

COVER STORY

Prevalence of clinical signs of intra-articular temporomandibular disorders in children and adolescents

A systematic review and meta-analysis

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Temporomandibular disorders (TMDs) can be defined as a variety of clinical conditions affecting the masticatory muscles, the temporomandibular joint (TMJ), and associated structures.¹ Muscles and TMJ pain, muscle sensitivity through palpation, restricted mouth opening, asymmetric mandibular movements, and joint sounds are among the main signs and symptoms of TMD.² The etiology of TMD may be related to parafunctional habits, trauma, genetics, or anatomic problems, and may be triggered by psychosocial factors.³



The prevalence of TMD usually is expressed in percentages of people who have signs and symptoms of TMD or who have a TMJ condition that registers on an anamnestic or clinical dysfunction index.⁴ The prevalence of TMD varies widely, likely owing to methodological differences among studies, such as lack of standardization related to TMD diagnosis or related to participant selection from clinical practices and not from the general population.⁵

This article has an accompanying online continuing education activity available at: <http://jada.ada.org/ce/home>.

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ABSTRACT

Background. The aim of this systematic review and meta-analysis was to assess the prevalence of clinical signs of temporomandibular joint (TMJ) disorders in children and adolescents.

Type of Studies Reviewed. The authors selected only studies in which the investigators' primary objective was to evaluate the prevalence of signs of TMJ disorders according to the international Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) in children and adolescents. The authors performed electronic searches without language restriction in 5 databases. The authors also assessed quality.

Results. In this review and meta-analysis, the authors included 11 articles that described studies in which 17,051 participants had been enrolled. The overall prevalence of clinical signs of intra-articular joint disorders was 16% (95% confidence interval [CI], 11.59-19.94; n = 17,051). The prevalence of TMJ sounds (click and crepitation) was 14% (95% CI, 9.67-19.79; n = 11,316). The most prevalent sign was clicking (10.0%; 95% CI, 7.97-12.28; n = 9,665) followed by jaw locking (2.3%; 95% CI, 0.56-5.22; n = 5,735).

Conclusions and Practical Implications. One in 6 children and adolescents have clinical signs of TMJ disorders. The results of this systematic research study can alert dentists about the importance of looking for signs of TMD in children and adolescents.

Key Words. Evidence-based dentistry; prevalence; children; adolescents; temporomandibular joint disorders.

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The investigators of a study in children with primary dentition reported a prevalence of 34.0% of TMD signs, symptoms, or both.⁶ Furthermore, among studies related to TMJ disorders in children and adolescents, investigators reported the prevalence of clicking as 2.7% in the primary dentition, 10.1% in late mixed dentition, and 16.6% in permanent dentition.⁷ The most frequent clinical signs found in children and adolescents are TMJ sounds (perceived on palpation), limitation of mandibular movements, masticatory muscle pain, and TMJ tenderness.⁸



Supplemental material is available online.

In 2013, the investigators of a systematic review of the prevalence of TMD signs and symptoms in children reported a prevalence varying from 16.0% to 68.0%.⁹ However, the authors of this review reported only the prevalence of masticatory muscle signs and symptoms and did not look for TMJ intra-articular disorders. TMJ disorders are internal derangements defined as mechanical failures related to a malposition of the articular disk associated with interferences in normal mandibular movements.¹⁰ This topic is especially important to clinicians who are in the process of clinical decision-making for patients in pediatric populations. Notwithstanding that, to our knowledge, no summary data are available, and the reported prevalence rates published in textbooks have been made on the basis of findings from a few large-scale epidemiologic research studies.

Dentists should try to identify these signs and screen children and adolescents with intra-articular TMD so that proper clinical follow-up can be provided. We determined that, on the basis of our review of this background information, we would conduct a systematic review with the aim of reporting the prevalence of clinical signs of TMD in children and adolescents.

METHODS

Protocol and registration. This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklist.¹¹ We registered the systematic review with PROSPERO: International Prospective Register of Systematic Reviews (Centre for Reviews and Dissemination, University of York, Heslington, York, United Kingdom; and the National Institute for Health Research, London, United Kingdom) under registration number CRD42015016100.

Eligibility criteria. Inclusion criteria. We determined that the only articles that were eligible for the study were those for whom the authors had investigated the prevalence of clinical signs of TMJ disorders in children and adolescents (aged 0-18 years). We included studies whose authors evaluated TMJ signs according to the Research Diagnostic Criteria for Temporomandibular Disorders¹⁰ (RDC/TMD) established by the

International RDC/TMD Consortium Network of the International Association for Dental Research and the Orofacial Pain Special Interest Group¹⁰ or by using similar criteria even if they had not referenced the criteria as being RDC/TMD. We considered for inclusion studies whose authors evaluated the following signs: TMJ noise (for example, click, pop, snap, or crepitus), jaw locking or catching, or both. Also, we considered for inclusion only studies whose reports included a dentist's clinical examination, as well as an evaluation of TMJ sounds conducted without the aid of a stethoscope and through the study participant's repeated movements (at least 3 times) of mouth opening. We did not apply any language restrictions.

Exclusion criteria. We excluded studies according to the following criteria: reviews, letters, conference abstracts, and expert opinions; studies in which members of the sample had craniofacial anomalies, genetic syndromes, or neuromuscular diseases; studies with participants who were undergoing active orthodontic treatment or participants whose conditions indicated a need for orthognathic surgery; studies in which the investigators had not conducted the face-to-face interviews (for example, investigators conducted interviews by phone or mail); studies whose participants were adults (≥ 19 years old); studies whose authors investigated only muscular symptoms; studies in which a dentist did not conduct the interview, the examination, or both; studies whose authors did not perform the same protocol as that described by RDC/TMD; studies whose authors used convenience samples extracted from patients in treatment in dental clinics or hospital; and studies whose authors used samples of fewer than 300 participants.

Information sources. With the help of a health sciences librarian (M.G.S.), we selected appropriate truncation and word combinations and adapted them for each database search. We developed detailed, individualized strategies for each of the following bibliographic databases: the Cochrane Library, MEDLINE, Embase, PubMed, and LILACS. (More information on the search strategies is provided in eTable 1, available online at the end of this article.) We undertook a partial gray literature search through Google Scholar. We also hand searched the reference lists cited in the included articles for any additional references that might not have been identified during the electronic database searches.

Search. We managed the references and removed the duplicates by using appropriate software (RefWorks-COS, ProQuest). We conducted all the electronic

ABBREVIATION KEY. DC/TMD: Diagnostic Criteria for Temporomandibular Disorders. JIA: Juvenile idiopathic arthritis. RDC/TMD: Research Diagnostic Criteria for Temporomandibular Disorders. TMD: Temporomandibular disorders. TMJ: Temporomandibular joint.

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