

# Scoping review of systematic review abstracts about temporomandibular disorders: Comparison of search years 2004 and 2017

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**Introduction:** The purposes of this study were to determine how many systematic reviews and meta-analyses relating to temporomandibular disorders (TMDs) had been published as of 2017 compared with those published as of 2004 and then to summarize the findings, based on an analysis of the abstracts from those studies.

**Methods:** A PubMed search was initiated on May 1, 2017. There were 2 separate searches. The first search was for the topic, “temporomandibular disorders.” The second search was for “temporomandibular disorders and published in the Cochrane database.” The number and the topic category of reviews for 2017 were compared with those published as of 2004.

**Results:** There were 120 relevant TMD systematic reviews found in search year 2017: 110 from the PubMed and 10 from the Cochrane searches. By comparison, there were only 8 TMD systematic reviews published in 2004. The abstracts for all 120 reviews indicated increased roles of genetics and psychosocial factors in the etiology of TMD. The future of TMD diagnoses appears to be toward various psychosocial and cellular tests, along with brain neuroimaging. The reviews on the topic of “treatment” supported conservative, noninvasive, reversible therapies, with a trend toward more targeted individual strategies. **Conclusions:** There were only 8 TMD systematic reviews published in 2004 compared with 110 in 2017. Overall, the trend has been in the direction of better diagnostic procedures, more scientific concepts of etiology, and more conservative treatments for TMD. (Am J Orthod Dentofacial Orthop 2018;154:35-46)

Once considered a single disorder with a single cause, temporomandibular disorders (TMDs) are now considered a collection of musculoskeletal conditions involving the masticatory muscles, temporomandibular joints (TMJs), and associated structures.<sup>1,2</sup> According to the American Dental Association’s first TMD conference, held in June 1982, there are 6 subclasses of TMD: masticatory muscle disorders, derangements of the TMJs, traumatic arthritis, degenerative joint diseases, chronic mandibular hypomobility, and growth disorders.<sup>1</sup> There is a multifactorial etiology for each subclass.<sup>1,2</sup> Occlusion and specific locations of the condyles in the glenoid fossae

(eg, centric relation) are no longer considered to be the primary factors in the multifactorial etiology of TMD.<sup>2-7</sup>

For many years, orthodontists have had serious interests and concerns about TMDs. In 1988, Greene<sup>3</sup> asked, “Does orthodontic treatment cause, cure, or prevent TMDs?” His answer to all 3 parts of the question was “no,” based on the limited research available at that time. Since then, there has been a tremendous increase in interest in this issue in the orthodontic specialty and the entire dental profession. The huge number of clinical and scientific studies reported in the past 30 years on TMJ topics has led to many systematic reviews and meta-analyses of that literature. In the end, the current literature has supported<sup>4-7</sup> the 1988 conclusions of Greene; orthodontics does not generally cause, mitigate, or cure TMD, nor does it prevent the future development of TMD.<sup>7</sup>

Discussions about the etiology and treatment of TMDs have moved away from a historic, dental-based model to a biopsychosocial model that integrates the host of biologic, behavioral, and social factors that are related to the onset, maintenance, and management of

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TMD.<sup>8-10</sup> Many studies have led to the conclusion that TMD treatments should be, at least initially, conservative (noninvasive), reversible, palliative, and when possible based on science and evidence.<sup>2,3,5,8,9</sup> A medical orthopedic approach is recommended that focuses on the biomedical sciences and musculoskeletal therapies similar to those for most chronic pain.<sup>9</sup> Cognitive-behavioral therapies and biofeedback are now prominent among contemporary TMD treatment modalities.<sup>8-10</sup> Genetics (vulnerabilities related to pain), cell studies, endocrinology, behavioral risk-conferring factors, and brain neuroimaging are the exciting future of TMD studies.<sup>8-10</sup>

Systematic reviews (and meta-analyses) are at the highest level in the hierarchy of scientific evidence. Systematic reviews involve an exhaustive search of the literature on a topic, and then an expert panel selects a limited number of worthy studies, mostly randomized controlled trials (RCTs), to be included in the review.<sup>11</sup> Depending on the nature of the review, RCTs may not be included. The relevant information from the chosen studies is then interpreted and summarized.<sup>11</sup> The Cochrane database of systematic reviews takes a more discriminatory approach; authors submit proposals that are reviewed by its editorial team, with systematic reviews updated at least every 4 years.

It would be of interest for dentists, including orthodontists, to know and understand the information in TMD systematic reviews to make objective, evidence-based decisions regarding patient diagnoses and treatments. In 2006, Rinchuse and McMinn<sup>12</sup> published a report in which they listed, reviewed, and discussed the 8 TMD systematic reviews (1 was a meta-analysis) published in 2004. The purpose of this current investigation was to obtain the listings and abstracts of all the TMD systematic reviews published up to 2017 and then to present this information in 6 tables arranged by topic heading: prevalence, diagnosis, etiology, treatment, surgery, and miscellaneous (Appendix Tables I-VI). The numeric data from the 2017 search was compared with those from 2004.

## MATERIAL AND METHODS

Two PubMed searches were initiated on May 1, 2017, to look for systematic reviews and meta-analyses related to TMD. The first search was for the topic, “temporomandibular disorders.” The second search was for “temporomandibular disorders and published in the Cochrane database.” The number of reviews and categories of the topics covered in those reviews were compared with the 8 TMD systematic reviews published in 2004. For the purpose of this study, only the abstracts of the

systematic reviews were obtained and analyzed to create the tables of results presented in this article.

The inclusion criteria were all systematic reviews (meta-analyses) listed in the PubMed and Cochrane databases for a search on May 1, 2017, under the title of “temporomandibular disorders.” The exclusion criterion for the general PubMed search was articles that were not TMD systematic reviews or had missing information; for the Cochrane database, the exclusion criterion was any articles that were withdrawn because they were supplanted by an updated review on a certain TMD topic.

The salient information from the systematic reviews for both searches was placed into 6 categories: prevalence, diagnosis, etiology, treatment, surgery, and miscellaneous. From the abstracts, tables were constructed for each category; the most notable information from each abstract, such as author and year, topic, number of articles meeting the selection criteria, quality of the review, and findings and conclusions are included in the 6 Appendix Tables. A table was also constructed comparing the numbers and categories of TMD systematic reviews from the 2004 search with those from the 2017 search (Table 1). In addition, for the 2017 search, PubMed listings were compared with Cochrane listings (Table 1). Results were summarized per numeric comparison, as well as per narrative, informational findings. The quality of the systematic reviews was evaluated and reported. The criteria and protocol for the assessment of the quality of the studies were based on what their authors stated, as well as the subjective opinions (when possible to ascertain from only reading an abstract) of the authors.

## RESULTS

For the first PubMed search, there were 115 listings for TMDs; 110 were relevant. For the second search in the Cochrane database, there were 19 listings; 10 were relevant; the other 9 had been withdrawn because the listings were replaced by more current reviews. The 5 articles excluded from the general PubMed listing had various deficiencies: (1) older review with no author identification, (2) article dealing with pain that was not a systematic review, (3) article on exercise and TMD with not all information reported (ie, only reported title and author), (4) article that was a critique of a publication by a world-renowned TMD expert who summarized the American Association of Dental Research 2010 Policy Statement on TMD and was not a systematic review, and (5) review that did not explicitly deal with TMD.

We divided the reviews into 6 categories: diagnosis, etiology, prevalence, treatment, surgery, and miscellaneous.

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