from intended interventions) and D4 (bias in measurement of the outcome) were rated as high risk in the majority of studies.

Table 2. Risk-of-bias assessment of the included studies. D1: randomization. D2: deviations from intervention. D3: missing outcome data. D4: outcome measurement. D5: selection of reported result.

Author	D1	D2	D3	D4	D5	Overall
da Rocha 2020 [18]	Low	High	Some concerns	High	Low	High
Gözlüklü 2020 [19]	Low	High	Low	High	Low	High
Jaroń 2021 [3]	Low	High	Low	High	Low	High
Patil 2023 [20]	Low	High	Low	High	Some concerns	High
Plawecki 2023 [21]	Low	High	Low	Some concerns	Low	High
Ristow 2014 [9]	Low	High	Low	High	Low	High
Russo 2025 [22]	Low	Some concerns	Low	Low	Low	Some concerns
Tatli 2020 [23]	Low	Low	Low	Low	Low	Low
Teke 2026 [24]	Low	Some concerns	Low	Some concerns	Some concerns	Some concerns
Yurttutan 2020 [25]	Low	High	Low	High	Low	High

D2 is rated high for most studies because 9/10 used no-intervention controls with no blinding of participants—this maps directly to performance bias in RoB 2.0 terms. D4 is high where outcome assessors were also unblinded.

3.4. Clinical Outcomes

3.4.1. Pain

All studies assessed pain subjectively using the Visual Analog Scale (VAS) where zero indicated no pain, five indicated moderate pain, and ten indicated severe pain. All studies [9,18,21,23–25] reported the VAS on a 0–10 scale except for Jaron et al. [3], who used a 0–100 scale. To ensure comparability across studies, the scores reported by Jaron et al. were divided by 10, thereby standardizing all pain measurements to a common 0–10 scale before analysis. All authors reported a significant reduction in pain in the KT group compared with the control group [3,9,18–25], although one author noted that since no standardized analgesic or rescue medication protocol was used in their study, it is unclear whether KT actually improved postoperative pain [19]. Several studies reported a marked decrease in pain levels within the first postoperative days (days 2–3) [18,19], while in others, the difference remained significant up to day 7 [20,22,23]. Overall, all studies showed a consistent reduction in pain on the KT side compared with the control side [3,9,18–25]. These findings are consistent with those of Ristow et al. [9], who observed the same trend in pain reduction using VAS-based measurements. The forest plots (Figure 2) show a significant reduction in pain in the KT group compared with the control group, particularly on postoperative days 2–3 (Figure 2a). Specifically, four authors [9,18,19,24] reported a statistically significant negative difference in VAS scores, while Patil et al. [20] and Plawecki et al. [21] found no relevant differences. The forest plot confirms this finding, showing a mean difference MD of -2.06 (95% CI: -3.15 to -0.96 ; $p = 0.0002$; $I^2 = 97\%$), indicating less pain in the KT group during the period of greatest symptom intensity. On postoperative day 7 (Figure 2b), several studies [9,19,24] still observed significant differences favoring KT, while two [20,21] reported no relevant effect, and Yurttutan et al. [25] could not be

estimated. The meta-analysis of these studies (see Figure 2) showed a smaller but still significant reduction in pain, with an MD of -0.78 (95% CI: -1.52 to -0.05 ; $p = 0.04$; $I^2 = 99\%$). It is worth noting the high heterogeneity observed in both analyses ($I^2 = 97\%$ and 99% , respectively).

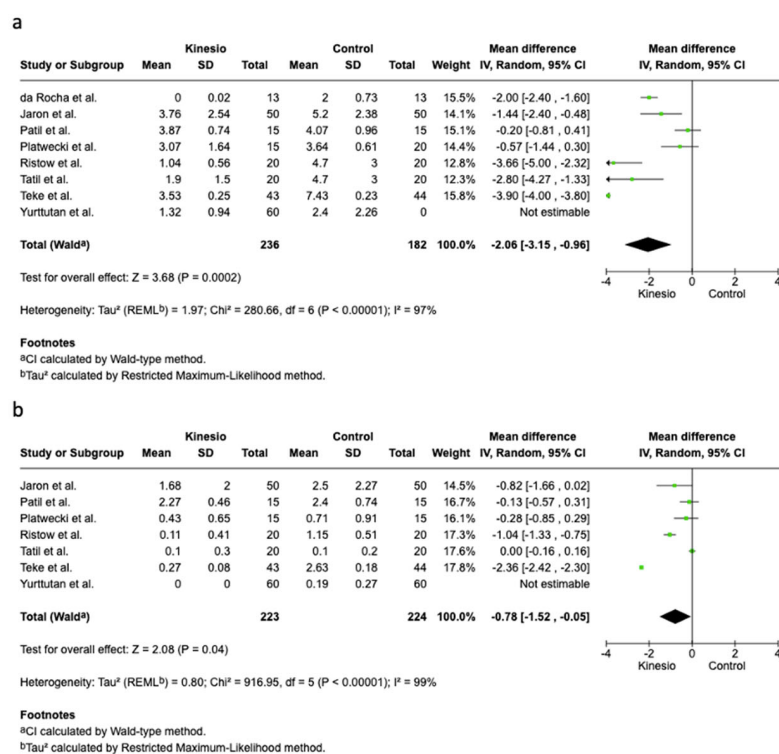


Figure 2. Forest plot comparison: KT group vs. control group. Outcomes: pain. (a) Early pain (day 2–3); (b) late pain (day 7) [3,9,18,20,21,23–25]. Random-effects model (REML). Weights and 95% confidence intervals shown per study. I^2 and τ^2 reported per panel.

To contextualize the clinical relevance of these findings, the minimally clinically important difference (MCID) for VAS pain on a 0–10 scale has been reported as 1.0–1.3 units [26]. The early postoperative pain reduction observed in this review (MD -2.06) exceeds this threshold and may therefore be considered clinically meaningful for patients during the period of peak postoperative discomfort. In contrast, the late postoperative reduction (MD -0.78) falls below the accepted MCID, indicating that while this difference reached statistical significance, it is unlikely to represent a perceptible clinical benefit for patients at day 7.

3.4.2. Trismus

Postoperative trismus was another commonly evaluated parameter, recorded as a reduction in maximum mouth opening measured with a caliper before surgery and on specific postoperative days up to day seven. All authors who assessed this variable reported a significant reduction in trismus after the application of KT following third-molar surgery. Several authors found that the KT group showed a significant improvement in mouth opening compared with the control group, particularly on postoperative days 2, 3, and 7 [3,19,25]. Similarly, another study reported an objective functional improvement in the KT group as early as the first postoperative day [20]. Although all studies that measured trismus reported positive results in favor of KT, the effect was more evident in those with short-term follow-up (≤ 3 days). In contrast, the sustained benefits up to day 7 were more variable, possibly influenced by the type of impaction or by differences in the KT application protocol. The pooled data on trismus consistently show better

preservation of mouth opening in patients treated with Kinesio Tape (KT). In the analysis of postoperative days 2–3 (Figure 3a), several authors observed clear and statistically significant differences favoring the KT group [9,19,24,25], while others found no relevant results [20,21]. The quantitative synthesis revealed a mean difference of -2.78 mm (95% CI: -5.06 to -0.50 ; $p = 0.02$; $I^2 = 100\%$), indicating that the KT group experienced less loss of mouth opening during this early phase. By the seventh postoperative day (Figure 3b), the same trend persisted: nearly all included studies, except for Plawecki et al. [21], showed significant differences, with reductions ranging from -2.8 mm to -6 mm compared with the control group. The meta-analysis demonstrated an even more pronounced mean difference (-4.63 mm; 95% CI: -6.35 to -2.91 ; $p < 0.00001$; $I^2 = 87\%$). Although heterogeneity remained high in both analyses ($I^2 = 100\%$ for days 2–3 and 87% for day 7), the direction of the effect was consistent, reinforcing the conclusion that KT helps reduce functional limitation caused by trismus following third-molar surgery.

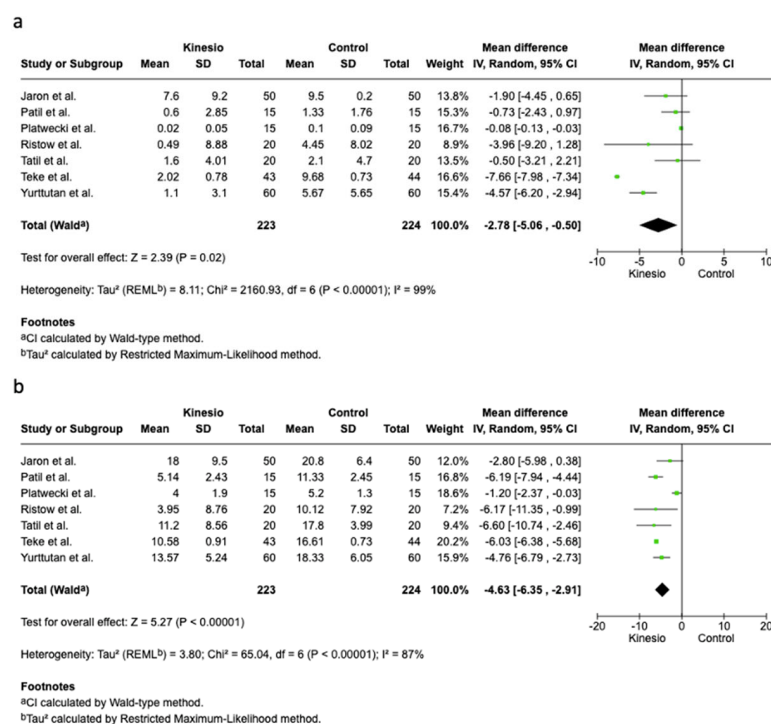


Figure 3. Forest plot comparison: KT group vs. control group. Outcomes: trismus. (a) Early trismus (day 2–3); (b) late trismus (day 7) [3,9,20,21,23–25]. Random-effects model (REML). Weights and 95% confidence intervals shown per study. I^2 and τ^2 reported per panel.

3.4.3. Edema

In several studies, a significant decrease in tissue edema was reported, particularly between postoperative days 2 and 3, which is typically when inflammation reaches its peak [22,24]. The meta-analysis for days 2–3 (Figure 4a) showed a significant reduction in the KT group compared with the control group. Most authors reported statistically significant negative differences [9,18,23–25], whereas Patil et al. [20] and Plawecki et al. [21] found no relevant results. The pooled analysis confirmed a standardized mean difference SMD of -1.46 (95% CI: -2.47 to -0.45 ; $p = 0.005$; $I^2 = 95\%$), indicating an overall reduction in edema in favor of KT during this early postoperative phase. However, heterogeneity was high ($I^2 = 95\%$). By postoperative day 7 (Figure 4b), some studies—such as those by Ristow et al. [9] and Teke et al. [24]—reported a sustained benefit with KT, while others found no statistically significant differences [19,20,22,24]. The combined result at day 7 showed an SMD of -0.33 (95% CI: -0.92 to 0.27 ; $p = 0.28$), which did not reach statistical

significance. This finding should be interpreted with caution, as the confidence interval crosses the null and heterogeneity remained high ($I^2 = 87\%$).

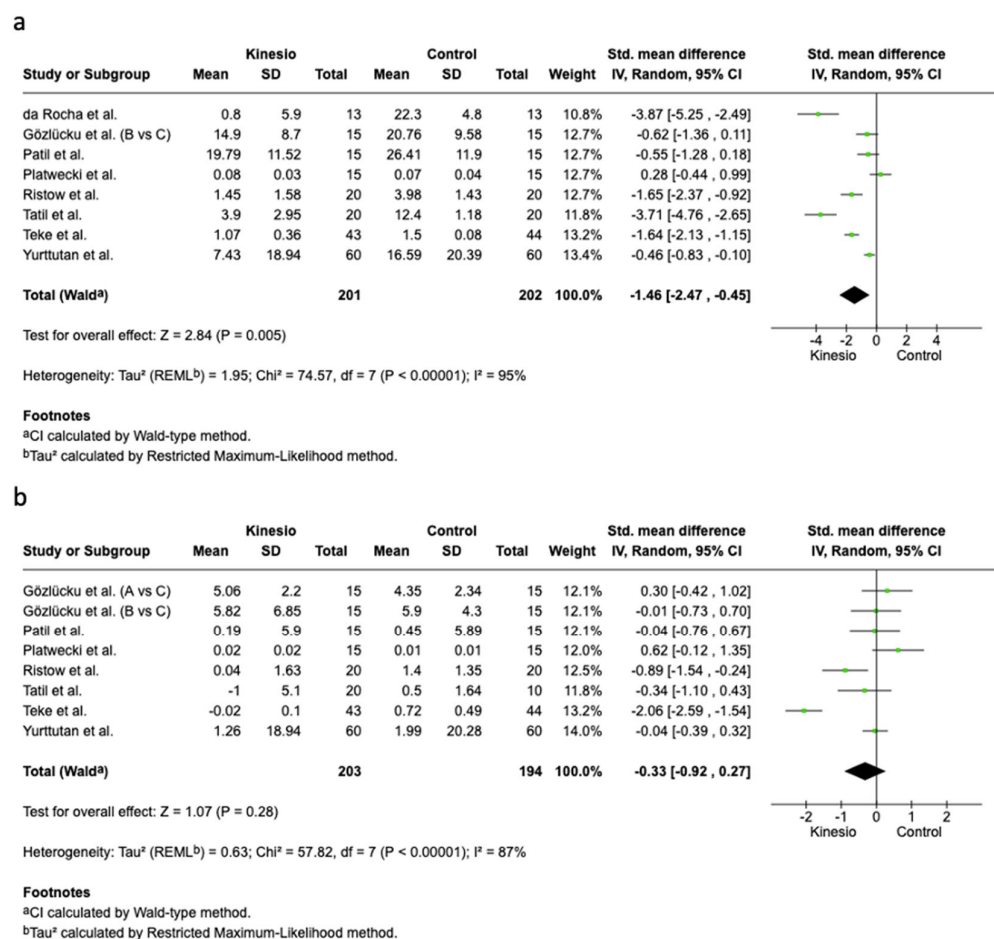


Figure 4. Forest plot comparison: KT group vs. control group. Outcomes: edema. (a) Early edema (day 2–3); (b) late edema (day 7) [3,9,18–21,23–25]. Random-effects model (REML). Weights and 95% confidence intervals shown per study. I^2 and τ^2 reported per panel.

3.4.4. Others

Several authors also confirmed the usefulness of KT in controlling local inflammation, suggesting a clinically relevant lymphatic drainage effect that may serve as a complement or alternative to steroids or other adjuvant medications [3,9,18,20–25]. On the other hand, two authors found no statistically significant differences when evaluating edema [19,21]. In one study, a clinically significant difference was observed: ecchymosis at the base of the mandible was reported on the non-taped side in 30.8% of patients, 120 h after surgery; this finding was not present on the side treated with Kinesio Tape, highlighting its beneficial effects [18]. Five studies reported a significant improvement in postoperative quality of life among patients in the KT group. This improvement was reflected in reduced symptoms (pain, swelling, and trismus), faster functional recovery, and lower analgesic use [9,20,21,24,25]. In particular, Yurttutan et al. concluded that KT, in addition to its clinical effectiveness, represents a more cost-effective and less invasive therapeutic option compared with conventional approaches—an assertion that is indirectly supported by most of the included studies [25]. No postoperative complications or adverse effects related to Kinesio Taping were reported in any of the included studies.

3.5. Certainty of Evidence

The certainty of evidence was assessed using the GRADE framework for each primary outcome. All three outcomes—pain, swelling, and trismus—were rated as very low certainty. Ratings were downgraded due to: (1) serious risk of bias, as the majority of included studies lacked blinding of participants and outcome assessors; (2) serious inconsistency, with I^2 values ranging from 85% to 100% across analyses; and (3) serious imprecision, as most individual studies had small sample sizes and wide confidence intervals. These ratings indicate that the true effect of KT may differ substantially from the pooled estimates reported here, and the results should be interpreted with considerable caution.

4. Discussion

The aim of this review was to evaluate the effect of neuromuscular taping following the surgical extraction of the lower third molar. The hypothesis was that the postoperative application of KT could effectively reduce signs and symptoms such as pain, swelling, and trismus, thereby improving patient comfort. After analyzing 10 clinical studies, the results generally supported this hypothesis, demonstrating that KT may be a useful and complementary adjunctive tool in postoperative patient management.

All included studies evaluated outcome parameters such as pain, swelling, and mouth opening, and most reported significant improvements in the KT groups compared with the control groups. Moreover, patients' mood and overall quality of life improved significantly [3]. This suggests that, overall, KT has a clinically relevant effect in reducing postoperative discomfort [3,9,18–25]. It is important to note that the results related to swelling could have been influenced by differences in the measurement methods used across studies. While some authors measured linear distances between facial landmarks, others used volumetric estimates or photographic assessment, introducing considerable variability in the results. This methodological heterogeneity may have partially biased the overall meta-analysis estimates, helping to explain the dispersion observed in the forest plots. Therefore, the pooled estimates for edema should be interpreted with caution, as the lack of a standardized assessment method likely contributed to the substantial heterogeneity observed across studies. Most of the included studies reported significant reductions in pain in KT-treated groups. The analgesic effect of KT is attributed to its influence on cutaneous mechanoreceptors, which modulate nociceptive pathways and reduce pain perception. For example, in the study by Ristow et al. [9], KT was associated with a “less traumatic” postoperative experience. Moreover, KT demonstrated superior efficacy compared with the control intervention used in that study [9]. While the control groups improved over time, the KT groups experienced faster and more pronounced recovery [22]. Some studies also reported a reduced need for analgesic medication in the KT groups, which is clinically relevant and reinforces the value of this non-pharmacological intervention [21,25]; some even suggested that KT should be introduced as a standard measure in retained lower molar surgery [21]. In a recent study by Teke et al., the application of Kinesio Tape significantly increased blood flow in the cervical region after the extraction of impacted third molars, peaking on the fourth postoperative day and decreasing after tape removal. This increase in microcirculation appears to enhance lymphatic drainage and accelerate edema resolution, resulting in reduced pain and earlier recovery of mouth opening [24].

Other non-pharmacological therapies, such as cryotherapy, surgical drainage, or low-level laser therapy, have shown some effectiveness but also have limitations. Cryotherapy requires multiple daily applications; surgical drainage causes notable discomfort and requires follow-up visits; and laser therapy demands expensive equipment and trained personnel. In comparison, KT is accessible, inexpensive, and well tolerated by most

patients [25]. Most studies showed a significant reduction in facial swelling volume during the early postoperative days. This effect is explained by the lymphatic drainage mechanism provided by KT, which lifts the skin to create subcutaneous space, promoting the movement of inflammatory fluids toward regional lymph nodes, such as the supraclavicular nodes. The described application methods (Type I and Type II), which vary in tape direction and anchor points, appear to influence drainage efficacy, as demonstrated in comparative studies [19]. Seven studies reported a significant increase in postoperative mouth opening in the KT group [3,9,18,20,22–24]. This may be related to reduced edema in the masticatory muscles, especially the masseter, allowing faster functional recovery. This improvement became particularly evident from the third postoperative day onward. The results of the meta-analyses reinforce these findings, showing that KT provides clinically relevant benefits across the three main evaluated parameters. Regarding pain, the forest plots demonstrated a significant and sustained reduction, which was most pronounced during the first 2–3 days but still evident by day 7. Similarly, swelling showed a notable reduction in the acute postoperative phase, reflecting the enhanced lymphatic drainage prompted by KT, with the magnitude of this effect gradually decreasing as healing progressed, while trismus improved consistently in both the short and medium term, indicating better preservation of mouth opening.

From a clinical perspective, the pain reduction observed in the early postoperative period ($MD \approx -2.06$ VAS units) exceeds the commonly accepted MCID of 1.0–1.3 units for VAS pain [26], suggesting a potentially meaningful benefit for patients during the period of peak postoperative discomfort. However, the late postoperative pain reduction ($MD \approx -0.78$) falls below this threshold, indicating that the sustained analgesic effect of KT at day 7 may not translate into a perceptible clinical benefit. These findings should be interpreted alongside the very low certainty of evidence rating and the high risk of performance bias across the included studies.

Overall, these findings confirm that KT not only targets isolated symptoms but contributes comprehensively to reducing postoperative morbidity, enhancing both patient recovery and comfort. Although most included studies showed a positive effect of KT on pain, swelling, and trismus, not all results reached statistical significance in the meta-analyses. In the case of Plawecki et al. [21], a trend toward pain reduction was observed, though not statistically significant, while edema and trismus showed no relevant differences between groups. Similarly, Patil [20] and Tatli [23] reported clinical improvements without conclusive combined results, and the studies by Gözlüklü [19] and Yurttutan [25] presented heterogeneous or inconclusive findings, particularly concerning swelling. These discrepancies partially explain the high heterogeneity values (I^2) observed in the forest plots and highlight that, while the overall effect favors KT, methodological variability and differing measurement tools limit the strength of the evidence. Because substantial heterogeneity was observed across several outcomes, the pooled estimates should be interpreted with caution. These findings emphasize the need for standardized protocols and outcome assessment methods in future research.

Nevertheless, KT use also presents some drawbacks. Wearing adhesive tapes on the face for 4–5 days may cause cosmetic discomfort and affect social interactions, particularly in men with facial hair who must shave the area. This factor has been mentioned as a potential barrier to treatment acceptance in several studies. Additionally, KT application must be performed by a trained professional—either a physiotherapist or a surgeon specifically trained to apply the tape strategically.

Although the findings of this systematic review suggest that postoperative KT application may help reduce pain, swelling, and trismus after lower third-molar surgery, these results should be interpreted with caution due to certain limitations in the analyzed

studies. First, several studies had small sample sizes, which limit statistical power and generalizability. Moreover, substantial methodological heterogeneity existed, not only in study design—with both parallel and split-mouth models—but also in KT application techniques, which varied in location, number of strips, and direction, making direct comparison difficult. In general, the included studies shared similar KT application methods and postoperative evaluation approaches, but the tools used to measure clinical variables such as pain, swelling, and mouth opening were not entirely uniform. Differences in postoperative pharmacological protocols, including analgesic and antibiotic regimens, may have influenced pain scores and analgesic consumption. Therefore, the observed reduction in VAS scores cannot be attributed exclusively to KT in all studies. For instance, pain was assessed using visual analog scales at different postoperative times, and pharmacological protocols were not standardized across studies, which could have influenced symptom perception and progression. Furthermore, five of the ten included studies employed a split-mouth design, generating correlated within-patient data that ideally requires paired statistical analysis. Given the incomplete reporting of intra-patient correlation coefficients in the primary studies, re-analysis of these data as paired estimates was not feasible, and this should be considered a limitation when interpreting the pooled results.

Regarding pain assessment, all reported scales were homogenized before quantitative synthesis to ensure comparability across studies, and the pooled estimates therefore represent a common metric, making the use of mean difference appropriate.

The search strategy may have been limited in sensitivity, as the three symptom blocks (pain, trismus, and edema) were combined using AND rather than OR operators. This approach may have excluded studies evaluating only one or two postoperative outcomes and should be considered when interpreting the completeness of the evidence base.

An important limitation of the available evidence concerns blinding. Nine of ten included trials used a no-intervention control rather than sham taping, making it impossible to blind participants to their treatment allocation. For subjective outcomes such as VAS pain, this introduces a high risk of performance bias (participants in the KT group may report less pain simply because they know they are receiving an active treatment) and detection bias (unblinded assessors may record more favorable outcomes in the KT group). The only trial to include a placebo arm—Tatli et al. [22]—still demonstrated significant reductions in pain and swelling with KT compared with sham taping, which provides some reassurance. However, this single study is insufficient to rule out placebo effects as a driver of the pooled pain estimates. Future trials should incorporate sham taping controls and blinded outcome assessment as standard.

A further limitation concerns the risk of publication bias. The search was restricted to English-language articles in indexed databases, and all included studies reported positive effects of KT. It is therefore possible that studies reporting null or negative results for KT remain unpublished or were not identified, which may have inflated the observed pooled effects. The uniformly positive direction of results across all included studies is consistent with this concern. Formal assessment of publication bias through funnel plots or statistical tests (e.g., Egger's test) was not performed, as fewer than ten studies contributed to any single pooled analysis, which is insufficient for reliable detection of small-study effects.

Finally, although no major adverse reactions were reported, it should be noted that using KT on the facial region, while uncommon, carries a potential risk of allergic reaction, particularly in individuals with sensitive skin.

5. Conclusions

The postoperative application of Kinesio Tape (KT) following the surgical extraction of impacted lower third molars may provide clinically relevant benefits. Consistently, the analyzed studies reported a significant reduction in pain and trismus, and a reduction in facial swelling in the early postoperative period in patients treated with KT compared with control groups, though this finding should be interpreted with caution given the methodological heterogeneity in measurement methods. A faster functional recovery and a lower need for analgesics were observed, suggesting a positive impact on patients' quality of life. However, these findings should be interpreted with caution, as nine of ten included trials used no-intervention controls rather than sham taping, making it impossible to separate the specific effect of KT from a potential placebo effect. The certainty of evidence was rated as very low (GRADE) across all primary outcomes. From a safety perspective, KT was generally well tolerated, with very few adverse effects reported. Although the likelihood of an allergic reaction is low, this possibility cannot be completely ruled out, especially in patients with sensitive skin or a history of cutaneous hypersensitivity. The available evidence supports the use of KT as a complementary, non-invasive, and accessible strategy for managing postoperative pain and inflammation after lower third-molar surgery. However, further studies with larger sample sizes, standardized protocols, and long-term follow-up are needed to confirm these findings and establish clear guidelines for its clinical application.

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Abbreviations

The following abbreviations are used in this manuscript:

KT	Kinesio Taping
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
RCTs	Randomized clinical trials
PICO	Acronym for Patient, Intervention, Comparison and Outcome
RoB	Risk of Bias

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