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Lígia Figueiredo Valesan

PREVALÊNCIA DE DISFUNÇÃO TEMPOROMANDIBULAR ARTICULAR:
UMA REVISÃO SISTEMÁTICA E META-ANÁLISE

Florianópolis
2020

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Orientadora: Profª. Beatriz Dulcineia Mendes de Souza, Drª.

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Lígia Figueiredo Valesan

PREVALÊNCIA DE DISFUNÇÃO TEMPOROMANDIBULAR ARTICULAR:
UMA REVISÃO SISTEMÁTICA E META-ANÁLISE

O presente trabalho em nível de mestrado foi avaliado e aprovado por banca examinadora composta pelos seguintes membros:

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Universidade Federal de Santa Catarina

Certificamos que esta é a **versão original e final** do trabalho de conclusão que foi julgado adequado para obtenção do título de Mestre em Clínicas Odontológicas pelo Programa de Pós-Graduação em Odontologia da Universidade Federal de Santa Catarina.

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Profª. Beatriz Dulcineia Mendes de Souza, Drª.
Orientadora

Florianópolis, 2020.

Dedico esta dissertação às pessoas mais importantes da minha vida, meus pais, Édina e Lair.

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“Quando a situação for boa, desfrute-a. Quando a situação for ruim, transforme-a. Quando a situação não puder ser transformada, transforme-se.” (FRANKL V.)

APRESENTAÇÃO

Esta dissertação foi originalmente escrita como um artigo na língua inglesa, intitulado *"Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis"* e foi submetido na revista *Clinical Oral Investigation*. Essa pesquisa foi realizada em parceria com as pesquisadoras Cecília Doebber Da-Cas, MSc. Jéssica Conti Réus, Ana Cristina Scremin Denardin e Drª. Beatriz Dulcineia Mendes de Souza, da Universidade Federal de Santa Catarina (UFSC); bem como, o pesquisador MSc. Roberto Garanhani da Universidade do Sul de Santa Catarina (UNISUL); o pesquisador Dr. Daniel Bonotto, da Universidade Federal do Paraná (UFPR); e o pesquisador Dr. Eduardo Januzzi, coordenador do Centro de Dor Orofacial do Hospital Mater Dei, em Belo Horizonte.

RESUMO

Objetivo: Avaliar por meio de uma revisão sistemática e meta-análise a prevalência de disfunção temporomandibular (DTM) articular na população em geral. **Métodos:** As cinco principais bases de dados da saúde e três da literatura cinzenta foram pesquisadas para identificar os estudos primários, observacionais, em que a DTM articular tenha sido diagnosticada por meio dos Critérios de Diagnóstico para Pesquisa em Disfunção Temporomandibular (RDC/DTM) ou os Critérios Diagnósticos (DC/DTM). Os estudos foram selecionados cegamente por dois revisores com base em critérios de elegibilidade pré-definidos. O risco de viés (RoB) foi avaliado por meio do checklist da Joanna Briggs Institute Critical Appraisal Checklist e o software MedCalc foi utilizado para realizar as meta-análises. **Resultados:** De 2.741 artigos, 16 preencheram os critérios de elegibilidade e foram incluídos para a análise qualitativa e quantitativa. Nove estudos foram julgados com baixo RoB, cinco com moderado e dois com alto. As DTMs encontradas nos estudos primários foram: artralgia, deslocamento de disco (DD) com redução (DDcR), DDcR com travamento intermitente, DD sem redução (DDsR) com abertura limitada, DDsR sem abertura limitada, doença articular degenerativa (DAD), osteoartrite, osteoartrose e subluxação. Os principais resultados das meta-análises gerais de prevalência, para adultos/idosos foram: DTM articular (37,6%); artralgia (10,1%) e DAD (9,1%). Além disso, para crianças/adolescentes foram: DTM articular (12,6%); artralgia (2,9%) e DAD (0,9%). Considerando as meta-análises de diagnóstico individual, a DTM articular mais prevalente foi o DDcR, sendo que a prevalência, para adultos/idosos foi 33% e, para crianças/adolescentes foi 9,3%. **Conclusão:** A prevalência geral de DTM articular foi de aproximadamente 38% para adultos/idosos e de 13% para crianças/adolescentes. Além disso, a DTM articular mais prevalente foi o DDcR.

Palavras-chave: Transtornos da articulação temporomandibular. Revisão sistemática. Metanálise. Estudos de prevalência.

ABSTRACT

Objective: Evaluate the prevalence of temporomandibular joint disorders (TMJD) among the general population. **Methods:** Five main electronic databases and three grey literature were searched to identify observational studies in which TMJD was diagnosed using the Research Diagnostic Criteria (RDC/TMD) or Diagnostic Criteria (DC/TMD). The studies were blindly selected by two reviewers based on eligibility criteria. Risk of bias (RoB) was assessed using the Joanna Briggs Institute Critical Appraisal Checklist and the MedCalc software was used to perform meta-analyses. **Results:** From 2741 articles, 16 articles were included for the qualitative and quantitative analysis. Nine studies were judged at low RoB, five at moderate, and two at high. The TMJD investigated were: arthralgia, disk displacement with reduction (DDwR), DDwR with intermittent locking, DD without reduction (DDwoR) with limited opening, DDwoR without limited opening, degenerative joint disease (DJD), osteoarthritis, osteoarthrosis and subluxation. The main results from prevalence overall meta-analyses for adults/elderly: TMJD (37.6%); arthralgia (10.1%) and DJD (9.1%). Furthermore, for children/adolescents: TMJD (12.6%); arthralgia (2.9%) and DJD (0.9%). Considering the individual diagnosis meta-analyses, the most prevalent TMJD is DDwR for adults/elderly (33%) and children/adolescents (9.3%). **Conclusion:** The overall prevalence of TMJD was approximately 38% for adults/elderly and 13% for children/adolescents and the most prevalent TMJD was DDwR.

Keywords: Temporomandibular joint disorder. Systematic review. Meta-analysis. Prevalence.

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LISTA DE ABREVIATURAS E SIGLAS

ATM - Articulação Temporomandibular
DAD - Doença Articular Degenerativa
DC/DTM - Critérios Diagnósticos em Disfunção Temporomandibular
DD - Deslocamento de Disco
DTM - Disfunção Temporomandibular
RDC/DTM - Critérios de Diagnóstico para Pesquisa em Disfunção Temporomandibular

Do artigo em inglês:
CI - Confidence interval
DC/TMD - Disorders Diagnostic Criteria for Temporomandibular Disorders
DD - Disc displacement
DDwoR - Disc displacement without reduction
DDwR - Disc displacement with reduction
DJD - Degenerative joint disease
ICOP - International Classification of Orofacial Pain
LILACS - Latin American and Caribbean Health Sciences
MA - Meta-analysis
MRI - Magnetic resonance imaging
N - No
PRISMA - Preferred reporting items for systematic review and meta-analysis protocols
PROSPERO - Prospective Register of Systematic Reviews
RDC/TMD - Research Diagnostic Criteria for Temporomandibular
RoB - Risk of bias
TMD - Temporomandibular disorders
TMJ - Temporomandibular joint
TMJD - Temporomandibular joint disorder
Y - Yes

LISTA DE SÍMBOLOS

% - Percentual

± - Mais ou menos

SUMÁRIO

1 INTRODUÇÃO

As disfunções temporomandibulares (DTMs) representam um significativo problema de saúde pública, afetando aproximadamente 5% a 12% da população em geral (NATIONAL INSTITUTE OF DENTAL AND CRANIOFACIAL RESEARCH, 2018). São consideradas as causas mais comuns de dor crônica na região orofacial de origem não dental (LIST E JENSEN, 2017). Anualmente, o custo do manejo das DTMs dolorosas, nos Estados Unidos, é de quatro bilhões de dólares, sem considerar os exames de imagem (NATIONAL INSTITUTE OF DENTAL AND CRANIOFACIAL RESEARCH, 2018).

A Academia Americana de Dor Orofacial define as DTMs como sendo um termo “guarda-chuva”, que abrange um conjunto de condições musculoesqueléticas e neuromusculares que envolvem os músculos mastigatórios, a articulação temporomandibular (ATM) e/ou suas estruturas associadas (DE LEEUW E KLASSER, 2013).

As disfunções podem ser classificadas em dois grupos: as de origem articular, sendo aquelas cujos sinais e sintomas estão relacionados à ATM. Bem como, as de origem muscular, cujos sinais e sintomas estão relacionados à musculatura estomatognática (BENDER, 2012). Em especial, as DTMs de origem articular são definidas como um tipo de distúrbio interno da articulação, que envolvem falhas mecânicas relacionadas a uma posição incorreta do disco articular, acompanhadas, em determinados casos, de movimentos mandibulares descoordenados, sintomas otológicos e dores articulares (SCHIFFMAN et al., 2014).

As ferramentas de classificação aceitas mundialmente, para o diagnóstico das DTMs são: Critério Diagnóstico para Pesquisa em Disfunção Temporomandibular (RDC/DTM), o Critério Diagnóstico em Disfunção Temporomandibular (DC/DTM), e mais recentemente, a Classificação Internacional de Dor Orofacial (ICOP), que tem o intuito de aumentar a conformidade entre os estudos, permitindo uma padronização e reprodução dos resultados, tanto no meio clínico quanto em pesquisas (DWORKIN E LERESCHE, 1992; SCHIFFMAN et al., 2014; ICOP, 2020). Ainda, de acordo com o DC/DTM, os tipos mais comuns de DTM

articular incluem, a artralgia, o deslocamento de disco, a doença articular degenerativa e a subluxação.

No entanto, a prevalência real de DTM é uma questão de debate, devido à falta de homogeneidade nos critérios diagnósticos adotados nas investigações correlacionadas. Estudos anteriores avaliaram a prevalência de distúrbios na ATM, tanto na população em geral, quanto na população com DTM. No entanto, até o momento, nenhuma revisão sistemática foi realizada avaliando a prevalência de DTM articular, com base nos dois critérios diagnósticos disponíveis, RDC/DTM e DC/DTM. Portanto, a presente revisão sistemática foi realizada para responder à seguinte pergunta de pesquisa: "Qual a prevalência de disfunção temporomandibular articular na população em geral?"

2 JUSTIFICATIVA

Em 2011, uma revisão sistemática avaliou a prevalência de DTM articular e muscular na população em geral e em pacientes com sintomas de DTM. Porém, os autores utilizaram como critério diagnóstico apenas o RDC/DTM. Além disso, ao longo desses nove anos, muitos artigos primários foram publicados acerca da temática, e novos critérios diagnósticos foram publicados, como o DC/DTM. O estudo conclui que seja feita uma nova revisão sistemática utilizando critérios diagnósticos atualizados e revisados, tendo em vista que, segundo os próprios autores, foi observada uma grande variabilidade de achados, principalmente em relação aos distúrbios articulares (MANFREDINI et al., 2011).

3 OBJETIVOS

3.1 Objetivo Geral

Revisar sistematicamente e analisar criticamente a prevalência de disfunção temporomandibular articular na população em geral.

3.2 Objetivos Específicos

- Realizar uma busca sistemática da literatura e, com base em critérios de elegibilidade pré-definidos, selecionar os estudos com maior nível de evidência disponível;

- Avaliar o risco de viés dos estudos incluídos;

- Obter as prevalências de acordo com cada critério diagnóstico (RDC/DTM e DC/DTM);

- Determinar qual o tipo de DTM articular mais frequente na população em geral;

- Realizar uma análise crítica sobre as evidências atuais em relação às DTMs articulares.

4 ARTIGO

Artigo formatado conforme as normas da revista *Clinical Oral Investigation*.

Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis

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Abstract

Objective: Evaluate the prevalence of temporomandibular joint disorders (TMJD) among the general population. **Methods:** Five main electronic databases and three grey literature were searched to identify observational studies in which TMJD was diagnosed using the Research Diagnostic Criteria (RDC/TMD) or Diagnostic Criteria (DC/TMD). The studies were blindly selected by two reviewers based on eligibility criteria. Risk of bias (RoB) was assessed using the Joanna Briggs Institute Critical Appraisal Checklist and the MedCalc software was used to perform meta-analyses. **Results:** From 2741 articles, 16 articles were included for the qualitative and quantitative analysis. Nine studies were judged at low RoB, five at moderate, and two at high. The TMJD investigated were: arthralgia, disk displacement with reduction (DDwR), DDwR with intermittent locking, DD without reduction (DDwoR) with limited opening, DDwoR without limited opening, degenerative joint disease (DJD), osteoarthritis, osteoarthrosis and subluxation. The main results from prevalence overall meta-analyses for adults/elderly: TMJD (37.6%); arthralgia (10.1%) and DJD (9.1%). Furthermore, for children/adolescents: TMJD (12.6%); arthralgia (2.9%) and DJD (0.9%). Considering the individual diagnosis meta-analyses, the most prevalent TMJD is DDwR for adults/elderly (33%) and children/adolescents (9.3%). **Conclusion:** The overall prevalence of TMJD was approximately 38% for adults/elderly and 13% for children/adolescents and the most prevalent TMJD was DDwR.

Keywords: Temporomandibular joint disorder. Systematic review. Meta-analysis. Prevalence.

INTRODUCTION

The American Academy of Orofacial Pain defines TMDs as an umbrella term, which covers a set of musculoskeletal and neuromuscular conditions involving the masticatory musculature, the temporomandibular joint (TMJ) and/or their associated structures [1]. Temporomandibular disorders (TMD) are a significant public health problem affecting approximately 5% to 12% of the overall population [2] being considered the most common cause of chronic pain of nondental origin in the orofacial area [3].

The disorders can be classified in two subgroups: those of articular origin, in which the signs and symptoms are related to TMJ, and those of muscular origin, when the signs and symptoms are related to the stomatognathic musculature [4]. In particular, TMDs of articular origin embraces several alterations affecting the hard and the soft tissues of the TMJ. Among the most common temporomandibular joint disorder (TMJD) there are: disc disorders, joint pain, joint disorders and degenerative joint disease [1, 5].

The worldwide accepted classification tools for the diagnosis of TMDs are Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) and Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) [5, 6]. Recently, an International Classification of Orofacial Pain (ICOP) was developed, which aims to increase compliance among studies, allowing the standardization and reproduction of results, both clinically and in research [7].

Previous studies have evaluated the prevalence of TMDs among the general population, however, to date, no systematic review has been performed evaluating the two available diagnostic criteria, RDC/TMD and DC/TMD, among the general population. Therefore, the present systematic review has been performed to answer the following focused question: "What is the prevalence of temporomandibular joint disorders among the general population?"

METHODS

Protocol and registration

This systematic review was elaborated according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklist (PRISMA) [8]. The

protocol was performed according to PRISMA-P [9] and enrolled in the International Prospective Register of Systematic Reviews (PROSPERO, Centre for Reviews and Dissemination, University of York; and the National Institute for Health Research) [10] under the registry number CRD42020151507.

Eligibility criteria

Inclusion criteria consisted of cross-sectional studies that evaluated the prevalence of TMJD among general population. Also, TMJD should be assessed through RDC/TMD [6] or DC/TMD [5]. No restrictions regarding participant's age, sex and language of publication was applied. Painful and non-painful TMD were accepted. The types of TMJD considered in this study were Arthralgia, Disc displacement (DD) and Degenerative joint disease (DJD). Concerning the sample collection site: samples from general population (children, adolescents, adults and elderly), from basic health units and schools were considered.

The exclusion criteria encompassed the following: 1) Studies that did not use RDC/TMD (studies published before 1992) or DC/TMD; 2) Studies with duplicated data from another included study; 3) Studies focused on the following patients: with full prosthesis, orthodontic treatment, athletes, pregnant, obese, musician, postmenopausal women and full or partial edentulous; 4) Studies focused on samples of patients with comorbidities (fibromyalgia, systemic joint hypermobility, juvenile idiopathic arthritis, systemic osteoarthritis, trigeminal neuralgia, burning mouth syndrome, atypical facial pain, migraine, atypical odontalgia, cervical pain, neuropathic pain and dentoskeletal deformities) or fractures and congenital/developmental disorders (aplasia, hypoplasia, hyperplasia) or any other syndrome associated to TMJD; 5) Studies reporting only annual incidences of TMD; 6) Studies that did not investigate TMJD or did not provide separate data of them; 7) Studies with a convenience sample, that is, individuals recruited from orofacial pain centers or samples in which patients already had a previous diagnosis of TMJD; 8) Studies that report only the signs and symptoms of TMJD; 9) Reviews, letters, books, conference abstract, expert opinion, case reports, technique articles, posters, guidelines, pilot studies; 10) Full-text not available.

Information sources and search

An electronic search strategy was developed for PubMed and adapted for each of the following bibliographic databases: EMBASE, Latin American and Caribbean Health Sciences (LILACS), Scopus, and Web of Science. A partial grey literature search was also performed on Google Scholar, Open Grey, and ProQuest. The Google Scholar search was limited to the first 100 most relevant articles published in the last 10 years. The search strategy was coordinated by an experienced librarian. All searches were conducted from the starting coverage date through January 22, 2020. Moreover, the list of references of included studies was hand-searched to identify additional relevant studies. The expert authors of this review were consulted by email in order to refine search findings. A reference manager (EndNote X7®, Thomson Reuters, Philadelphia, PA) was used to collect references and remove duplicates. More information on the search strategies is provided in Online resource 1.

Study selection

In phase 1, two authors (LFV and CDD) blindly assessed titles and abstracts of identified studies, applying eligibility criteria using a software (Rayyan®, Qatar Computing Research Institute). If papers were considered eligible for inclusion, a full-text reading was blindly performed by the same reviewers (phase-2). Disagreements were discussed with third reviewer (JCR) and resolved in a consensus meeting.

Data collection process and data items

The data collection process was performed by the first author (LFV) and cross-checked by the second author (CDD) to ensure integrity of contents. Any disagreements were discussed with third reviewer (JCR). The following data were extracted for each included study: descriptive study characteristics (author, year and country), population characteristics (sample size, sex distribution, mean age) were registered, and the prevalence according the type of TMJD for RDC/TMD and DC/TMD.

Risk of bias in individual studies

The risk of bias (RoB) was assessed by two blinded reviewers (LFV and CDD) using the Joanna Briggs Institute Critical Appraisal Checklist for Prevalence Studies [11] and information was crosschecked in a consensus meeting. In case of disagreements, a third author was consulted (JCR). The answers could be "yes", "unclear", "no", or "not applicable". Decisions about scoring were agreed upon by all reviewers before critical appraisal commences and studies were characterized according to the following: Studies that reached up to 49% of questions scored as “yes” were classified as “high RoB”; from 50 to 69% as “moderate RoB”; and more than 70% as “low RoB”. Figures were generated using a software (RevMan 5.3, The Nordic Cochrane Centre, Copenhagen, Denmark).

Summary measures and synthesis of results

The prevalence of TMJD was expressed by means of relative or absolute frequencies and its 95% confidence intervals (95%CI). A meta-analysis was performed to assess the overall pooled prevalence of TMJD. Furthermore, additional meta-analyses were conducted to assess the pooled prevalence of TMJD considering individually diagnosis.

The I^2 test was used to evaluate statistical heterogeneity and a value higher than 50% was considered as an indicator of variation in true effects not attributable to sampling error [12]. In addition, since a distribution of true effect sizes is expected across included studies due to different sample characteristics and study methods, the random effect model was applied in all meta-analyses [13]. All statistical analyses were carried out using the MedCalc Statistical Software version 14.8.1 (MedCalc Software, Ostend, Belgium).

Risk of bias across studies

The heterogeneity across studies was assessed by comparing variability among sample characteristics (such as age and type of TMJD). Methodological and statistical heterogeneity were evaluated by comparing the variability in study design and the risk of bias in individual studies.

RESULTS

Study selection

Following a systematic literature search, a total of 3769 articles were found in main electronic databases and 452 studies were selected from grey literature and reference list. After duplicates had been removed, 2741 records remained for title and abstracts screening (phase-1). Subsequently, 145 studies were considered eligible to be fully assessed. After full-text reading (phase-2), 129 studies were excluded (Online resource 2) and 16 were finally included for qualitative and quantitative synthesis. An overview of the selection process is shown in Fig. 1.

Study characteristics

The 16 studies on general populations accounted for a total of 11,122 subjects (5,696 women, 3,864 men, 1,562 unspecified gender; female-to-male ratio 1.4) with a mean age ranging between 9 [14] and 74 [15] years. The studies were divided between RDC/TMD and DC/TMD and also between children/adolescents (aged 7 to 19 years) and adults/elderly (aged 20 to 74). The studies were conducted in 14 different countries and sample sizes regarding TMJD ranged from 154 [16] to 1643 participants [17]. A summary of the descriptive characteristics of the studies can be found in Table 1 for RDC/TMD (thirteen studies included) and Table 2 for DC/TMD (three studies included). There has been a recent ICOP publication, however, there are still no primary studies using this diagnostic tool.

RoB within and across studies

None of the included studies fulfilled all the methodological quality criteria. Most studies were judged at low risk [15, 17-24], five studies at moderate risk [14, 25-28] and two at high risk of bias [16, 29]. Further information about the risk of bias assessment can be found in Fig. 2 and detailed information about assessment of critical issues are available in Online Resource 3.

The study with the biggest sample size [17] had low risk and was conducted on patients from general population. The high RoB was assigned by a negative or unclear response to questions 4, 5, and 9 in studies. These items corresponded to subject's description, sample coverage, and confounding factor identification, respectively. The main methodological problem was concerning selection of the

reported result. Some studies did not divide the results into single diagnosis, but only in the main group or they mixed in multiple diagnoses of muscle and joint TMD, limiting some analyzes.

Results of individual studies

The prevalence of individual diagnosis was quite variable among individuals' studies. The studies that used RDC/TMD were divided into adults/elderly and children/adolescents, and obtained the following prevalence results:

- *Adults/elderly:* Arthralgia: 5.7% [17] until 35.2% [29]; Disk displacement with reduction (DDwR): 4.4% [17] until 31.8% [29]; Osteoarthritis: 1.9% [17] until 3.3% [29]; Osteoarthrosis: 5.2% [17] until 10.3% [29]. Only one study [29] investigated DD without reduction (DDwoR) without limited opening, whose prevalence was 1.1%. This same study was the only one that investigated DDwoR with limited opening, however, no case was found in the studied sample, therefore, the prevalence was 0%.
- *Children/adolescents:* Arthralgia: 0.8% [18] until 6.6% [20]; DDwR: 0.5% [18] until 21.4% [14]; DDwoR without limited opening: 0% [22, 28] until 0.3% [18]; Osteoarthritis: 0% [22] until 0.6% [28]; Osteoarthrosis: 0% [22, 28] until 3.7% [20]. Three studies [18, 22, 28] investigated the prevalence of DDwoR with limited opening, however, no case was found in the studied sample, therefore, the prevalence was 0%.

The eligible studies that adopted DC/TMD as diagnostic criteria only presented data for adults and elderly, and obtained the following prevalence values:

- *Adults/elderly:* Artralgia: 1.2% [15] until 21.1% [24]; DDwR: 20.8% [16] until 47.9% [24]; DDwoR without limited opening: 0.4% [24] until 3.3% [16]; DDwoR with limited opening: 0% [24] until 1.9% [16]; DJD: 1.3% [16] until 34.9% [17]; Only one study [24] investigated DDwR with intermittent locking and subluxation, however, no case was found in the studied sample, therefore, the prevalence was 0%.

Studies in patients with TMD considered the local condition that could affect one or both TMJ in a patient. Consequently, the studies may differ in the way they report the frequency: according to patients or according to joints.

Synthesis of results

Overall diagnoses

The heterogeneity between the studies was high on this meta-analysis because the variability among sample characteristics, methodological heterogeneity, and risk of bias in individual studies, so a random effect was considered. The overall prevalence of TMJD for adults/elderly, regardless of diagnostic criteria, was 37.6% (95%CI; 13.8 to 65.1). However, for children/adolescents there are only studies with the RDC/TMD so the overall prevalence of TMJD was 12.6% (95%CI; 7.6 to 18.5). Additional overall prevalence was calculated for adults/elderly, without consider the diagnostic criteria, and was obtained 10.1% (95%CI; 2.2 to 22.8) for arthralgia, 33.6% (95%CI; 11.2 to 60.9) for DDwR, and 9.1% (95%CI; 2.3 to 19.5) for DJD.

Nevertheless, considering the diagnostic criteria, for RDC/TMD adults/elderly, the overall meta-analysis was 37% (95%CI; 6.5% to 75.2%) and for DC/TMD was 38.9% (95%CI; 21% to 58.5%). Additional overall meta-analyses were performed with some diagnostic groups such as: DD and DJD (osteoarthritis/osteoarthrosis). The results of all meta-analyses are available in Table 3.

Individual diagnoses

Additional meta-analyses were performed for individual diagnoses, divided by diagnostic criteria and age, as presented in Table 3. The most prevalent individual diagnosis was DDwR for adult/elderly, both in the RDC/TMD (33.5%) and in the DC/TMD (33.8%), with very close rates. Likewise, DDwR was also the most prevalent diagnosis in children/adolescents assessed by the RDC/TMD (9.3%).

DISCUSSION

This systematic review investigated the prevalence of TMJD among the general population, using diagnostic criteria recognized worldwide such as RDC/TMD and DC/TMD, in order to summarize the data collected over the years for epidemiological purposes. The actual prevalence of TMD in the population level is a matter of debate, due to the lack of homogeneity in the diagnostic criteria adopted in correlated investigations.

The development of RDC/TMD in 1992 had the intention of be used only by research. Later, in 2014, the DC/TMD expanded its use to clinical scope, in order to establish a reliable, standardized and validated criteria to diagnose TMD subtypes, since one of the biggest methodological problems in correlated research is the accurate definition of the criteria applied [6, 30, 31, 32]. According to the DC/TMD, the most common types of TMJD are arthralgia, as well as disorders associated with the TMJ, such as DD (e.g., DDwR) and DJD (e.g., osteoarthritis, osteoarthrosis) [5], agreeing with the findings in our study.

Patients with TMD symptoms are present over a large age range, appearing to be quite common among children and adolescents. Yet, a higher prevalence is seen in young and middle-aged adults, with a peak of occurrence between 20 and 40 years of age [3, 33, 34], corroborating our findings that adults/elderly have a higher prevalence of TMJD (37.6%) than children/adolescents (12.6%).

According to each diagnostic criteria the prevalence of TMJD, for adults/elderly, to RDC/TMD was 37% and for DC/TMD was approximately 39%. It should be noted that the number of articles that adopted the DC/TMD [15, 16, 24] and that met the eligibility criteria were low, moreover, there has been no study in children using this criterion. The smaller number of articles that used DC/TMD may be justified due to the fact that it is a relatively new tool and has not yet been translated into many languages, as the RDC/TMD. Thus, to disseminate the use of new diagnostic criteria, such as DC/TMD and ICOP, peer-reviewed journals should encourage its use in future primary studies.

The results for overall arthralgia in this systematic review was 10.1%, a higher prevalence when compared to the 2.6% prevalence found in a systematic review in 2011 [34]. This prevalence increased, possibly, due to the fact that more studies evaluating the same condition were included moreover, this increase in prevalence was already expected and suggested in previous systematic reviews [34] due to the creation of new diagnostic criteria. Like DC/TMD, where new instruments have been added, such as the diagnostic algorithms for arthralgia, which now include criteria for modification of pain by function, movement, or parafunction [5]. Additionally, the clinical examination for arthralgia includes provocation tests of pain with any jaw movement and new sites for TMJ palpation [5].

According to the included studies, the prevalence of TMJD in adults/elderly shows that DDwR is the most prevalent subtype (33%), regardless of the diagnostic criteria, in agreement with results of previous studies [35, 36]. Nevertheless, in a previous systematic review [34], which was used only RDC/TMD, a lower prevalence was found (11.4%) due to the smaller number of articles and patients affected by the condition.

It is worth mentioning that the studies included in the present review did not use imaging exams to diagnose DD. Therefore, this prevalence may be even higher, as many patients with DDwR did not present any signs or symptoms, hence, dental surgeons should be aware of diagnosis of false negative cases [37, 38, 39]. Also, there are some changes in the diagnostic process for some categories in DC/TMD, for instance, for DD and DJD, it is now considered: any joint noise present in the last 30 days and the patient's report for the presence of any type of joint crepitus (thin or thick) [5]. These details may be one of the explanations for the increased prevalence found in some categories of this review.

For DC/TMD, the diagnosis of arthralgia, DDwoR with limited opening and subluxation, based only on clinical history and physical examination, without imaging, the sensitivity and specificity are considered good. But, for DDwR, DDwR with intermittent locking, DDwoR without limited opening and DJD, the sensitivity and specificity are bad, demanding a standard image exam [5]. Another systematic review also reported that clinical examination protocols have poor validity to diagnose DDwR and DDwoR, as compared with magnetic resonance imaging (MRI) [40]. However, an accurate diagnosis, with the aid of MRI, should be reserved for those few cases with diagnostic difficulties or when the results of imaging may influence treatment and prognosis for the patient [40]. Unfortunately, none of the three articles that used DC/TMD adopted MRI or computed tomography in their diagnoses. Thus, it is believed that the use of images increases the prevalence rate in these cases.

Regarding to pooled prevalence of TMJD considering individual diagnoses, it was observed the lowest rates for DDwoR with limited opening, regardless diagnostic criteria. In addition, in the RDC/TMD there were more categories with low prevalence in children’s and adolescents’ sessions, such as DDwoR without limited opening, osteoarthritis and osteoarthrosis. The distribution pattern of these diagnoses seems

to suggest that these disorders are more unusual than other conditions in the general population. Furthermore, the DDWoR is commonly false negative diagnosis, since this clinical sign many times has to be confirmed by imaging tests [6, 41].

No case of subluxation was found, possibly because one of the exclusion criteria was patients with systemic joint hypermobility. Another possibility is that in primary studies, a misunderstanding could have happened between the diagnosis of hypermobility and DD [42]. Patients might have difficulties to understand questions regarding the position of the luxated jaw, or closing problems, so mix-ups may occur between subluxation and opening problems with a closed mouth position. However, reported closing problems of the jaw could also be attributed to DD. In a clinical context, this problem may be solved by observing clicks due to hypermobility that can be distinguished from those due to DD by their timing during opening/closing and through imaging exams [42].

In DC/TMD, the terms osteoarthritis and osteoarthrosis no longer exist because these diagnoses were considered as subclasses of DJD [5], for this reason in summary table of the results of the meta-analyses, DJD is in the same place of the osteoarthritis and osteoarthrosis. Even so, comparatively, the prevalence in adults/elderly were very similar between DJD (8.3%) and the overall osteoarthritis and osteoarthrosis (10%). There are two previous studies [34, 43] that report the prevalence of DJD that ranged from 18.01% to 84.74% [43], and in another study it was 30.1% [34]. However, both of them only investigated the group of patients with TMD. Furthermore, cases of arthralgia are counted along with those of osteoarthritis and osteoarthrosis, which may justify this high percentage.

The most common diagnosis in children and adolescents was DDwR (9.3%), according to preliminary studies the prevalence of DDwR increases with age: the prevalence of symptomatic DD is about 6%, increasing in the population between 16 and 19 years old, until it reaches the same prevalence observed in adults [28, 44, 45].

The prevalence estimates in most of the included studies were obtained from populations of different schools, public and private, based in different locations, which were randomly selected, as well as their participants. The second place of greatest sample collection was from people registered in the health system of the city. It is

important that these data are emphasized so that the results may reflect the reality of the population in general and not only a specific group of people. Additionally, the participants were not originated from orofacial pain treatment clinics, or from any venues specialized in the treatment of people with TMJD, in order to avoid overestimating the data.

Therefore, dental surgeons must be aware of the relatively high rates of some specific types of TMJD that can affect the general population, especially in adults. Hence, when discussing this with the patients, appropriate strategies for early diagnosis and correct management should be considered, avoiding worsening of the condition and improving the prognosis and quality of life of these patients [46].

Limitations

Some limitations could be pointed out in this systematic review. It was detected statistic heterogeneity among studies. The studies differ mostly in sample characteristics and methodological heterogeneity by comparing variability in study design (differences in the measures of the outcome). In addition, it was not possible to investigate the prevalence by gender, as most studies did not categorize each diagnosis according to sex. Therefore, any conclusions about the potential role of gender as risk factor could not be drawn.

For DC/TMD, no imaging tests have been performed for certain diagnoses of TMJD and no sufficient data were available to perform the meta-analysis of the subluxation and DDwR with intermittent locking. As well as for DDwoR with opening limitation and DDwoR without opening limitation for RDC/TMD. However, it is important to mention the difficulty in research that investigates large populations, both due to the high cost, as well as the difficulty of access and also due to exposure to radiation, although minimal in exams like cone beam.

Regarding meta-analysis, two studies [15, 17] were not added to overall meta-analysis because the muscle disorders were mixed with TMJD diagnoses. Therefore, these studies were only included on the individual diagnosis meta-analysis. Besides, one study [25] was removed from the arthralgia overall and individual meta-analysis (RDC/TMD adult/elderly) because it reported the diagnosis of arthralgia and myofascial pain together, with no possibility of separating them. These limitations

should be highlighted, because the actual prevalence may have been underestimated and may act as a confounding factor, making it difficult to have a clear judgment about the general prevalence rates.

CONCLUSIONS

The overall prevalence of TMJD was, approximately, 38% on adults/elderly and on 13% for children/adolescents. Furthermore, the most prevalent TMJD is DDwR, approximately, 33% in adults/elderly and 9.3% in children/adolescents.

Compliance with ethical standards

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5 CONCLUSÃO

A prevalência geral de DTM articular foi de, aproximadamente, 38% em adultos/idosos e de 13% em crianças/adolescentes. Além disso, a DTM articular mais prevalente foi o DDcR com aproximadamente 33% em adultos/idosos e 9,3% em crianças/adolescentes.

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APÊNDICES

Figure 1 – Flowchart of the process of literature search and selection (adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analysis)

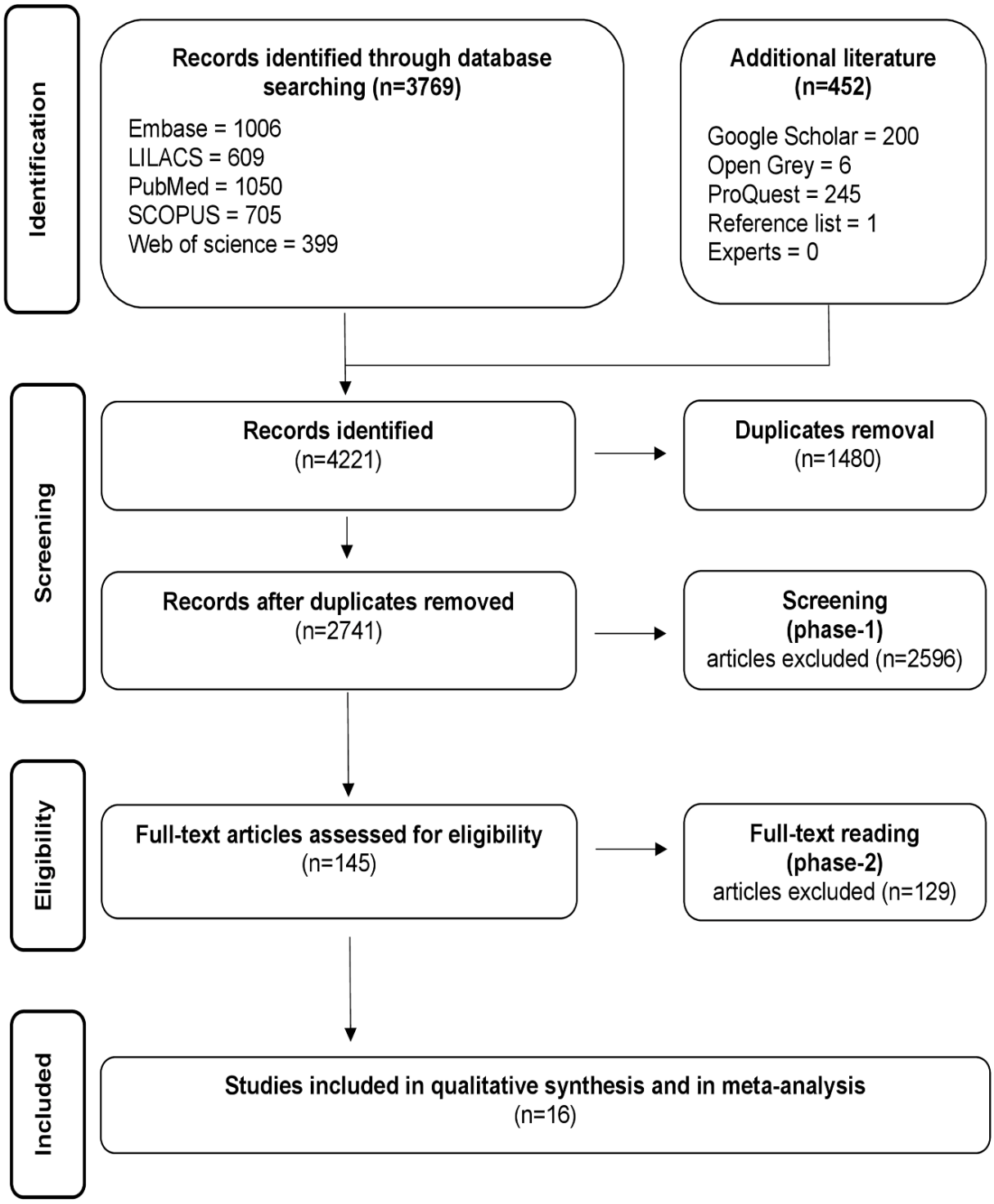

Figure 2 – Risk of bias summary, assessed by Joanna Briggs Institute Critical Appraisal Checklist for Analytical for Studies Reporting Prevalence Data (generated using the software Review Manager 5.3, The Cochrane Collaboration)

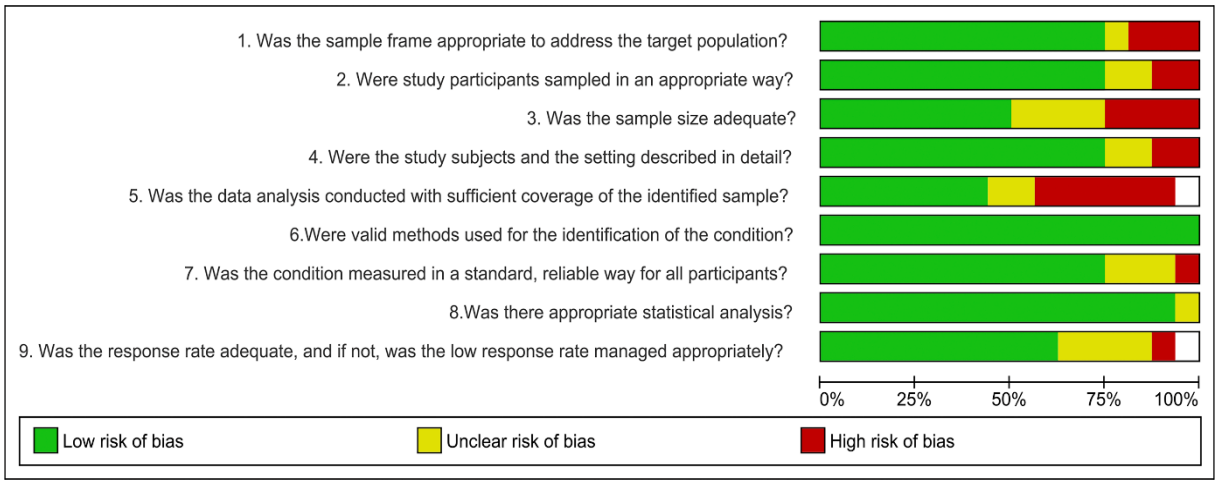

Table 1 – Summary of descriptive characteristics of included articles adopting RDC/TMD axis I in temporomandibular joint disorders (n=13)

STUDY	POPULATION		PREVALENCE OF SINGLE DIAGNOSIS (n/%)						PREVALENCE OF MULTIPLE DIAGNOSIS (n/%)			
Author (Year); Country	Sample (F)	Age in years (mean±SD, range)	DISC DISPLACEMENTS (GROUP II)			ARTHRALGIA, OSTEOARTHRITIS AND OSTEOARTHROSIS (GROUP III)			Group I + Group II	Group I + Group III	Group II + Group III	Group I + Group II + Group III
			DDwR	DDwoR with limited opening	DDwoR without limited opening	Arthralgia	Osteoarthritis	Osteoarthrosis				
Al-Khotani et al. (2016); Sweden	456(272)	14.0±2.3	TMJ right ** 21.8†(4.8) TMJ left ** 22.8†(5) Total:45†(9.8)	NR	NR	TMJ right ** 15†(3.3) TMJ left ** 15†(3.3) Total:30†(6.6)	TMJ right ** 0(0) TMJ left ** 1†(0.2) Total:1†(0.2)	TMJ right ** 10†(2.2) TMJ left ** 6.8†(1.5) Total:17†(3.7)	NR	NR	NR	NR
Aravena et al. (2016); Chile	186(91)	15.4±1.25	Overall: 12(6.45) **			Overall: 13(6.99) **			3(1.61) **	5(2.69) **	2(1.08) **	NR
Balke et al. (2010); Germany	223(171)	32.07±10.83	Overall: age groups for urban population * ≤ 24: 1(4.2) 25 to 34: 3(7.3) 35 to 44: 5(12.5) 45 to 54: 0(0.0) 55 to 65: 1(16.7) Overall: age groups for rural population * ≤ 24: 5(11.1) 25 to 34: 2(6.5) 35 to 44: 1(5.5) 45 to 54: 1(20.0) 55 to 65: 3(60.0)			Overall: age groups for urban population * ≤24: 1(3.3) 25 to 24: 5(12.2) 35 to 44: 5(12.5) 45 to 54: 1(12.5) 55 to 65: 0(0.0) Overall: age groups for rural population * ≤24: 9(20.0) 25 to 24: 3(9.7) 35 to 44: 2(11.1) 45 to 54: 1(20.0) 55 to 65: 1(20.0)			NR	NR	NR	NR
Bertoli et al. (2018); Brazil	934(518)	11.32±1.2	75(8.0) **	0(0.0) **	0(0.0) **	33(3.5) **	0(0.0) **	0(0.0) **	NR	NR	NR	NR
De Melo Junior et al. (2019); Brazil	1342(922)	Ranged from 10 to 17	Overall: 135(30.3) **			Overall: 173(38.9) **			9(2.0) **	46(2.3) **	24(5.4) **	7(1.6) **

Guerrero et al. (2017); Chile	270(168)	F: 42.0±15.7 M: 44.4±17.0	TMJ right ** 42(15.56) TMJ left ** 44(16.30) Total:86(31.86)	TMJ right ** 0(0.0) TMJ left ** 0(0.0) Total: 0(0.0)	TMJ right **1(0.37) TMJ left **1(0.74) Total:2(1.11)	TMJ right ** 46(17.04) TMJ left ** 49(18.15) Total:95(35.19)	TMJ right ** 5(1.85) TMJ left ** 4(1.48) Total:9(3.33)	TMJ right ** 13(4.81) TMJ left ** 15(5.56) Total:28(10.37)	NR	NR	NR	NR
Hirsch et al. (2008); Germany and United States of America	893(506)	40.6±11.7	Overall age group 20-60 ** 100(11.2) Age groups for men * 20 to 29: 4(5.0) 30 to 39: 3(3.6) 40 to 49: 9(8.2) 50 to 60: 8(7.1) Age groups for women * 20 to 29: 22(16.7) 30 to 39: 16(13.6) 40 to 49: 19(15.3) 50 to 60: 19(14.4)	NR	NR	NR	NR	NR	NR	Overall age group 20-60 ** 25(2.8) Age groups for men * 20 to 29: 1(1.2) 30 to 39: 1(1.2) 40 to 49: 1(0.9) 50 to 60: 3(2.6) Age groups for women * 20 to 29: 6(4.5) 30 to 39: 5(4.2) 40 to 49: 2(1.6) 50 to 60: 6(4.5)	NR	NR
Hirsch et al. (2012); Germany and Switzerland	1011(525)	Ranged from 10 to 17	80(7.9) **	NR	NR	Overall: 23(2.3) ** *Results for Group I and/or III			NR	NR	NR	NR
Marpaung et al. (2018); Indonesia and The Netherlands	1562(NR)	Children (n=546) 9.5±1.7 Adolescents (n=812)	Children 109†(7.0) ** Adolescents 225†(14.4) ** Adults	NR	NR	NR	NR	NR	NR	NR	NR	NR

		15.0±1.5 Adults (n=204) 20.0±0.8	192†(12.3) **									
Paduano et al. (2018); Italy	361(183)	16.17±1.47 (14 to 18)	47(13.0) **	0(0.0) **	0(0.0) **	7(1.9) **	2(0.6) **	0(0.0) **	NR	NR	NR	NR
Pereira et al. (2010); Brazil	558(330)	All subjects were 12-year-old	Boys: 0(0.0) ** Girls: 3(0.5†) ** Total:3†(0.5†)	Boys: 0(0.0) ** Girls: 0(0.0) ** Total:0†(0†)	Boys: 0(0.0) ** Girls: 2(0.3†) ** Total:2†(0.3†)	Boys: 1(0.1†) ** Girls: 4(0.7†) ** Total:5†(0.8†)	NR	NR	NR	NR	NR	NR
Progiante et al. (2015); Brazil	1643(1083)	32.7±10.3 (20 to 49)	Right or left TMJ: 73(4.4) ** Right and left TMJ: 34(2.1) ** With pain: Right or left TMJ: 22(1.3) ** Right and left TMJ: 14(0.9) **	Overall: disc displacement without reduction: Right or left TMJ: 23(1.4) ** Right and left TMJ: 0(0.0) **		Right or left TMJ: 93(5.7) ** Right and left TMJ: 263(16.0) **	Right or left TMJ: 32(1.9) ** Right and left TMJ: 53(3.2) **	Right or left TMJ: 85(5.2) ** Right and left TMJ: 116(7.1) **	NR	NR	NR	NR
Wu et al. (2010); Germany and China	1058(534)	Ranged from 13 to 18 Germany: 14.7±1.1 China: 15.7±1.7	Overall ** Germany: 60(10.7) China: 33(6.6)				Overall ** Germany: 8(1.4) China: 26(5.2)		Overall ** Germany: 1(0.2) China: 0(0.0)	Overall ** Germany: 0(0.0) China: 9(1.8)	Overall ** Germany: 2(0.4) China: 2(0.4)	NR

Group I: muscle disorders; Group II: disc displacements; Group III: arthralgia, osteoarthritis and osteoarthrosis; DDwR: disc displacement with reduction; DDwoR: disc displacement without reduction; F: female; NR: not reported; TMJ: temporomandibular joint; RDC/TMD: Research Diagnostic Criteria for Temporomandibular Disorders; * Percentage regarding TMD subgroup; ** Percentage regarding total sample; † Calculated by systematic review authors

Table 2 - Summary of descriptive characteristics of included articles adopting DC/TMD axis I in temporomandibular joint disorders (n=3)

STUDY	POPULATION		PREVALENCE OF SINGLE DIAGNOSIS (n/%)						
Author (Year); Country	**Sample (F)**	**Age in years* (mean±SD, range)**	**Arthralgia**	**Disc displacement with reduction**	**Disc displacement with reduction with intermittent locking**	**Disc displacement without reduction with limited opening**	**Disc displacement without reduction without limited opening**	**Degenerative joint disease**	**Subluxation**
Murrieta et al. (2016); Mexico	154(116)	At least 60	3†(1.9) **	32†(20.8) **	NR	3†(1.9) **	5†(3.3) **	2†(1.3) **	NR
Nguyen et al. (2017); Estonia and Vietnam	258(128)	Ranged from 65 to 74	3(1.2) **			Overall: disc displacement 97(37.6) **		88(34.9) **	NR
Wieckiewicz et al. (2019); Poland	213(149)	37±15.8	45†(21.1) **	102(47.9) **	0	0	1(0.4†) **	3(1.4†) **	0

F: female; NR: not reported; DC/TMD: Diagnostic Criteria for Temporomandibular Disorders; ** Percentage regarding total sample; † Calculated by systematic review authors

Table 3 - Summary of prevalence of temporomandibular joint disorders from meta-analyses

Meta-analysis	RDC/TMD	RDC/TMD and DC/TMD	DC/TMD
	Prevalence (95% CI) (number of ncluded studies)	**Prevalence (95% CI) (number of included studies)**	**Prevalence (95% CI) (number of included studies)**
Adults and elderly			
Overall - any joint diagnosis	37% (6.5-75.2) (n=4)	37.6% (13.8-65.1) (n=6)	38.9% (21.0-58.5) (n=2)
• Arthralgia	17.9% (0.2-53.8) (n=2)	10.1% (2.2-22.8) (n=5)	6.0% (0.0-21.4) (n=3)
Overall - Disc displacements	28.8% (7.5-56.9) (n=5)	31.8% (14.0-52.9) (n=8)	37.2% (25.8-49.4) (n=3)
• Disc displacement with reduction	33.5% (6.6-68.5) (n=4)	33.6% (11.2-60.9) (n=6)	33.8% (10.9-61.7) (n=2)
• Disc displacement without reduction without limited opening	-	-	1.7% (0.0-5.5) (n=2)
• Disc displacement without reduction with limited opening	-	-	0.8% (0.0-4.1) (n=2)
Overall - Degenerative joint disease (osteoarthritis and osteoarthrosis)	10% (4.5-17.4) (n=2)	9.1% (2.3-19.5) (n=5)	8.3% (0.2-35.2) (n=3)
• Osteoarthritis	2.4% (1.2-4.0) (n=2)	-	-
• Osteoarthrosis	7.4% (3.1-13.3) (n=2)	-	-
Children and adolescents			
Overall - any joint diagnosis	12.6% (7.6-18.5) (n=9)	-	-
• Arthralgia	2.9% (1.1-5.5) (n=4)	-	-
Overall - Disc displacements	9.2% (5.2-14.0) (n=9)	-	-
• Disc displacement with reduction	9.3% (3.5-17.6) (n=6)	-	-
• Disc displacement without reduction without limited opening	0.1% (0.0-0.4) (n=3)	-	-
• Disc displacement without reduction with limited opening	0.0% (0.0-0.1) (n=3)	-	-
Overall - Degenerative joint disease (osteoarthritis and osteoarthrosis)	0.9% (0.0-4.4) (n=3)	-	-
• Osteoarthritis	0.2% (0.0-0.7) (n=3)	-	-
• Osteoarthrosis	0.6% (0.1-3.6) (n=3)	-	-

Supplementary table 1 – Data search strategy

Database	Search query
EMBASE	#1 = ('temporomandibular joint disorders':ta,ab OR 'temporomandibular joint disorder':ta,ab OR 'temporomandibular disorder':ta,ab OR 'temporomandibular disorders':ta,ab OR 'tmj disorder':ta,ab OR 'tmj disorders':ta,ab OR 'temporomandibular joint disease':ta,ab OR 'temporomandibular joint diseases':ta,ab OR 'tmj disease':ta,ab OR 'tmj diseases':ta,ab OR 'temporomandibular joint dysfunction':ta,ab OR 'temporomandibular joint dysfunctions':ta,ab OR 'tmj dysfunction':ta,ab OR 'tmj dysfunctions':ta,ab OR 'temporomandibular joint syndrome':ta,ab OR 'temporomandibular joint syndromes':ta,ab OR 'tmj pain':ta,ab OR 'temporomandibular pain':ta,ab OR 'temporomandibular joint pain':ta,ab OR 'temporomandibular joint pain dysfunction syndrome':ta,ab OR tmd:ta,ab OR tmjd:ta,ab OR 'temporomandibular joint dysfunction syndrome':ta,ab) #2 = ('prevalence':ta,ab OR 'occurrence':ta,ab OR 'occurrences':ta,ab OR 'prevalences':ta,ab OR 'frequency':ta,ab OR 'frequencies':ta,ab OR 'incidences':ta,ab OR 'incidence':ta,ab) AND ([article]/lim) #3 = #1 AND #2
LILACS	("temporomandibular joint disorders" OR "temporomandibular joint disorders" OR "temporomandibular joint disorder" OR "temporomandibular disorder" OR "temporomandibular disorders" OR "tmj disorder" OR "tmj disorders" OR "temporomandibular joint disease" OR "temporomandibular joint diseases" OR "temporomandibular disease" OR "temporomandibular diseases" OR "tmj disease" OR "tmj diseases" OR "temporomandibular joint dysfunction" OR "temporomandibular joint dysfunctions" OR "temporomandibular dysfunction" OR "temporomandibular dysfunctions" OR "temporomandibular joint dysfunction syndrome" OR "temporomandibular joint dysfunction syndrome" OR "tmj dysfunction" OR "tmj dysfunctions" OR "temporomandibular joint syndrome" OR "temporomandibular joint syndromes" OR "tmj pain" OR "temporomandibular pain" OR "temporomandibular joint pain" OR "temporomandibular joint pain dysfunction syndrome" OR tmd OR tmjd OR "Transtornos da Articulaçao Temporomandibular" OR "Transtorno da articulaçao temporomandibular" OR "Disfunçao Temporomandibular" OR "Disfunçoes Temporomandibulares" OR "Disfunçao da ATM" OR "Disfunçoes da ATM" OR "Sindrome da disfunçao temporomandibular" OR "transtorno da aticulaçao temporomandibular" OR "transtornos da aticulaçao temporomandibular" OR "desordem temporomandibular" OR "desordens temporomandibulares" OR "desordem da ATM" OR "desordens da ATM" OR dtm OR "Transtorno da ATM" OR "Transtornos da ATM" OR "desordem temporomandibular" OR "disfunção temporomandibular" OR "transtorno

	temporomandibular" OR "disfunción temporomandibular" OR "Trastornos de la Articulación Temporomandibular" OR "Trastorno ATM") AND (predominio OR ocurrencia OR prevalencias OR frecuencia OR frecuencias OR incidencia OR incidencias OR prevalência OR ocorrência OR prevalências OR frequência OR frequências OR incidências OR incidência OR epidemiologia OR epidemiológico OR epidemiología)
PubMed	#1 = ("temporomandibular joint disorders"[MeSH Terms] OR "temporomandibular joint disorders"[All Fields] OR "temporomandibular joint disorder"[All Fields] OR "temporomandibular joint disease"[All Fields] OR "temporomandibular joint diseases"[All Fields] OR "temporomandibular joint dysfunction syndrome"[MeSH Terms] OR "temporomandibular joint dysfunction syndrome"[All Fields] OR "temporomandibular joint syndrome"[All Fields] OR "temporomandibular joint syndromes"[All Fields] OR "temporomandibular joint dysfunction"[All Fields] OR "tmj disease"[All Fields] OR "tmd"[All Fields] OR "tmj"[All Fields] OR "tmjd"[All Fields] OR "tmj disorders"[All Fields] OR "tmj disorder"[All Fields] OR "tmj diseases"[All Fields] OR "temporomandibular joint"[MeSH Terms] OR "temporomandibular joint dysfunctions"[All Fields]) OR "articular temporomandibular disorder" OR "articular temporomandibular disorders" OR "articular temporomandibular dysfunction" OR "articular temporomandibular dysfunctions") #2 = ("prevalence"[MeSH Terms] OR "prevalence"[Title] OR "occurrence"[Title] OR "occurrences"[Title] OR "prevalences"[Title] OR "frequency"[Title] OR "frequencies"[Title] OR "incidence"[Title] OR "incidences"[Title] OR "incidence"[MeSH Terms]) #4 = #1 AND #2
SCOPUS	TITLE-ABS-KEY("temporomandibular joint disorder" OR "temporomandibular joint disorders" OR "temporomandibular disorder" OR "temporomandibular disorders" OR "temporomandibular joint disease" OR "temporomandibular joint diseases" OR "temporomandibular dysfunction" OR "temporomandibular dysfunctions" OR "temporomandibular joint syndrome" OR "temporomandibular joint syndromes" OR "temporomandibular joint dysfunction" OR "temporomandibular joint dysfunctions" OR "tmj disease" OR tmd OR tmj OR tmjd OR "tmj disorders" OR "tmj disorder" OR "tmj diseases" OR "temporomandibular joint dysfunction syndrome") AND TITLE("prevalence" OR "prevalence" OR "occurrence" OR "occurrences" OR "prevalences" OR "frequency" OR "frequencies" OR "incidence" OR "incidences" OR "incidence")
Web of Science (Articles)	(TS=("temporomandibular joint disorder" OR "temporomandibular joint disorders" OR "temporomandibular disorder" OR "temporomandibular disorders" OR "temporomandibular joint disease" OR "temporomandibular joint diseases" OR "temporomandibular dysfunction" OR "temporomandibular dysfunctions" OR "temporomandibular

	joint syndrome" OR "temporomandibular joint syndromes" OR "temporomandibular joint dysfunction" OR "temporomandibular joint dysfunctions" OR "tmj disease" OR tmd OR tmj OR tmjd OR "tmj disorders" OR "tmj disorder" OR "tmj diseases" OR "temporomandibular joint dysfunction syndrome") AND TI=("prevalence" OR "prevalence" OR "occurrence" OR "occurrences" OR "prevalences" OR "frequency" OR "frequencies" OR "incidence" OR "incidences" OR "incidence")) AND DOCUMENT TYPES: (Article)
Grey Literature	
Google Scholar (First 100 references)	("temporomandibular joint disorder" OR "temporomandibular disorder" OR OR "temporomandibular joint disease" OR "temporomandibular dysfunction" OR TMJ OR TMD) AND ("prevalence" OR "frequency" OR "frequencies" OR "incidence")
Open Grey	("temporomandibular joint disorder" OR "temporomandibular joint disorders" OR "temporomandibular disorder" OR "temporomandibular disorders" OR "temporomandibular joint disease" OR "temporomandibular joint diseases" OR "temporomandibular dysfunction" OR "temporomandibular dysfunctions" OR "temporomandibular joint syndrome" OR "temporomandibular joint syndromes" OR "temporomandibular joint dysfunction" OR "temporomandibular joint dysfunctions" OR "tmj disease" OR tmd OR tmj OR tmjd OR "tmj disorders" OR "tmj disorder" OR "tmj diseases" OR "temporomandibular joint dysfunction syndrome") AND ("prevalence" OR "prevalence" OR "occurrence" OR "occurrences" OR "prevalences" OR "frequency" OR "frequencies" OR "incidence" OR "incidences" OR "incidence")
Proquest	noft("temporomandibular joint disorder" OR "temporomandibular joint disorders" OR "temporomandibular disorder" OR "temporomandibular disorders" OR "temporomandibular joint disease" OR "temporomandibular joint diseases" OR "temporomandibular dysfunction" OR "temporomandibular dysfunctions" OR "temporomandibular joint syndrome" OR "temporomandibular joint syndromes" OR "temporomandibular joint dysfunction" OR "temporomandibular joint dysfunctions" OR "tmj disease" OR tmd OR tmj OR tmjd OR "tmj disorders" OR "tmj disorder" OR "tmj diseases" OR "temporomandibular joint dysfunction syndrome") AND noft("prevalence" OR "prevalence" OR "occurrence" OR "occurrences" OR "prevalences" OR "frequency" OR "frequencies" OR "incidence" OR "incidences" OR "incidence")

Supplementary table 2 – Articles excluded and the reasons for exclusion

Reference	Authors	Reason for exclusion
1.	Almeida et al. (2019)	7
2.	Rauch et al. (2019)	8
3.	Miranda (2007)	7
4.	Cornick et al. (1998)	1
5.	Anderson et al. (1996)	1
6.	Abrahamsson et al (2009)	7
7.	Gonçalves et al. (2013)	8
8.	Marklund et al. (2007)	5
9.	Marklund et al. (2010)	5
10.	Michelotti et al. (2010)	7
11.	Pereira et al. (2009)	2
12.	Nagamatsu-Sakaguchi (2008)	7
13.	Huddleston Slater et al. (2007)	1
14.	Ajanović et al. (2013)	8
15.	Al-Omari et al. (2012)	1
16.	Alamoudi et al. (1998)	10
17.	Alrashdan et al. (2019)	7
18.	AlShaban et al. (2018)	8
19.	Anon (2006)	10
20.	Arslan et al. (2009)	7
21.	Badel et al. (2004)	1
22.	Bernhardt et al. (2007)	1
23.	Biondi et al. (2014)	9
24.	Bonotto et al. (2016)	3
25.	Casanova-Rosado et al. (2006)	7
26.	Celic et al. (2002)	7

27.	Cortese et al. (2015)	7
28.	Costa et al. (2004)	10
29.	Dantas et al. (2018)	7
30.	Diercke et al. (2016)	8
31.	Dworkin (2013)	9
32.	Faulin et al. (2015)	7
33.	Fernandes et al. (2017)	7
34.	Ferreira et al. (2012)	7
35.	Franco-Micheloni et al. (2014)	6
36.	Friedman Rubin et al. (2017)	7
37.	Gavião et al. (2012)	9
38.	Goddard (1995)	3
39.	Golubev et al. (2005)	10
40.	Gonçalves et al. (2009)	9
41.	Gonçalves et al. (2010)	9
42.	Gonçalves et al. (2009)	1
43.	Gonzalez (2003)	10
44.	Graue et al. (2016)	7
45.	Gray et al. (1997)	1
46.	Gremillion (2000)	9
47.	Han et al. (2018)	6
48.	Herrera (2004)	10
49.	Hongxing et al. (2016)	1
50.	Huhtela et al. (2016)	1
51.	Jiménez-Silva et al. (2016)	7
52.	Jivnani et al. (2017)	7
53.	Jordani (2014)	3
54.	Joury et al. (2018)	1

55.	Jurkemik et al. (2015)	1
56.	Katzberg et al. (1996)	1
57.	Katzberg et al. (1996)	1
58.	Köhler et al. (2009)	1
59.	Lacerda et al. (2015)	3
60.	Lima (2009)	7
61.	Lipton et al. (1993)	1
62.	Lora et al. (2016)	3
63.	Loster et al. (2015)	7
64.	Lövgren et al. (2018)	7
65.	Magalhães et al. (2014)	9
66.	Maia et al. (2002)	10
67.	Mello et al. (2014)	6
68.	Merighi et al. (2007)	1
69.	Montero et al. (2018)	1
70.	Motohashi et al. (2009)	1
71.	Moyaho-Bernal et al. (2010)	6
72.	Muhvić-Urek et al. (2007)	7
73.	Muñoz-Quintana et al. (2011)	6
74.	Nguyen et al. (2015)	2
75.	Nilsson (2007)	7
76.	Oskol'skii et al. (2010)	10
77.	Østensjø et al. (2017)	7
78.	Ozan et al. (2007)	1
79.	Pampel et al. (2014)	3
80.	Passos et al. (2015)	7
81.	Paulino et al. (2018)	1
82.	Pedroni et al. (2003)	1

83.	Pesqueira et al. (2010)	6
84.	Pozzebon et al. (2016)	6
85.	Puri et al. (1994)	10
86.	Rao et al. (1994)	10
87.	Reißmann et al. (2009)	7
88.	Renhe et al. (2016)	3
89.	Ribeiro (2004)	1
90.	Ricci (2005)	1
91.	Rodriguez-Lozano et al. (2010)	1
92.	Rojas-Martínez et al. (2014)	7
93.	Saldanha et al. (2012)	7
94.	Sale et al. (2013)	1
95.	Sandoval et al. (2015)	7
96.	Saruhanoğlu et al. (2017)	8
97.	Schmitter et al. (2010)	7
98.	Schmitter et al. (2005)	8
99.	Schmitter et al. (2008)	7
100.	Seckin et al. (2005)	1
101.	Shet et al. (2013)	1
102.	Oliveira et al. (2011)	10
103.	Slade et al. (2013)	5
104.	Solak et al. (2009)	3
105.	Souza et al. (2014)	3
106.	Stechman et al. (2009)	1
107.	Stockstill et al. (1998)	1
108.	Stohler (1997)	9
109.	Svechtarov et al. (2015)	7
110.	Tak; Chalkoo (2018)	1

111.	Tallents et al. (2002)	1
112.	Tanaka et al. (2016)	3
113.	Tasaki et al. (1996)	1
114.	Tecco; Festa (2010)	8
115.	Troeltzsch et al. (2010)	7
116.	Tuuliainen et al. (2015)	8
117.	Llanos (1992)	1
118.	Ajanović et al. (2014)	8
119.	Vilalta et al. (2012)	9
120.	Von Piekartz et al. (2016)	9
121.	Wahlund (2003)	10
122.	Whyte et al. (2006)	1
123.	Wiberg; Wanman (1998)	1
124.	Widmalm et al. (1995)	1
125.	Widmalm et al. (1995)	1
126.	Wieckiewicz et al. (2014)	7
127.	Yekkalam; Wanman (2014)	1
128.	Zarb; Carlsson (1999)	9
129.	Jussila et al. (2017)	1

Reasons for exclusion: 1) Did not use RDC/TMD (studies published before 1992) or DC/TMD; 2) Duplicate data; 3) Patients with full prosthesis or orthodontic treatment or athletes or pregnant or obese or musician or postmenopausal women or full/partial edentulous; 4) Studies focused in patients with comorbidities or any other syndrome associated to joint TMD; 5) Reporting only annual incidences of TMD; 6) Did not investigate joint TMD or did not provide separate data of joint TMD; 7) Studies with convenience sample or a sample in which all patients had TMD; 8) Report only signs and symptoms of joint TMD; 9) Reviews, letters, books, conference abstract, expert opinion, case reports, technique articles, posters, guidelines, pilot studies; 10) Full-text not available.

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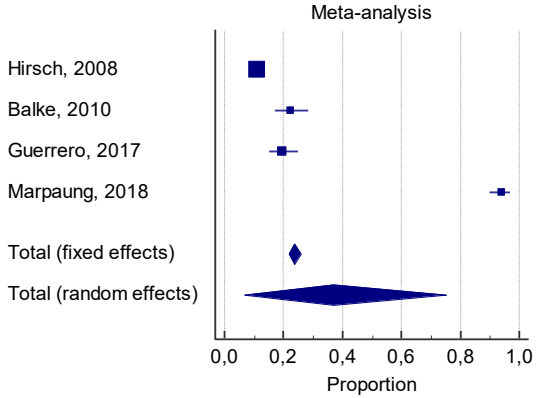
Supplementary table 3 – Risk of bias results from the Joanna Briggs Institute Critical Appraisal Checklist for Analytical for Studies Reporting Prevalence Data: author's judgments for each included study

Risk of Bias for Systematic Reviews **(JBI Analytical Cross-sectional)** **Answers:** Yes (Y); No (N); Unclear (U); Not applicable (NA) **Overall risk of bias:** LOW, MODERATE, HIGH	Hirsch et al. (2008)	Balke et al. (2010)	Pereira et al. (2010)	Wu et al. (2010)	Hirsch et al. (2012)	Progiante et al. (2015)	Al-Khotani et al. (2016)	Aravena et al. (2016)	Murrieta et al. (2016)	Guerrero et al. (2017)	Nguyen et al. (2017)	Bertoli et al. (2018)	Marpaung et al. (2018)	Paduano et al. (2018)	De Melo Júnior et al. (2019)	Wieckiewicz et al. (2019)
1. Was the sample frame appropriate to address the target population?	Y	N	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	U	Y
2. Were study participants sampled in an appropriate way?	U	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	U	Y	Y	N
3. Was the sample size adequate?	Y	U	Y	N	U	Y	Y	Y	N	Y	U	Y	U	N	Y	N
4. Were the study subjects and the setting described in detail?	U	Y	Y	Y	Y	Y	Y	Y	N	N	Y	U	Y	Y	Y	Y
5. Was the data analysis conducted with sufficient coverage of the identified sample?	N	Y	N	N	Y	Y	N	Y	N	N	Y	Y	U	U	Y	NA
6.Were valid methods used for the identification of the condition?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7. Was the condition measured in a standard, reliable way for all participants?	Y	U	Y	Y	U	Y	Y	Y	Y	N	Y	Y	Y	U	Y	Y
8.Was there appropriate statistical analysis?	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?	Y	Y	Y	Y	U	Y	Y	Y	U	N	U	Y	U	Y	Y	NA
PERCENTAGE OF SCORE "Y"	66.6%	66.6%	88.8%	77.7%	66.6%	88.8%	88.8%	88.8%	44.4%	44.4%	77.7%	88.8%	55.5%	66.6%	88.8%	71.4%
OVERALL RISK OF BIAS	MODERATE	MODERATE	LOW	LOW	MODERATE	LOW	LOW	LOW	HIGH	HIGH	LOW	LOW	MODERATE	MODERATE	LOW	LOW

Supplementary table 4 – Results from all meta-analyses

A) Meta-analyses from research diagnostic criteria for temporomandibular disorders (RDC/TMD):

1) RDC/TMD – Adults and elderly – Overall – Any diagnosis

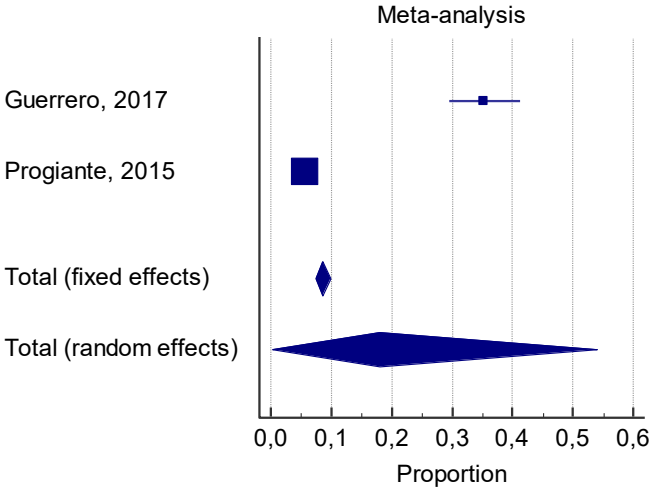


Study	Sample size	Proportion (%)	95% CI
Hirsch, 2008	893	11,198	9,205 to 13,452
Balke, 2010	223	22,422	17,123 to 28,468
Guerrero, 2017	270	19,630	15,063 to 24,876
Marpaung, 2018	204	94,118	89,950 to 96,924
Total (fixed effects)	1590	23,788	21,717 to 25,957
Total (random effects)	1590	37,014	6,535 to 75,204

Test for heterogeneity

Q	643,6850
DF	3
Significance level	P < 0,0001
I^2 (inconsistency)	99,53 %
95% CI for I^2	99,36 to 99,66

2) RDC/TMD – Adults and elderly – Arthralgia

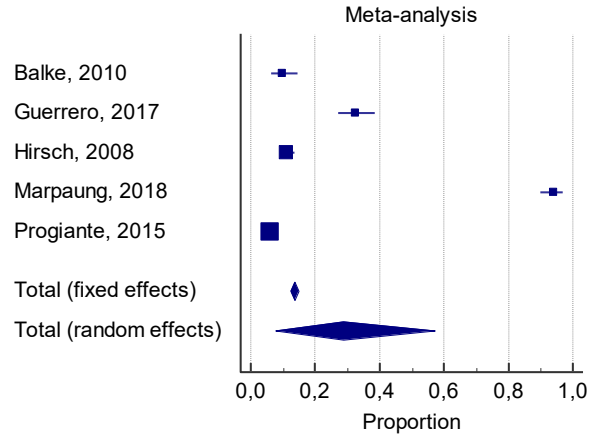


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	35,185	29,495 to 41,205
Progiante, 2015	1643	5,660	4,593 to 6,890
Total (fixed effects)	1913	8,546	7,332 to 9,889
Total (random effects)	1913	17,928	0,253 to 53,863

Test for heterogeneity

Q	145,0216
DF	1
Significance level	P < 0,0001
I^2 (inconsistency)	99,31 %
95% CI for I^2	98,73 to 99,62

3) RDC/TMD – Adults and elderly – Overall – Disc displacements

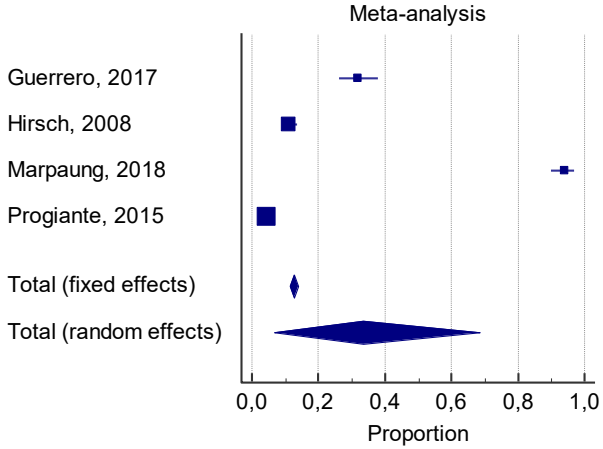


Study	Sample size	Proportion (%)	95% CI
Balke, 2010	223	9,865	6,286 to 14,555
Guerrero, 2017	270	32,593	27,035 to 38,537
Hirsch, 2008	893	11,198	9,205 to 13,452
Marpaung, 2018	204	94,118	89,950 to 96,924
Progiante, 2015	1643	5,843	4,758 to 7,089
Total (fixed effects)	3233	13,451	12,294 to 14,674
Total (random effects)	3233	28,820	7,531 to 56,976

Test for heterogeneity

Q	911,3499
DF	4
Significance level	P < 0,0001
I^2 (inconsistency)	99,56 %
95% CI for I^2	99,43 to 99,66

4) RDC/TMD – Adults and elderly – Disc displacement with reduction

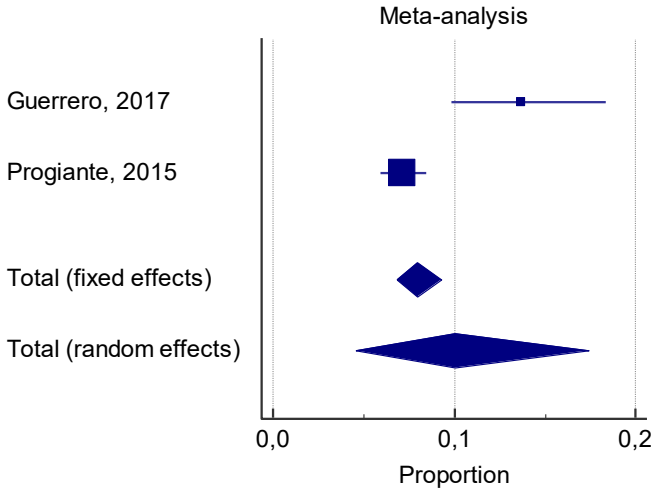


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	31,852	26,336 to 37,771
Hirsch, 2008	893	11,198	9,205 to 13,452
Marpaung, 2018	204	94,118	89,950 to 96,924
Progiante, 2015	1643	4,443	3,499 to 5,554
Total (fixed effects)	3010	12,507	11,347 to 13,741
Total (random effects)	3010	33,558	6,629 to 68,538

Test for heterogeneity

Q	963,6002
DF	3
Significance level	P < 0,0001
I^2 (inconsistency)	99,69 %
95% CI for I^2	99,59 to 99,76

5) RDC/TMD – Adults and elderly – Overall – Degenerative joint disease (osteoarthritis and osteoarthrosis)

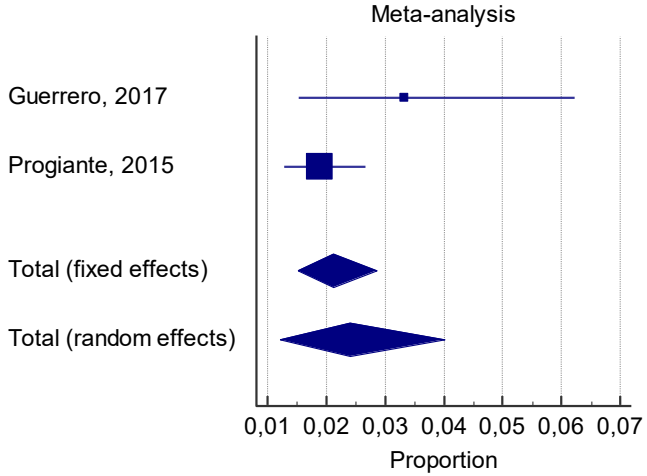


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	13,704	9,836 to 18,391
Progiante, 2015	1643	7,121	5,925 to 8,473
Total (fixed effects)	1913	7,974	6,799 to 9,279
Total (random effects)	1913	10,039	4,523 to 17,415

Test for heterogeneity

Q	11,3650
DF	1
Significance level	P = 0,0007
I^2 (inconsistency)	91,20 %
95% CI for I^2	68,84 to 97,52

6) RDC/TMD – Adults and elderly – Osteoarthritis

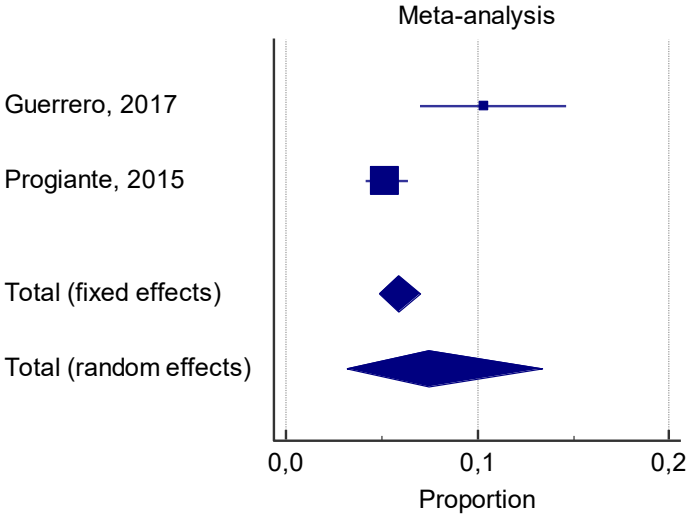


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	3,333	1,535 to 6,233
Progiante, 2015	1643	1,887	1,285 to 2,668
Total (fixed effects)	1913	2,112	1,516 to 2,861
Total (random effects)	1913	2,407	1,201 to 4,015

Test for heterogeneity

Q	2,2724
DF	1
Significance level	P = 0,1317
I^2 (inconsistency)	55,99 %
95% CI for I^2	0,00 to 89,38

7) RDC/TMD – Adults and elderly – Osteoarthrosis

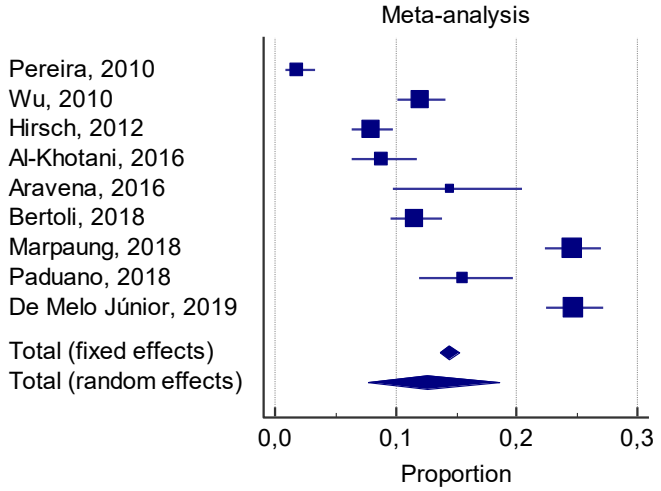


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	10,370	7,002 to 14,639
Progiante, 2015	1643	5,173	4,153 to 6,358
Total (fixed effects)	1913	5,848	4,839 to 6,995
Total (random effects)	1913	7,443	3,150 to 13,361

Test for heterogeneity

Q	9,3392
DF	1
Significance level	P = 0,0022
I^2 (inconsistency)	89,29 %
95% CI for I^2	59,99 to 97,13

8) RDC/TMD – Children and adolescents – Overall – Any diagnosis

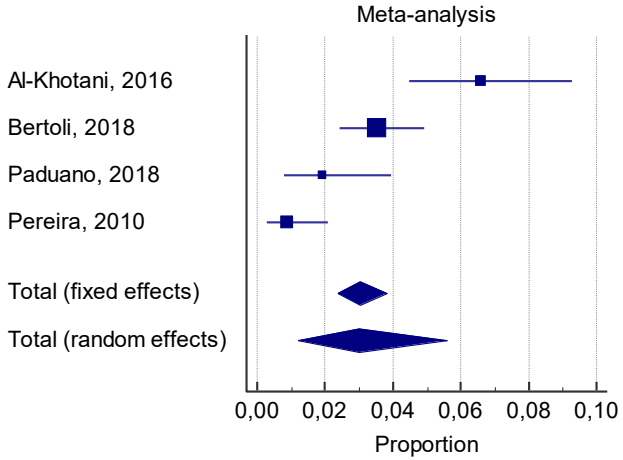


Study	Sample size	Proportion (%)	95% CI
Pereira, 2010	558	1,792	0,863 to 3,271
Wu, 2010	1058	12,004	10,106 to 14,116
Hirsch, 2012	1011	7,913	6,324 to 9,752
Al-Khotani, 2016	456	8,772	6,341 to 11,753
Aravena, 2016	186	14,516	9,789 to 20,413
Bertoli, 2018	934	11,563	9,583 to 13,790
Marpaung, 2018	1358	24,595	22,325 to 26,976
Paduano, 2018	361	15,512	11,936 to 19,667
De Melo Júnior, 2019	1342	24,739	22,451 to 27,139
Total (fixed effects)	7264	14,393	13,594 to 15,221
Total (random effects)	7264	12,625	7,680 to 18,584

Test for heterogeneity

Q	395,5551
DF	8
Significance level	P < 0,0001
I^2 (inconsistency)	97,98 %
95% CI for I^2	97,23 to 98,52

9) RDC/TMD – Children and adolescents – Arthralgia

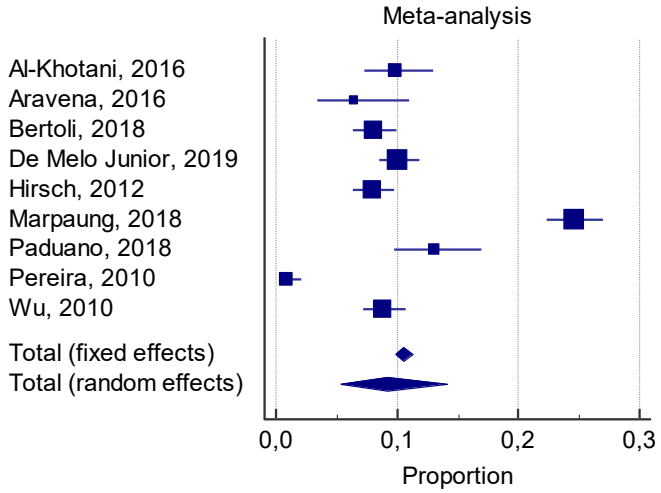


Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	6,579	4,482 to 9,259
Bertoli, 2018	934	3,533	2,444 to 4,926
Paduano, 2018	361	1,939	0,783 to 3,954
Pereira, 2010	558	0,896	0,292 to 2,079
Total (fixed effects)	2309	3,038	2,377 to 3,821
Total (random effects)	2309	2,994	1,187 to 5,590

Test for heterogeneity

Q	28,6915
DF	3
Significance level	P < 0,0001
I^2 (inconsistency)	89,54 %
95% CI for I^2	76,05 to 95,44

10) RDC/TMD – Children and adolescents – Overall – Disc displacements



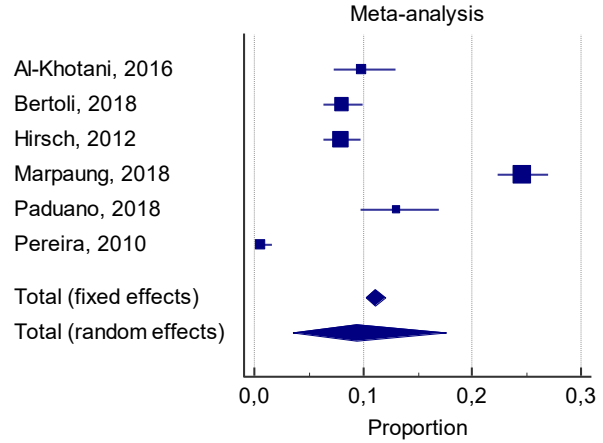
Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	9,868	7,289 to 12,982
Aravena, 2016	186	6,452	3,378 to 10,998
Bertoli, 2018	934	8,030	6,368 to 9,962
De Melo Junior, 2019	1342	10,060	8,502 to 11,795
Hirsch, 2012	1011	7,913	6,324 to 9,752
Marpaung, 2018	1358	24,595	22,325 to 26,976

Paduano, 2018	361	13,019	9,725 to 16,935
Pereira, 2010	558	0,896	0,292 to 2,079
Wu, 2010	1058	8,790	7,153 to 10,660
Total (fixed effects)	7264	10,526	9,830 to 11,254
Total (random effects)	7264	9,215	5,296 to 14,081

Test for heterogeneity

Q	337,6059
DF	8
Significance level	P < 0,0001
I^2 (inconsistency)	97,63 %
95% CI for I^2	96,70 to 98,30

11) RDC/TMD – Children and adolescents – Disc Displacement with reduction



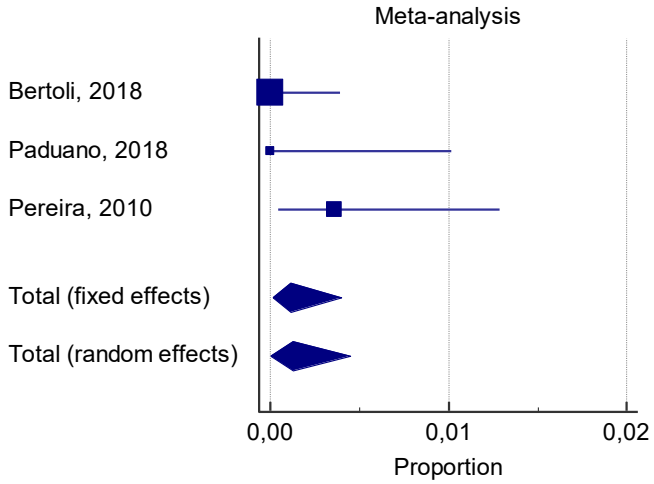
Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	9,868	7,289 to 12,982
Bertoli, 2018	934	8,030	6,368 to 9,962

Hirsch, 2012	1011	7,913	6,324 to 9,752
Marpaung, 2018	1358	24,595	22,325 to 26,976
Paduano, 2018	361	13,019	9,725 to 16,935
Pereira, 2010	558	0,538	0,111 to 1,563
Total (fixed effects)	4678	11,078	10,193 to 12,011
Total (random effects)	4678	9,356	3,503 to 17,640

Test for heterogeneity

Q	350,6433
DF	5
Significance level	P < 0,0001
I^2 (inconsistency)	98,57 %
95% CI for I^2	97,97 to 99,00

12) RDC/TMD – Children and adolescents – Disc displacement without reduction without limited opening

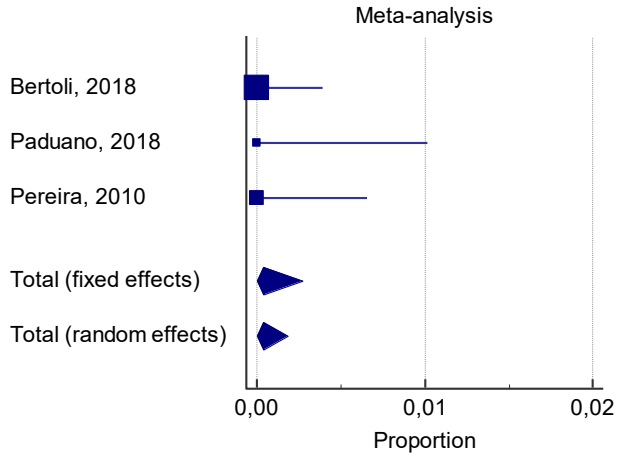


Study	Sample size	Proportion (%)	95% CI
Bertoli, 2018	934	0,000	0,000 to 0,394
Paduano, 2018	361	0,000	0,000 to 1,017
Pereira, 2010	558	0,358	0,0434 to 1,289
Total (fixed effects)	1853	0,112	0,0143 to 0,395
Total (random effects)	1853	0,124	0,00126 to 0,448

Test for heterogeneity

Q	3,6225
DF	2
Significance level	P = 0,1635
I^2 (inconsistency)	44,79 %
95% CI for I^2	0,00 to 83,59

13) RDC/TMD – Children and adolescents – Disc displacement without reduction with limited opening

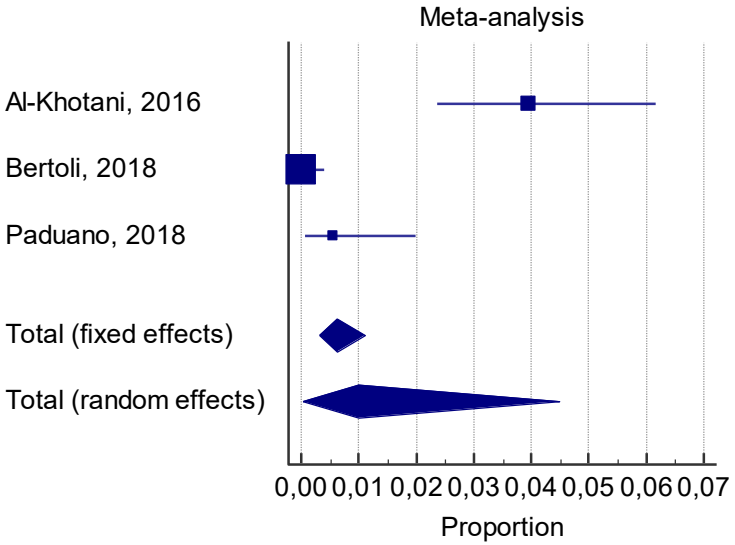


Study	Sample size	Proportion (%)	95% CI
Bertoli, 2018	934	0,000	0,000 to 0,394
Paduano, 2018	361	0,000	0,000 to 1,017
Pereira, 2010	558	0,000	0,000 to 0,659
Total (fixed effects)	1853	0,0390	0,000290 to 0,274
Total (random effects)	1853	0,0390	0,000906 to 0,180

Test for heterogeneity

Q	0,1095
DF	2
Significance level	P = 0,9467
I^2 (inconsistency)	0,00 %
95% CI for I^2	0,00 to 38,72

14) RDC/TMD – Children and adolescents – Overall – Osteoarthritis and osteoarthrosis

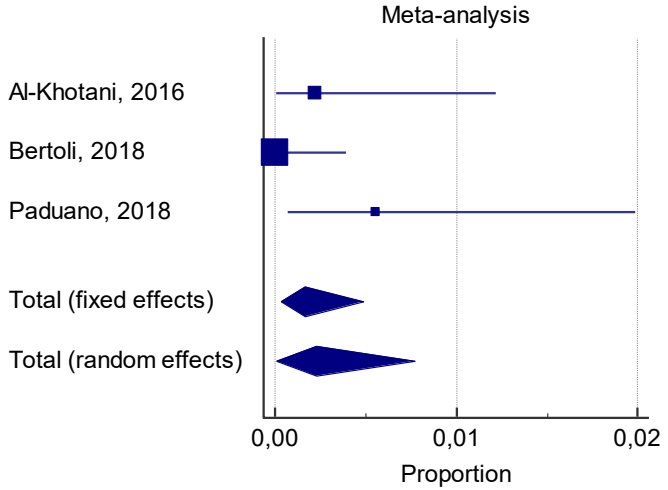


Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	3,947	2,356 to 6,167
Bertoli, 2018	934	0,000	0,000 to 0,394
Paduano, 2018	361	0,554	0,0672 to 1,987
Total (fixed effects)	1751	0,616	0,306 to 1,105
Total (random effects)	1751	0,994	0,0186 to 4,483

Test for heterogeneity

Q	42,6072
DF	2
Significance level	P < 0,0001
I^2 (inconsistency)	95,31 %
95% CI for I^2	89,56 to 97,89

15) RDC/TMD – Children and adolescents – Osteoarthritis

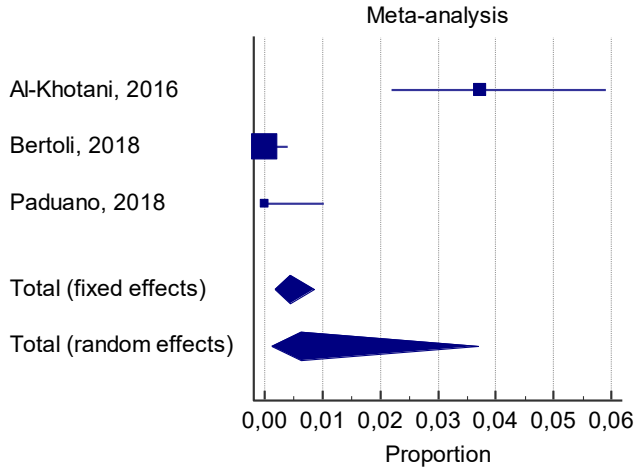


Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	0,219	0,00555 to 1,216
Bertoli, 2018	934	0,000	0,000 to 0,394
Paduano, 2018	361	0,554	0,0672 to 1,987
Total (fixed effects)	1751	0,164	0,0323 to 0,489
Total (random effects)	1751	0,229	0,00650 to 0,767

Test for heterogeneity

Q	5,2367
DF	2
Significance level	P = 0,0729
I^2 (inconsistency)	61,81 %
95% CI for I^2	0,00 to 89,10

16) RDC/TMD – Children and adolescents – Osteoarthrosis



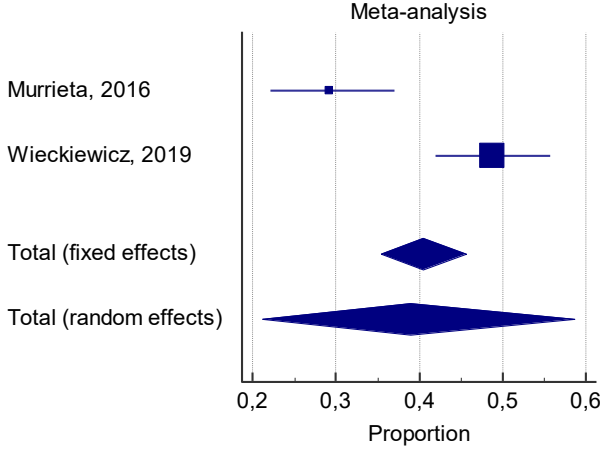
Study	Sample size	Proportion (%)	95% CI
Al-Khotani, 2016	456	3,728	2,186 to 5,902
Bertoli, 2018	934	0,000	0,000 to 0,394
Paduano, 2018	361	0,000	0,000 to 1,017
Total (fixed effects)	1751	0,428	0,179 to 0,859
Total (random effects)	1751	0,631	0,118 to 3,691

Test for heterogeneity

Q	42,8395
DF	2
Significance level	P < 0,0001
I^2 (inconsistency)	95,33 %
95% CI for I^2	89,63 to 97,90

B) Meta-analyses from diagnostic criteria for temporomandibular disorders (DC/TMD):

1) DC/TMD – Adults and elderly – Overall – Any diagnosis

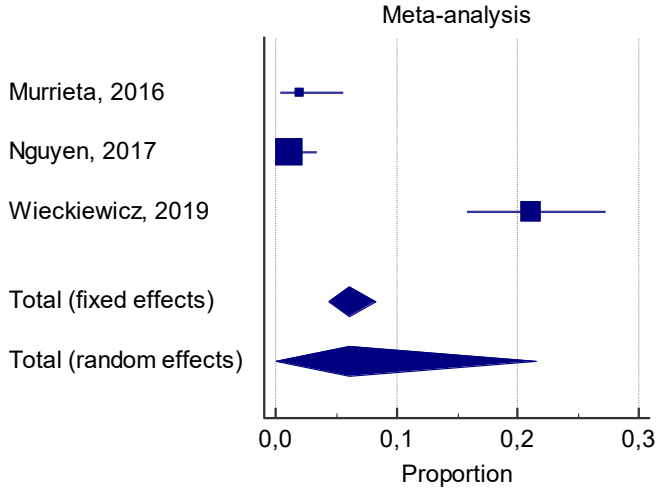


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	29,221	22,179 to 37,082
Wieckiewicz, 2019	213	48,826	41,936 to 55,749
Total (fixed effects)	367	40,442	35,393 to 45,645
Total (random effects)	367	38,976	21,090 to 58,554

Test for heterogeneity

Q	14,5474
DF	1
Significance level	P = 0,0001
I^2 (inconsistency)	93,13 %
95% CI for I^2	77,31 to 97,92

2) DC/TMD – Adults and elderly – Arthralgia

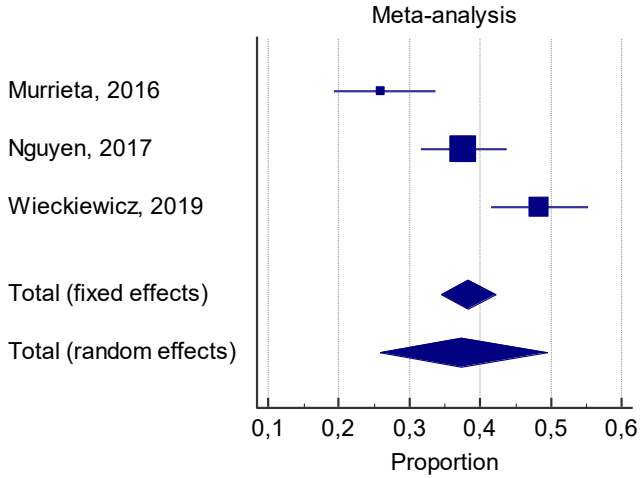


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	1,948	0,404 to 5,587
Nguyen, 2017	258	1,163	0,240 to 3,360
Wieckiewicz, 2019	213	21,127	15,847 to 27,229
Total (fixed effects)	625	6,043	4,310 to 8,202
Total (random effects)	625	6,062	0,0239 to 21,493

Test for heterogeneity

Q	69,6604
DF	2
Significance level	P < 0,0001
I^2 (inconsistency)	97,13 %
95% CI for I^2	94,27 to 98,56

3) DC/TMD – Adults and elderly – Disc Displacements

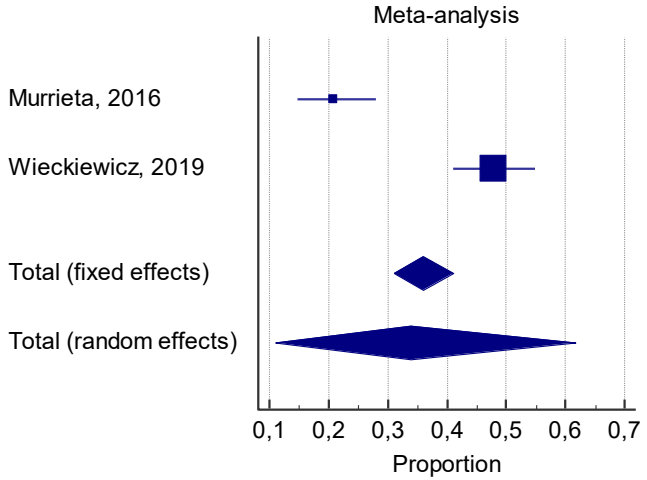


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	25,974	19,250 to 33,647
Nguyen, 2017	258	37,597	31,666 to 43,817
Wieckiewicz, 2019	213	48,357	41,475 to 55,285
Total (fixed effects)	625	38,262	34,444 to 42,191
Total (random effects)	625	37,286	25,845 to 49,499

Test for heterogeneity

Q	19,5092
DF	2
Significance level	P = 0,0001
I^2 (inconsistency)	89,75 %
95% CI for I^2	72,44 to 96,19

4) DC/TMD – Adults and elderly – Disc Displacement with reduction

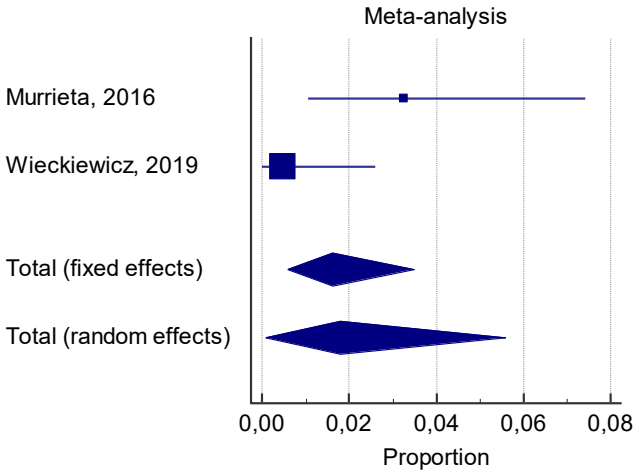


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	20,779	14,668 to 28,049
Wieckiewicz, 2019	213	47,887	41,015 to 54,819
Total (fixed effects)	367	35,959	31,058 to 41,089
Total (random effects)	367	33,833	10,984 to 61,722

Test for heterogeneity

Q	29,9767
DF	1
Significance level	P < 0,0001
I^2 (inconsistency)	96,66 %
95% CI for I^2	91,04 to 98,76

5) DC/TMD – Adults and elderly – Disc Displacement without reduction without limited opening

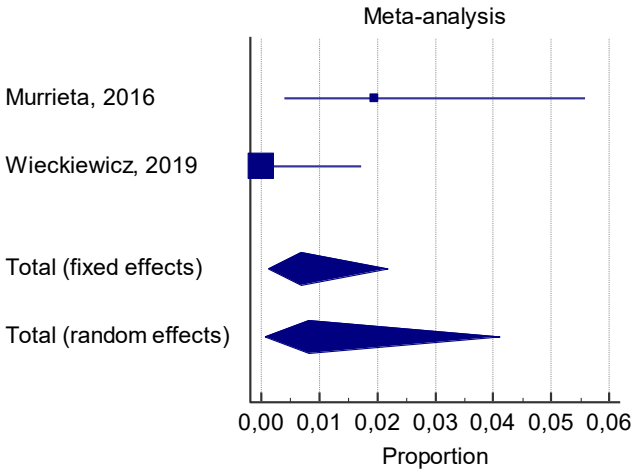


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	3,247	1,062 to 7,414
Wieckiewicz, 2019	213	0,469	0,0119 to 2,588
Total (fixed effects)	367	1,615	0,593 to 3,491
Total (random effects)	367	1,782	0,0864 to 5,575

Test for heterogeneity

Q	4,0932
DF	1
Significance level	P = 0,0431
I^2 (inconsistency)	75,57 %
95% CI for I^2	0,00 to 94,46

6) DC/TMD – Adults and elderly – Disc Displacement without reduction with limited opening

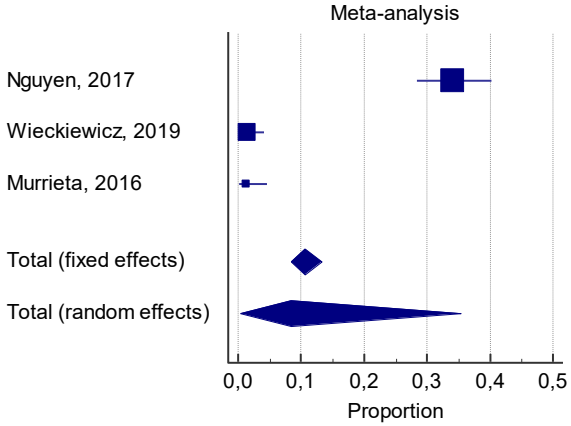


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	1,948	0,404 to 5,587
Wieckiewicz, 2019	213	0,000	0,000 to 1,717
Total (fixed effects)	367	0,688	0,117 to 2,170
Total (random effects)	367	0,815	0,0550 to 4,116

Test for heterogeneity

Q	4,8594
DF	1
Significance level	P = 0,0275
I^2 (inconsistency)	79,42 %
95% CI for I^2	11,09 to 95,24

7) DC/TMD – Adults and elderly – Overall – Degenerative joint disease (osteoarthritis and osteoarthrosis)



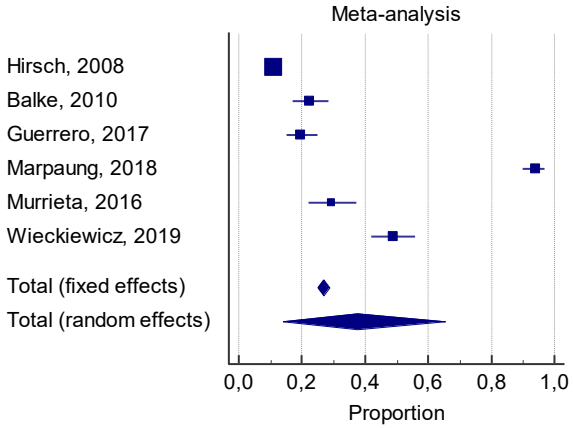
Study	Sample size	Proportion (%)	95% CI
Nguyen, 2017	258	34,109	28,343 to 40,244
Wieckiewicz, 2019	213	1,408	0,291 to 4,061
Murrieta, 2016	154	1,299	0,158 to 4,612
Total (fixed effects)	625	10,645	8,343 to 13,324
Total (random effects)	625	8,369	0,241 to 35,294

Test for heterogeneity

Q	150,3134
DF	2
Significance level	P < 0,0001
I^2 (inconsistency)	98,67 %
95% CI for I^2	97,71 to 99,23

C) Meta-analyses from RDC/TMD and DC/TMD:

1) RDC/TMD and DC/TMD – Adults and elderly – Overall – Any diagnosis

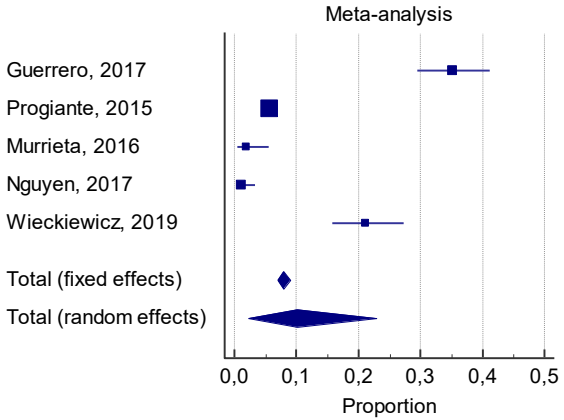


Study	Sample size	Proportion (%)	95% CI
Hirsch, 2008	893	11,198	9,205 to 13,452
Balke, 2010	223	22,422	17,123 to 28,468
Guerrero, 2017	270	19,630	15,063 to 24,876
Marpaung, 2018	204	94,118	89,950 to 96,924
Murrieta, 2016	154	29,221	22,179 to 37,082
Wieckiewicz, 2019	213	48,826	41,936 to 55,749
Total (fixed effects)	1957	26,723	24,776 to 28,740
Total (random effects)	1957	37,622	13,853 to 65,144

Test for heterogeneity

Q	696,9496
DF	5
Significance level	P < 0,0001
I^2 (inconsistency)	99,28 %
95% CI for I^2	99,05 to 99,46

2) RDC/TMD and DC/TMD – Adults and elderly – Arthralgia

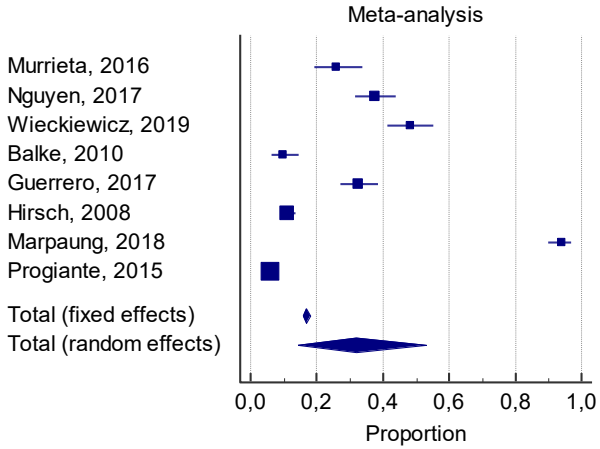


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	35,185	29,495 to 41,205
Progiante, 2015	1643	5,660	4,593 to 6,890
Murrieta, 2016	154	1,948	0,404 to 5,587
Nguyen, 2017	258	1,163	0,240 to 3,360
Wieckiewicz, 2019	213	21,127	15,847 to 27,229
Total (fixed effects)	2538	7,891	6,872 to 9,008
Total (random effects)	2538	10,170	2,248 to 22,871

Test for heterogeneity

Q	219,0941
DF	4
Significance level	P < 0,0001
I^2 (inconsistency)	98,17 %
95% CI for I^2	97,20 to 98,81

3) RDC/TMD and DC/TMD – Adults and elderly – Disc displacements

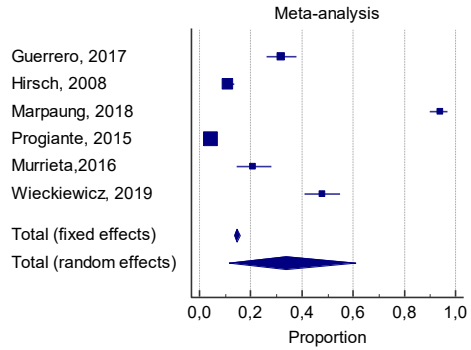


Study	Sample size	Proportion (%)	95% CI
Murrieta, 2016	154	25,974	19,250 to 33,647
Nguyen, 2017	258	37,597	31,666 to 43,817
Wieckiewicz, 2019	213	48,357	41,475 to 55,285
Balke, 2010	223	9,865	6,286 to 14,555
Guerrero, 2017	270	32,593	27,035 to 38,537
Hirsch, 2008	893	11,198	9,205 to 13,452
Marpaung, 2018	204	94,118	89,950 to 96,924
Progiante, 2015	1643	5,843	4,758 to 7,089
Total (fixed effects)	3858	16,840	15,673 to 18,057
Total (random effects)	3858	31,866	14,068 to 52,975

Test for heterogeneity

Q	1109,5066
DF	7
Significance level	P < 0,0001
I^2 (inconsistency)	99,37 %
95% CI for I^2	99,21 to 99,50

4) RDC/TMD and DC/TMD – Adults and elderly – Disc Displacement with reduction

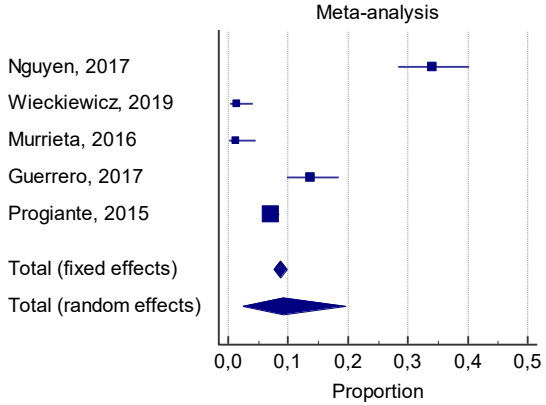


Study	Sample size	Proportion (%)	95% CI
Guerrero, 2017	270	31,852	26,336 to 37,771
Hirsch, 2008	893	11,198	9,205 to 13,452
Marpaung, 2018	204	94,118	89,950 to 96,924
Progiante, 2015	1643	4,443	3,499 to 5,554
Murrieta,2016	154	20,779	14,668 to 28,049
Wieckiewicz, 2019	213	47,887	41,015 to 54,819
Total (fixed effects)	3377	14,609	13,435 to 15,845
Total (random effects)	3377	33,624	11,205 to 60,949

Test for heterogeneity

Q	1097,8547
DF	5
Significance level	P < 0,0001
I^2 (inconsistency)	99,54 %
95% CI for I^2	99,42 to 99,64

5) RDC/TMD and DC/TMD – Adults and elderly – Degenerative joint disease (osteoarthritis and osteoarthrosis)



Study	Sample size	Proportion (%)	95% CI
Nguyen, 2017	258	34,109	28,343 to 40,244
Wieckiewicz, 2019	213	1,408	0,291 to 4,061
Murrieta, 2016	154	1,299	0,158 to 4,612
Guerrero, 2017	270	13,704	9,836 to 18,391
Progiante, 2015	1643	7,121	5,925 to 8,473
Total (fixed effects)	2538	8,601	7,540 to 9,759
Total (random effects)	2538	9,131	2,397 to 19,589

Test for heterogeneity

Q	165,6938
DF	4
Significance level	P < 0,0001
I^2 (inconsistency)	97,59 %
95% CI for I^2	96,14 to 98,49