

THIAGO CÉSAR DA SILVA LIMA

**PREVALÊNCIA DE LESÕES TRAUMÁTICAS DENTOALVEOLARES
EM SERVIÇOS ODONTOLÓGICOS DE URGÊNCIA: *REVISÃO
SISTEMÁTICA E META-ANÁLISE***

**Faculdade de Odontologia
Universidade Federal de Minas Gerais
Belo Horizonte
2021**

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Dissertação apresentada ao colegiado de Pós-Graduação em Odontologia da Faculdade de Odontologia da Universidade Federal de Minas Gerais, como requisito parcial à obtenção do grau de Mestre em Odontologia – área de concentração em Endodontia.

Orientadora: Prof.^a Dr.^a Juliana Vilela Bastos
Coorientador: Prof. Dr. Antônio Paulino Ribeiro Sobrinho

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**Prevalência de lesões traumáticas dento alveolares em serviços odontológicos de urgência:
revisão sistemática e meta-análise**

THIAGO CÉSAR DA SILVA LIMA

Dissertação submetida à Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação em Odontologia, como requisito para obtenção do grau de Mestre, área de concentração Endodontia.

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“In a dark place we find ourselves, and a little more knowledge lights our way.”

Yoda

RESUMO

As lesões traumáticas dentoalveolares (LTDA) consistem em lesões de natureza múltipla e aguda decorrentes de impactos abruptos sobre os dentes e suas estruturas de suporte. Em todo o mundo, estas lesões têm uma alta prevalência relatada e representam grande parte da procura por serviços de emergência odontológicos. No entanto, informações sobre a prevalência de LTDA dentro dos serviços odontológicos emergenciais ainda são dispersas e fragmentadas. Este estudo objetivou revisar a literatura de forma sistemática e sintetizar as informações disponíveis sobre esta prevalência através de meta-análise, conforme descrito no protocolo registrado no PROSPERO sob o código CRD42021243537. A busca bibliográfica foi realizada em sete principais bases de dados em saúde: PubMed; Embase; LILACS; LIVIVO; ScienceDirect; Scopus e Web of Science. E outras duas bases da literatura cinzenta: Google Acadêmico e OpenGrey. A partir da estratégia PICOS, a seguinte pergunta específica para a revisão foi definida: “Qual a prevalência de LTDA nos serviços odontológicos de urgência?”. Foram incluídos estudos que apresentaram a prevalência de LTDA em serviços odontológicos emergenciais, publicados em alfabeto latino-romano. Foram excluídos resumos, revisões, relatos-de-caso, protocolos, opiniões de especialistas, cartas, pôsteres e publicações nas quais a versão do texto completo não pôde ser acessada. Estudos conduzidos em clínicas especializadas em traumatismos dentários e em condições extremas, tais como cenários de guerra e desastres ambientais, também foram excluídos. De 2464 estudos identificados pela busca bibliográfica, 1476 restaram após a exclusão de duplicatas. Destes, 1329 foram excluídos pela leitura do título e resumo. Dos 147 estudos remanescentes, 38 foram selecionados após a leitura do texto completo e outros 5 trabalhos foram incluídos através da busca manual pelas referências das publicações selecionadas. O ano de publicação dos 43 estudos variou de 1984 a 2021. A maioria dos trabalhos (30) apresentou risco de viés moderado de acordo com o checklist para estudos de prevalência do Joanna Briggs Institute. Foram observadas prevalências que variaram de 1,9% a 69,1% sendo que a prevalência global, para os 43 estudos incluídos, foi de 15,4% (11%-21%, $i^2=100\%$, IC:95%). Quando considerada a análise de subgrupos, a prevalência foi de 24% (15%-35%, $I^2 = 100\%$, IC:95%) para os estudos que avaliaram a faixa etária entre 0 e 21. A mesma prevalência de 29% (22%-38%, $I^2=99.5\%$, IC:95%) foi observada para os estudos conduzidos em serviços odontopediátricos de urgência. Considerando-se que o atendimento emergencial é determinante do prognóstico das LTDA em longo prazo, o conhecimento da prevalência destas lesões entre as emergências odontológicas é fundamental para organizar estes serviços e subsidiar políticas públicas nesta área.

Palavras-chave: Traumatismos dentários. Prevalência. Emergências. Revisão sistemática. Meta-análise.

ABSTRACT

Prevalence of traumatic dental injuries in dental emergency services: a systematic review and meta-analysis

Traumatic dental injuries (TDI) consist of multiple and acute injuries resulting from abrupt impacts on teeth and their supporting structures. These injuries have a high prevalence reported worldwide and represent a large part of the demand for emergency dental services. However, information on the TDI prevalence rate within emergency dental services is still scattered and fragmented. This study aimed to systematically review the literature and synthesize the information available on this prevalence through meta-analysis, as described in the protocol registered in PROSPERO under code CRD42021243537. A bibliographic search was performed in seven health databases: PubMed; Embase; LILACS; LIVIVO; ScienceDirect; Scopus; and Web of Science. And two other grey literature bases: Google Scholar and OpenGrey. Based on the PICOS strategy, the following specific question for the review was defined: What is the prevalence of TDI in emergency dental services? Studies showing the TDI prevalence rate in emergency dental services, published in the Latin-Roman alphabet, were included. Abstracts, reviews, case reports, protocols, expert opinions, letters, posters, and publications in which the full-text version could not be accessed were excluded. Studies conducted in clinics specializing in dental trauma and in extreme conditions, such as war scenarios and environmental disasters, were also excluded. Of 2464 studies identified by the literature search, 1476 remained after excluding duplicates. Of these, 1329 were excluded by reading the title and abstract. Of the remaining 147 studies, 38 were selected after reading the full text and another 5 works were included through a manual search for the references of the selected publications. The year of publication of the 43 studies ranged from 1984 to 2021. Most studies (30) had a moderate risk of bias according to the Joanna Briggs Institute's checklist for prevalence studies. Prevalence rates ranging from 2% to 69% were observed and the overall prevalence, for the 43 studies included, was 15.4% (11%-21%, $I^2=100%$, CI:95 %). For subgroup analysis, the prevalence of 24% (15%-35%, $I^2=100%$, CI: 95%) was observed for studies that evaluated the age group between 0 and 21. A prevalence of 29% (22%-38%, $I^2=99%$, CI: 95%) was observed for studies conducted in emergency paediatric dental services. Considering that emergency care is a determinant of TDI's long-term prognosis, knowledge of the prevalence of these injuries among dental emergencies is essential to organize these services and support public policies in this area.

Keywords: Tooth injuries. Prevalence. Emergencies. Systematic review. Meta-analysis.

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LISTA DE ABREVIATURAS E SIGLAS

GRADE	Do inglês, 10, <i>Grades of Recommendation, Assessment, Development, and Evaluation</i>
LTDA	Lesões traumáticas dentoalveolares
MOOSE	Meta-análise de Estudos Observacionais em Epidemiologia. Do inglês, <i>Meta-analysis of Observational Studies in Epidemiology</i>
OMS	Organização Mundial da Saúde
PRISMA	Itens Preferenciais para o relato de Revisões Sistemáticas e Meta-análises. Do inglês, <i>Preferred Reporting Items for Systematic reviews and Meta-Analyses</i>
PROSPERO	Registro Internacionais Prospectivo de Revisões Sistemáticas. Do inglês, <i>Prospective International Registry of Systematic Reviews</i>
TDI	Lesões traumáticas dentoalveolares. Do inglês, <i>Traumatic dental injuries.</i>
WHO	Organização Mundial da Saúde. Do inglês, <i>World Health Organization.</i>

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1 CONSIDERAÇÕES INICIAIS

As urgências odontológicas podem ser definidas como situações em que quadros dolorosos ou de mal estar interferem no funcionamento do aparelho estomatognático. Embora não representem risco de vida para o paciente, apresentam um alto impacto na vida cotidiana (CONSELHO FEDERAL DE ODONTOLOGIA, 2021).

Os quadros agudos infecciosos de origem odontogênica, os traumatismos buco-maxilo-faciais e alvéolo dentários, as disfunções de articulação temporomandibular, problemas relacionados à esfoliação de dentes decíduos e erupção dos permanentes e lesões de mucosa de origem não traumática representam as causas mais comuns de procura dos serviços de urgência odontológica (AGOSTINI; FLAITZ; HICKS, 2001).

Lesões traumáticas dentoalveolares (LTDA) resultam de impactos repentinos, abruptos e imprevisíveis na região oral, atingindo principalmente os dentes anteriores e suas estruturas de suporte. Embora a região oral compreenda uma área de aproximadamente 1% da área total do corpo, as lesões orais são responsáveis por 5% de todas as lesões corporais em todas as idades, e em crianças em idade pré-escolar a proporção chega a 17%. Além disso, estas lesões apresentam alta prevalência e incidência relatadas ao redor do mundo, estimando-se que cerca de um bilhão de pessoas atualmente já sofreram traumatismos dentários (PETERSSON; ANDERSSON; SÖRENSEN, 1997; PETTI; GLENDOR; ANDERSSON, 2018).

As LTDA são lesões múltiplas que podem ser divididas em 8 diferentes fraturas e 6 tipos de luxação. E ainda são frequentes as lesões concomitantes nas quais tanto a luxação quanto a fratura ocorrem simultaneamente, possibilitando a existência de 48 cenários de LTDA. Sendo assim, a evolução das LTDA depende não só do potencial de reparo individual dos tecidos envolvidos, mas também de sua interação o que, não raro, determina padrões complexos e variados de cicatrização (ANDREASEN; ANDREASEN; ANDERSSON, 2018).

Aliado à alta prevalência e à complexidade das sequelas para o aparelho estomatognático encontra-se o alto impacto psicossocial causado pelo

comprometimento estético dos incisivos superiores, dentes mais afetados. Estudos comprovaram que o efeito sobre a aparência da face, embora quase sempre subestimado, tem um grande impacto no desenvolvimento biopsíquico e emocional de crianças e adolescentes. Sendo assim, a pronta reabilitação estética e funcional torna-se fundamental para garantir a reinserção destes pacientes ao seu convívio social e desenvolvimento normais (CORTES et al., 2002, RODD & NOBLE, 2019). Entretanto, a possibilidade de completa reconstituição estética e funcional é limitada nos pacientes mais jovens, uma vez que ainda se encontram em fase de crescimento dos maxilares, demandando intervenções provisórias até que o paciente atinja a idade ideal para a sua completa reabilitação (LIDDELOW; CARMICHAEL, 2016).

Devido à sua natureza aguda, as LTDA devem ser consideradas como urgência representando uma das causas mais comuns de procura dos serviços de pronto atendimento (MARTENS et al., 2018; SAKAI et al., 2005). Sabe-se que a abordagem inicial do paciente portador de LTDA tem papel decisivo no sucesso do tratamento destas lesões. Cuidados imediatos que antecedem a atuação do dentista e as condutas clínicas adotadas no atendimento emergencial podem influenciar diretamente o prognóstico destas lesões em longo prazo (BARRET; KENNY, 1997; DEWHURST; MASON; ROBERTS, 1998).

Todas estas características delineiam um problema de tratamento complexo e de alto custo, pois, aos gastos com o tratamento inicial, se soma a necessidade de um acompanhamento e tratamento multidisciplinar em longo prazo para tratamento das sequelas (GLENDOR et. al., 2001). Não obstante, as LTDA permanecem como um sério e negligenciado problema de saúde pública, pois, apesar de conhecermos suas causas, programas de prevenção e controle ainda têm sido realizados de forma isolada e pontual, e ainda não existem políticas públicas específicas voltadas para as LTDA (PETTI et. al., 2018; SIGURDSSON, 2013). Além disso, apesar de existirem protocolos estabelecidos para o tratamento das LTDA (BOURGUIGNON et al., 2020; DAY et al., 2020; FOUAD et al., 2020; LEVIN et al., 2020), o mesmo ainda é negligenciado, representando um desafio mesmo em países desenvolvidos. Segundo Alnaggar e Andersson (2014), a questão central está mais relacionada à disponibilidade, organização e gestão dos serviços de urgência odontológicas do que à condição econômica ou concentração de especialistas. Não estando habituado a situações de urgência numa área que está fora da sua prática rotineira, o clínico se

baseia em suas raras experiências prévias para solucioná-las, o que enfatiza a necessidade de formação profissional de clínicos gerais para atuar nesta área, bem como a disponibilidade de especialistas preparados para lidar com lesões mais complexas (ALNAGGAR; ANDERSSON, 2014). Conhecer a real demanda que as LTDA representam dentre as urgências odontológicas representa um primeiro passo para avançar na organização da linha de cuidado deste agravo, uma vez que subsidia a formulação de políticas públicas de saúde bucal, a organização da rede, bem como a alocação de recursos humanos e financeiros. Paradoxalmente, verifica-se que o conhecimento disponível nesta área ainda é fragmentado e disperso. Sendo assim, este estudo objetivou realizar uma revisão sistemática e meta-análise para responder à seguinte questão: “Qual a prevalência de lesões traumáticas dentoalveolares em serviços odontológicos de urgência?”.

2 OBJETIVOS

2.1 Objetivo geral

Revisar a literatura de forma sistemática acerca da prevalência de lesões traumáticas dentoalveolares diagnosticada entre pacientes que procuraram por serviços odontológicos de urgência.

2.2 Objetivos específicos

a) Analisar a distribuição das LTDA nos serviços odontológicos de urgência de acordo com a classificação das lesões;

b) Analisar a prevalência das LTDA por tipo de serviço odontológico de urgência;

c) Analisar a prevalência das LTDA nos serviços odontológicos de urgência de acordo com as faixas etárias;

d) Analisar a prevalência das LTDA nos serviços odontológicos de urgência de em diferentes regiões de acordo com a divisão da Organização Mundial de Saúde.

3 METODOLOGIA EXPANDIDA

3.1 Delineamento da revisão

Para a realização deste estudo foi preparado um protocolo registrado no Registro Internacional Prospectivo de Revisões Sistemáticas (PROSPERO), sob o código CRD42021243537.

Para organizar e relatar todas as etapas da pesquisa foram utilizados dois *checklists*:

- a) *Preferred Reporting Items for Systematic reviews and Meta-Analyses* (PRISMA) (PAGE *et al.*, 2021);
- b) *Meta-analysis of Observational Studies in Epidemiology* (MOOSE) (BROOKE; SCHWARTZ; PAWLIK, 2021).

A pergunta específica para a revisão foi desenvolvida a partir da estratégia PICOS (*Population, Intervention, Comparison, Outcomes, Studies*), formulada da seguinte maneira:

- a) P – População: Pacientes que procuraram por serviços odontológicos de urgência;
- b) I – Intervenção: Lesões traumáticas dentoalveolares;
- c) C – Comparação: Não se aplica;
- d) O – Desfecho: Prevalência de lesões traumáticas dentoalveolares;
- e) S – Tipos de estudo: Estudos observacionais.

Por fim, a seguinte questão foi definida: 'Qual a prevalência de lesões traumáticas dentoalveolares nos serviços odontológicos de urgência?'.

3.2 Critérios de elegibilidade

3.2.1 Critérios de inclusão

Para a inclusão, todos os estudos deveriam atender a todos os seguintes critérios:

- a) Ter sido conduzido em instituições que prestem serviços odontológicos emergenciais;

A natureza emergencial do serviço, bem como o atendimento prestado por dentistas deveria estar relatado no texto.

- b) Apresentar a proporção de diagnóstico ou prevalência de lesões traumáticas dentoalveolares dentro da amostra de pacientes que procuraram por atendimento emergencial;
- c) Estar publicado em alfabeto latino-romano.

3.2.2 Critérios de exclusão

Foram excluídos todos os estudos que respondiam positivamente a um ou mais dos seguintes critérios:

- a) Ser conduzido em clínica ou serviço especializado em traumatismos dentários;
- b) Ser conduzido em ambiente hostil – favorável a traumatismos, como cenários bélicos, hospitais de campanha, serviços militares e tragédias ambientais;
- c) O período de prevalência dos estudos ter acontecido durante a fase de isolamento da pandemia de COVID-19.
- d) Resumos;
- e) Relatos e séries-de-caso;
- f) Protocolos;
- g) Opiniões de especialistas;
- h) Cartas;
- i) Pôsteres;
- j) Publicação com o texto completo indisponível/inacessível.

3.3 Busca bibliográfica

A busca bibliográfica foi realizada em sete principais bases de dados em saúde: PubMed; Embase; LILACS; LIVIVO; ScienceDirect; Scopus e Web of Science. E outras duas bases da literatura cinzenta: Google Acadêmico e OpenGrey. A estratégia

de busca foi, inicialmente, desenvolvida na base PudMed e então adaptada para as outras bases, de acordo com seus critérios de busca e operadores.

A estratégia foi validada por dois revisores, T.C.S.L. e S.C.C., de forma que esta apresentasse um grupo de estudos previamente definidos por uma busca exploratória que obedecia aos critérios de elegibilidade idealizados no protocolo. As buscas foram então executadas de forma independente pelos revisores e o número de publicações obtidas verificado. Todas as publicações identificadas em cada uma das bases foram incluídas, exceto as publicações encontradas no Google Acadêmico, onde foram selecionados os 200 primeiros resultados devido à desconexão com o tema dos resultados seguintes. Uma descrição completa de todas as chaves e a última data de busca de cada uma delas nas bases podem ser observadas nos Quadros 1-9.

Além disso, uma busca manual pelas referências dos estudos incluídos foi realizada com o objetivo de identificar publicações adicionais. Para organização, gerenciamento e exclusão das duplicatas das referências identificadas, foram utilizados dois softwares: Zotero Research Assistant e Rayyan Intelligent Systematic Review.

Quadro 1 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados PubMed

(prevalence[MeSH terms] OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injuries"[MeSH terms] OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dentoalveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergency[MeSH terms] OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")

Total de publicações: 399

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 2 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados Embase

#1 ('prevalence'/exp OR 'prevalence' OR 'incidence'/exp OR 'incidence' OR 'frequency'/exp OR 'frequency' OR 'occurrence' OR 'proportion' OR 'epidemiology'/exp OR 'epidemiology')

#2 ('tooth injury'/exp OR 'tooth injury')

#3 ('emergency'/exp OR 'emergency')

#4 (#1 AND #2 AND #3)

Total de publicações: 420

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência;
Item #4: comando para combinação dos itens #1, #2 e #3.

Fonte: Dados da pesquisa, 2021.

Quadro 3 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados LILACS

(prevalence OR incidence) AND ("tooth injuries") AND (emergency OR emergencies)

Total de publicações: 32

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 4 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados LIVIVO

(prevalence[MeSH terms] OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injuries"[MeSH terms] OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dentoalveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergency[MeSH terms] OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")

Total de publicações: 125

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 5 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados ScienceDirect

(prevalence OR incidence OR frequency) AND ("tooth injuries" OR "traumatic dental injuries" OR "dentoalveolar trauma") AND ("emergency" OR "urgency" OR "health service")

Total de publicações: 329

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 6 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados Web of Science

#1 TS=(prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology)

#2 TS=("tooth injur*" OR "traumatic dental injur*" OR "maxillo\$facial trauma" OR "maxillo\$facial injur*" OR "maxillo\$facial fracture" OR "oro\$facial trauma" OR "oro\$facial injur*" OR "dental trauma" OR "dental injur*" OR "dental fracture" OR "dento\$facial trauma" OR "dento\$facial injur*" OR "dento\$facial fracture" OR "dento\$alveolar trauma" OR "dento\$alveolar injur*" OR "dento\$alveolar fracture")

#3 TS=(emergenc* OR urgenc* OR "health service*")

#4 #1 AND #2 AND #3

Total de publicações: 389

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência;
Item #4: comando para combinação dos itens #1, #2 e #3.

Fonte: Dados da pesquisa, 2021.

Quadro 7 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados SCOPUS

(TITLE-ABS-KEY((prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology OR epidemiologic))) AND TITLE-ABS-KEY(("tooth injur*" OR "traumatic dental injur*" OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*")) AND TITLE-ABS-KEY(("emergenc*" OR "urgenc*" OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*"))

Total de publicações: 569

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 8 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados Google Acadêmico

prevalence (prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology OR epidemiologic) AND trauma ("tooth injuries" OR "tooth injury" OR "traumatic dental injuries" OR "traumatic dental injury" OR "dental injuries" OR "dental injury" OR "dental trauma" OR "dental fractures" OR "dental fracture" OR "dentoalveolar trauma" OR "dentoalveolar injuries" OR "dentoalveolar injury" OR "dentoalveolar fractures" OR "dentoalveolar fracture") AND emergency (emergency OR urgency OR "emergency service" OR "emergency department" OR "dental emergency" OR "medical emergency service" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit" OR "emergency center" OR "emergicenter" OR "emergency health service" OR "health service")

Total de publicações: 200/1770

Última busca em: dezembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
Em **verde**: parte da chave de busca referente aos traumatismos dentários;
Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

Quadro 9 – Chaves de busca, total de publicações identificadas e data da última consulta à base de dados OpenGrey

(prevalence OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injur*" OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergenc* OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")	
Total de publicações: 1	Última busca em: novembro/2021

Em **amarelo**: parte da chave de busca referente aos estudos de prevalência;
 Em **verde**: parte da chave de busca referente aos traumatismos dentários;
 Em **azul**: parte da chave de busca referente aos serviços de urgência.

Fonte: Dados da pesquisa, 2021.

3.4 Identificação e seleção das publicações

Na primeira fase de seleção, realizou-se a leitura de título e resumo de todos os estudos identificados pela busca. Os artigos foram avaliados por dois revisores, de modo independente e, no caso de discordâncias, um terceiro revisor foi envolvido para a decisão final. Na segunda fase, fez-se a leitura completa dos artigos considerados elegíveis. Do mesmo modo, dois revisores trabalharam de forma independente e um terceiro revisor auxiliou na resolução das divergências.

3.5 Coleta de dados

Os seguintes dados foram coletados de forma independente por dois revisores:

- características do estudo (autor, país, idioma e ano de publicação, duração e tipo de serviço emergencial);
- características da amostra de pacientes de emergência (tamanho da amostra, distribuição por sexo, dados de idade);

- c) características de amostra de pacientes portadores de LTDA (tamanho da amostra, distribuição por sexo, dados de idade, dados de dentição);
- d) medidas de desfecho dos estudos (prevalência das lesões traumáticas, número de dentes traumatizados, frequência de tipo de lesão traumática).

As informações obtidas foram checadas e, um terceiro revisor participou da resolução de conflitos.

3.6 Avaliação do risco de viés

O risco de viés individual dos estudos incluídos foi avaliado através do protocolo do *Joanna Briggs Institute*, uma ferramenta de avaliação crítica desenvolvida para auxiliar a mensuração da confiabilidade, relevância e possíveis vieses em resultados de artigos publicados ("Critical Appraisal Tools | Joanna Briggs Institute", 2021). No caso desta revisão, que avaliou o dado de prevalência apresentado pelas publicações incluídas, foi selecionado o checklist para estudos de prevalência que consiste em nove questões estruturadas em três domínios principais: Amostragem / definição dos participantes (questões 1, 2, 4 e 9), medição da condição (questões 6 e 7) e estatísticas (3, 5 e 8). Para cada pergunta, quatro opções de resposta padrão estão disponíveis: sim, não, pouco claro e não aplicável. Para ser classificado como um "baixo risco de viés" ou pesquisa de alta qualidade, um estudo deveria demonstrar uma metodologia apropriada em todos os três domínios, de acordo com Righy e colaboradores (2019).

Previamente à aplicação do checklist, foi realizada uma calibração inicial dos dois revisores quanto aos critérios de avaliação para cada uma das nove questões apresentadas no Anexo A.

Para a questão 1, relacionada à adequação da amostra para a população-alvo, receberam resposta "sim" aqueles estudos que trabalharam com censos, listas de registros, e bancos de prontuários. Além disso, estudos que incluíram dentes permanentes e decíduos como também população com a faixa etária de 0 a 19 anos receberam "sim". Responderam como "não" à questão aqueles estudos que trabalharam somente com amostras que compartilhavam características específicas como: pacientes acima de 25 anos (fora da faixa etária de risco para LTDA); somente

dentes decíduos; somente dentes permanentes; pacientes portadores de comorbidades que impactassem a prevalência de LTDA; pacientes com atividades, profissões ou práticas esportivas de risco. Estudos que não apresentaram a idade dos pacientes que buscaram pelo serviço de urgência obtiveram a resposta “não está claro”.

A questão 2, referente ao recrutamento de participantes para o estudo, foi desconsiderada para esta revisão. Uma vez que os estudos eram compostos por pacientes que buscaram serviços emergenciais, sendo assim todos os estudos eram compostos por uma seleção aleatória da população.

Em relação ao tamanho das amostras, questão 3, responderam como “sim” os estudos que apresentaram pesquisas a níveis nacionais e estudos que realizaram cálculo amostral. Para os demais estudos, foi feito um cálculo amostral para a amostra de pacientes que buscaram o serviço de urgência, como sugerido no Anexo A. Estudos com a amostra inferior a 290 pacientes receberam a resposta “não”.

Na questão número 4, foram observados os dados demográficos idade e sexo. Somente os estudos que apresentaram a informação de idade da amostra receberam resposta “sim”. Para a quinta questão, receberam a resposta “não” os estudos que afirmaram ou demonstraram alguma subnotificação das LTDA, os que as descreveram de forma dispersa e/ou acrescentada de outros diagnósticos, e os estudos que relataram somente um tipo de LTDA.

Responderam como “sim” à questão 6 os estudos prospectivos que descreveram os critérios de diagnóstico de LTDA e à questão 7 os que realizaram calibração dos pesquisadores e/ou profissionais que atenderam os pacientes. Estudos que não atenderam estes critérios responderam como “não está claro” à estas duas questões.

Para a questão 8, responderam como “sim” os estudos com a proporção de prevalência de LTDA bem descrita. Estudos com este dado disperso ou apresentado de forma secundária, que exigiu algum cálculo por parte dos revisores responderam como “não”. À nona questão responderam como “sim” os estudos que não apresentaram dados perdidos e os que explicaram seus dados perdidos. Estudos que não os explicaram responderam como “não”.

3.7 Análise dos dados

A prevalência de lesões traumáticas dentoalveolares foi expressa por meio de frequências relativas ou absolutas e seus intervalos de confiança de 95%. Uma meta-análise de proporção foi realizada para avaliar a prevalência global combinada de lesões traumáticas dentoalveolares nos serviços odontológicos emergenciais.

A heterogeneidade dos estudos foi quantificada estatisticamente através do teste Q de Cochran e da estatística I^2 , um valor $>50\%$ para o teste I^2 foi considerado como indicador de heterogeneidade. Neste caso, o modelo de efeitos aleatórios foi escolhido para a meta-análise.

Para diferentes grupamentos de estudos, foi efetuada uma análise de subgrupos, compreendida por: região onde a pesquisa foi conduzida, de acordo com as regiões da Organização Mundial da Saúde; países onde as publicações foram mais frequentes; tipo de serviço emergencial; faixa-etária mais acometida por traumatismos dentários; estudos publicados de 2010 em diante; estudos que coletaram dados de prevalência durante 12 meses ou mais; e risco de viés individual dos estudos.

Os resultados da revisão de literatura também foram analisados de forma descritiva. O software IBM® SPSS Statistics, versão 25, foi utilizado para a análise descritiva dos resultados e o software R, versão 4.1.0, foi utilizado para toda a meta-análise e construção dos gráficos.

4 ARTIGO CIENTÍFICO

O seguinte artigo científico foi preparado e formatado de acordo com as regras estabelecidas pelo periódico onde será submetido para publicação, Community Dentistry and Oral Epidemiology.

TITLE PAGE

Title: Prevalence of traumatic dental injuries in emergency dental services: systematic review and meta-analysis

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Data availability statement: The following elements will be made available upon request: template data collection forms, data extracted from included studies, data used for all analyses and the analytic code. Contact info: Mr. Thiago Lima, tgocsr@gmail.com.

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ABSTRACT

Objectives: This study aimed to perform a systematic review and meta-analysis regarding the prevalence of traumatic dental injuries (TDI) in emergency dental services.

Methods: Seven electronic and two grey literature databases were searched, up to December 2021, for studies that reported the TDI prevalence among dental emergencies. The Joanna Briggs Institute critical appraisal checklist for prevalence studies, and The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach, were used to assess the risk of bias and quality of evidence, respectively. The R software was used to perform a proportion meta-analysis on a random-effects model to estimate the pooled prevalence and respective 95% CI.

Results: From a total of 1476 studies identified after excluding duplicates, 38 met the inclusion criteria, and another five were identified through hand searching, summing 43 included observational studies with a total sample of 209099 individuals searching for emergency dental care. The overall pooled prevalence of TDI was 15.4% (95% CI: 11%-21%, $I^2 = 100\%$). Paediatric dental emergency services and age group from 0 to 21 years presented the highest prevalence, 29% (95% CI: 22%-38%, $I^2 = 99.5\%$) and 24% (95% CI: 15%-35%, $I^2 = 100\%$), respectively.

Conclusions: The overall pooled prevalence of TDI in emergency dental services was 15.4%, and 24% in the age group under 21 years. Considering the impact of prompt and correct emergency care in the long-term prognosis of TDI, such knowledge is relevant to organize emergency healthcare and support public policies in this area.

KEYWORDS

Tooth Injuries, Prevalence, Emergency Medical Services, Systematic review, Meta-analysis.

MAIN TEXT

INTRODUCTION

Traumatic dental injuries (TDI) have a high prevalence and incidence reported worldwide, affecting both the primary and the permanent dentitions, and were projected as the second most frequent oral disease and the fifth world's most prevalent disease/injury in a systematic review¹.

TDI results from abrupt impacts, primarily to anterior teeth and supportive structures, with direct functional, aesthetics, and psychosocial shortcomings². Due to their acute nature, TDIs also account for a large proportion of all oral-related emergency demands^{2,3} posing a clinical challenge since timely and correct emergency care are crucial to improve the prognosis and lessen the problems ahead of all trauma victims^{5,6,7}.

Nevertheless, despite well-established protocols^{8,9,10,11}, TDI is still a neglected condition even in developed countries. It has been shown that there are problems regarding the availability, organization, and management of emergency services for the treatment of TDI¹².

Current information regarding the prevalence of TDI within emergency services is still scattered and, to date, no systematic review has been carried out to summarize and critically appraise the available evidence regarding such prevalence. Knowledge of the prevalence of TDI within emergency dental services represents the first step to support the formulation of public policies to address this condition, aiming at the proper organization of emergency and first-aid services as well as the allocation of human and financial resources.

Therefore, the present study aimed to answer the following question: "What is the prevalence of traumatic dental injuries in emergency dental services?"

METHODS

This study was registered in the Prospective International Registry of Systematic Reviews (PROSPERO) under code CRD42021243537. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)¹³ and Meta-analysis of

Observational Studies in Epidemiology (MOOSE)^{14,15} checklists were used to organize and report all stages of the research.

The question "What is the prevalence of traumatic dental injuries among patients who seek treatment at emergency dental services?" was structured following the PICO strategy as follows: P – (Population) Patients who sought emergency dental services with no restrictions; I (Intervention) Traumatic dental injuries; C (Comparison) Not applicable; O (Outcome) Prevalence of traumatic injuries.

Electronic searches were carried out in PubMed; Embase; LILACS; LIVIVO; ScienceDirect; Scopus; Web of Science; and two grey literature databases: Google Scholar and OpenGrey. The complete search strategies are presented in Supplementary File 1. For Google Scholar, only the first 200 results were selected due to the lack of consistency with the theme from the fifth page (100th publication). In addition, a manual search was performed in the bibliography of the included studies. Two software were used to organize, manage, and exclude duplicates of the identified publications: Zotero Research Assistant and Rayyan Intelligent Systematic Review¹⁶. Performed searches were rerun during the final drafting of the paper up to December 2021, identifying only one new paper eligible for inclusion after the first literature search.

The titles and abstracts of retrieved papers were screened, and those that met the following eligibility criteria were selected for full-text analysis. For inclusion, the studies should be observational studies, published in the Latin-roman alphabet, reporting TDI prevalence, and conducted in a dental emergency unit. For the last one, only papers with the information about the emergency nature of the service and assistance provided by dental professionals contained in the text were considered. Studies conducted in dental trauma clinics, military scenarios, during environmental disasters, and the COVID-19 lockdowns were excluded. Publications such as abstracts, case reports, case series, protocols, expert opinions, letters, posters, and papers with the full text unavailable were also excluded.

A data extraction worksheet was created, then pilot tested for adjustments. The following data were collected: Study settings (author, country, language, year of publication, design, duration, and type of emergency service); Emergency sample settings (sample size, sex distribution, and age); TDI patients characteristics (sex

distribution and age); Outcome measures (number of patients with TDI, number of traumatized teeth, type of dentition, and TDI classification system).

The Joanna Briggs Institute Critical Appraisal Tool for Prevalence Studies¹⁷ was used to assess the risk of bias of the included studies. This tool consists of a checklist of nine questions structured in three key domains: Sampling/participants setting (questions 1, 2, 4, and 9), condition measurement (questions 6 and 7), and statistics (3, 5, and 8). For each question, four standard answer options are available: yes, no, unclear, and not applicable. To be rated as a "low risk of bias" or high-quality" research, a study should demonstrate an appropriate methodology in all three domains¹⁸.

During the whole selection process, data extraction, and quality appraisal, two reviewers (T.C.S.L. and S.C.C.) worked independently after proper training and calibration. A third reviewer (J.V.B.) arbitrated eventual disagreements.

The characteristics of the included studies, sample features, and outcomes of interest for the present SR were described through a narrative and tabular synthesis. The main outcome was the prevalence of TDI, expressed as percent of patients bearing TDI among those who sought dental emergency care. A proportion meta-analysis was performed to assess the overall pooled prevalence of TDI in emergency dental services. Subgroup meta-analyses was one of the aims of the present study. Therefore, primary studies were grouped according to World Health Organization (WHO) regions¹⁹; Type of emergency service; Age group; Year of publication and duration of data collection period.

Studies' heterogeneity was quantified using Cochran's Q test and the I² statistics. A value >50% for the I² test was considered an indicator of heterogeneity. In this case, the random-effects model was chosen for the meta-analysis. A logit transformation was used to the proportions for approaching a normal distribution. R software, version 4.1.0, was used for all the analyses.

The certainty of the evidence was assessed according to The Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach²⁰ and the evidence profile was produced with the aid of the GRADEPRO online software (www.gradepro.org).

RESULTS

After concluding the electronic search and removing duplicates, 1476 records were screened for titles and abstract contents, and 147 full-texts of candidate studies were evaluated. A total of 38 publications fulfilled the eligibility criteria and five studies were retrieved through hand searching in the reference lists, totalizing 43 included articles (Figure 1). The characteristics of these studies, their samples, and their outcomes are presented in Table 1. The complete reference list of the 43 primary studies as well as the list of excluded studies with reasons for exclusion are available in supplementary files.

The majority of the included studies, thirty-four, had a cross-sectional design, and nine were retrospective cohort studies. Data collection period ranged from 10 days to 10 years, being at least of 12 months in 34 studies.

The risk of bias assessed with the JBI tool showed that no article was rated as "high-quality" due to limitations in at least one of the domains. Regarding the first domain (participants), fourteen studies (32.6%) had a sample frame appropriated to address the target population, while most studies, 23 (53.5%), described the subjects and setting in detail. Also, 41 (95.4%) presented an adequate response rate or managed it appropriately. All of the 43 primary studies scored 0 out of two questions about the second domain (condition measurement), showing critical methodological issues in TDI literature addressed in the discussion section. The third domain (statistics) presented the best scores, with 37 (86%) studies positively answering 3 out of three questions and 100% showing appropriate statistical analysis (Table 2).

The WHO Region of the Americas accounted for 48.8% of the studies, being most of them conducted in Brazil (8) and the USA (7). The studies were held in different private and public settings, classified into four categories as reported in their methodology sections: Paediatric service (n=17, 39.6%); General hospital (n=13, 30.2%); Dental emergency clinic (n=9, 20.9%); Oral and maxillofacial surgery service (n=4, 9.3%) (Table 1). Information regarding the availability of 24-hour care was present in only 21 articles, showing that 16 (76.2%) attended during the 24 hours and 5 (23.8%) did not.

The sample size ranged from 53 to 88610 patients, making a total of 209099 patients. Information regarding the age of patients who sought dental emergency care was

available in 22 articles and ranged from 0 to 92 years. Thirteen studies dealt with children and adolescents from 0 to 21 years.

The number of patients bearing TDI among those who sought dental emergency care ranged from 3 to 3574, and prevalence rates ranged from 1.9% to 69.1%. Males were more affected in all studies being the proportion of males/females of about 2:1 in most of the 29 studies that reported this data. The age of patients bearing TDI ranged from 0 to 88 years but was not reported in 18 studies. Such information was presented in a heterogeneous way, such as age range (n=21), median age (n=3), mean age (n=7), and age groups (n=3). The number of traumatized teeth ranged from 52 to 6001, and the ratio of traumatized teeth per patient ranged from 1.2 to 2.3. The number of primary and permanent traumatized teeth was reported in 17 studies being 6549 and 10119, respectively. The type of TDI was classified using WHO classification modified by Andreasen in 8 studies, Ellis' classification in 3 studies, WHO classification in 1 study, and 17 didn't specify which classification system was adopted. Data on the classification of injuries were reported in 24 studies, with luxations being the most frequent cause of seeking emergency dental services after a traumatic event.

Quantitative synthesis comprised one meta-analysis including all the 43 included studies, comprising 209099 patients, using a random effect model due to the high observed heterogeneity ($I^2 = 100\%$). The overall pooled prevalence was 15.4% (95% CI: 11%-21%), and the variance estimate for this effect (between studies variance) was 1.43. (Figure 2). Another five subgroup meta-analyses were performed: WHO Regions, type of service, the age group under 21 years old, year of publication, and prevalence period. The WHO Region of the Americas had the highest TDI prevalence rate (21%) and Europe the lowest (7%). The pooled prevalence for African, Eastern Mediterranean, and South-East Asian regions was not estimated, since each region had only one included study. Studies conducted in paediatric dental emergency services, or samples including individuals under 21 years, presented the highest prevalence rates, 29% and 24%, respectively. Studies published from 2010 onwards comprised nineteen studies and 153469 patients, showing a prevalence rate of 13% (95% CI: 8%-22%, $I^2 = 100\%$). Table 2 presents detailed results for each meta-analysis, and their forest plots are available in Supplementary Files.

The certainty of evidence, assessed by the GRADE approach, was considered very low for the outcome prevalence of TDI. The risk of bias was judged to be serious due

to the presence of biases in the methodology of the primary studies, addressed in the discussion section. Inconsistency was categorized as very serious because of the high heterogeneity of the studies, quantified statistically and imprecision was judged serious due to variability of the sample size of the included studies (Supplementary Files).

DISCUSSION

This systematic review summarizes the available evidence on the prevalence of traumatic dental injuries among those patients who seek emergency dental services. The global meta-analysis shows a prevalence of 15%, this is an alarming percentage considering the clinical challenge that TDI imposes on dentists from the moment of diagnosis. TDI are complex injuries, of a multiple and acute nature, that often require time-consuming and expensive treatment, while negatively impacting the victims' quality of life^{1,2}. Since the prognosis of these injuries is closely linked to the healing processes of traumatized pulp and periodontal tissues, emergency treatment and management of traumatized teeth play a critical role in the patient's rehabilitation^{5,7}. Studies show that despite the seriousness of these injuries and their high prevalence worldwide, both the emergency service and professionals are still unprepared to deal with this condition^{12,21}.

The 43 included studies showed substantial differences regarding their design, study population, sample size, region, duration, type of service, and demographic characteristics such as age and gender distribution, explaining, therefore, the high observed heterogeneity across all studies ($I^2=100\%$), even after the subgroup analysis. Thus, the random-effects model was applied for all meta-analyses.

Subgroup analyses showed the highest prevalence, 21%, in the Americas region, and the lowest in the Europe region, 7%. Africa, Eastern Mediterranean, and South-East Asia regions were not analysed as they had only 1 study each. Considering that TDI prevalence around the world did not differ significantly among the WHO regions¹, differences observed in the present study may be explained by the heterogeneity of the publications, especially regarding differences in the context where the studies were conducted. Noteworthy is the difference between Brazil and the United States' prevalence rates of 11% and 38%, respectively (Supplementary Files). It can be speculated that such difference derives from the greater number of studies conducted

in paediatric centres in the USA, since the pooled prevalence for this type of service was the highest (29%), followed by general hospitals (13%), oral and maxillofacial surgery services (7%), and dental emergency clinics (6%).

Although the participants' age was presented in a very heterogeneous way, the combined prevalence of the thirteen studies with the age range from 0 to 21 years was estimated, showing a rate of XX%. This estimate is consistent with the dental trauma literature, as age is a well-known risk factor for TDI⁶ and further explains the higher prevalence rates in paediatric services.

Subgroup analyses of the most recent studies (year of publication ≥ 2010), shows that the current prevalence estimate (13%) remains similar to the overall estimate (15%), suggesting a linear presentation of the condition in the latter 37 years. In addition, a meta-analysis was performed to verify the prevalence in those studies that collected data for 12 months or more, considering that certain times of the year such as school holidays and some seasons may have a higher incidence of TDI due to increased outdoor activities. The results showed a slightly increased rate compared to the overall prevalence (Supplementary Files).

While appraising the risk of bias for individual studies, the JBI checklist's question number two was judged "not applicable" for all publications. This decision was taken because the included studies recruited all patients who sought emergency services during the given time window and did not perform any sampling method. Questions 6 and 7 (2nd domain) presented the most recurrent methodological problems in the primary studies, related to the methods used to diagnose/classify TDI and the professionals/researchers who performed this diagnosis/recorded the condition, respectively. Regarding question number 6, since most of the studies retrospectively assessed database records, there is a probability that the condition has been measured by more than one data collector, not necessarily similar in terms of the level of education or clinical experience. Additionally, the lack of information regarding the professionals who performed the diagnosis and recording of data on TDI introduces a risk of bias observed in all studies while evaluating question 7 and may have caused an underreporting of TDI. TDIs within an emergency service may also go underreported when it happens simultaneously with other injuries to the face or other regions of the body, which pose higher risks to patients, placing TDI as secondary conditions to be attended, masking their prevalence. For these reasons, all primary

studies that did not present data on the criteria for measurement/diagnosis of TDI and data on the expertise and calibration of professionals/researchers who performed the emergency care or registration of protocols were judged as "unclear" for the questions 6 and 7, respectively. Furthermore, to be rated with an adequate sample frame to address the target population (question 1), studies should have included both dentitions due to the relevant incidence of TDI in permanent and primary teeth¹, and should have also included patients from 0 to at least 16 years old. Since only 14 studies met these criteria, another potential limitation of the currently available evidence on the prevalence of TDI is notable, thus increasing the risk of bias.

This study has some limitations, mainly linked to the great heterogeneity of primary studies and the non-standard way of reporting TDI data, as pointed out in the quality assessment. The lack of information on the distribution of teeth in the sample of emergency patients precluded a quantitative analysis of this prevalence. And the distribution presented may not yet represent the actual proportion of permanent/primary teeth due to its direct relationship with the sampling of studies. The heterogeneous way TDI was classified also precluded a meta-analysis, studies have reported the number and type of injury with different denominators such as per teeth, per patient, or injury. The descriptive synthesis demonstrated that the most frequently observed type of TDI for the permanent dentition was crown fractures, while luxations were more frequent in the primary dentition. These results are in line with the results of previous studies^{11,22,23}.

Future research on dental trauma should take into account the need for a globalized approach to the diagnosis, recording, and reporting of the condition. In this context, the standardization of scientific studies in the area assumes great relevance, as it allows a better comparison of results and, consequently, more precise conclusions. This SR demonstrates critical errors in the body of available evidence on TDI, related to the injury classification system, inadequate sample frames, and heterogeneous ways of collecting and presenting data about the disease. There is also a need for prospective studies, since these enable the recording and reporting of TDI in a controlled manner, with calibration of researchers, inducing more standardized results.

In conclusion, considering that emergency care directly impacts the long-term prognosis of traumatized teeth, the knowledge of this prevalence represents the first step to increase the awareness at the public health level and among healthcare

policymakers regarding the dental trauma problem and may support adequate funds allocation to organize proper emergency services and first aid.

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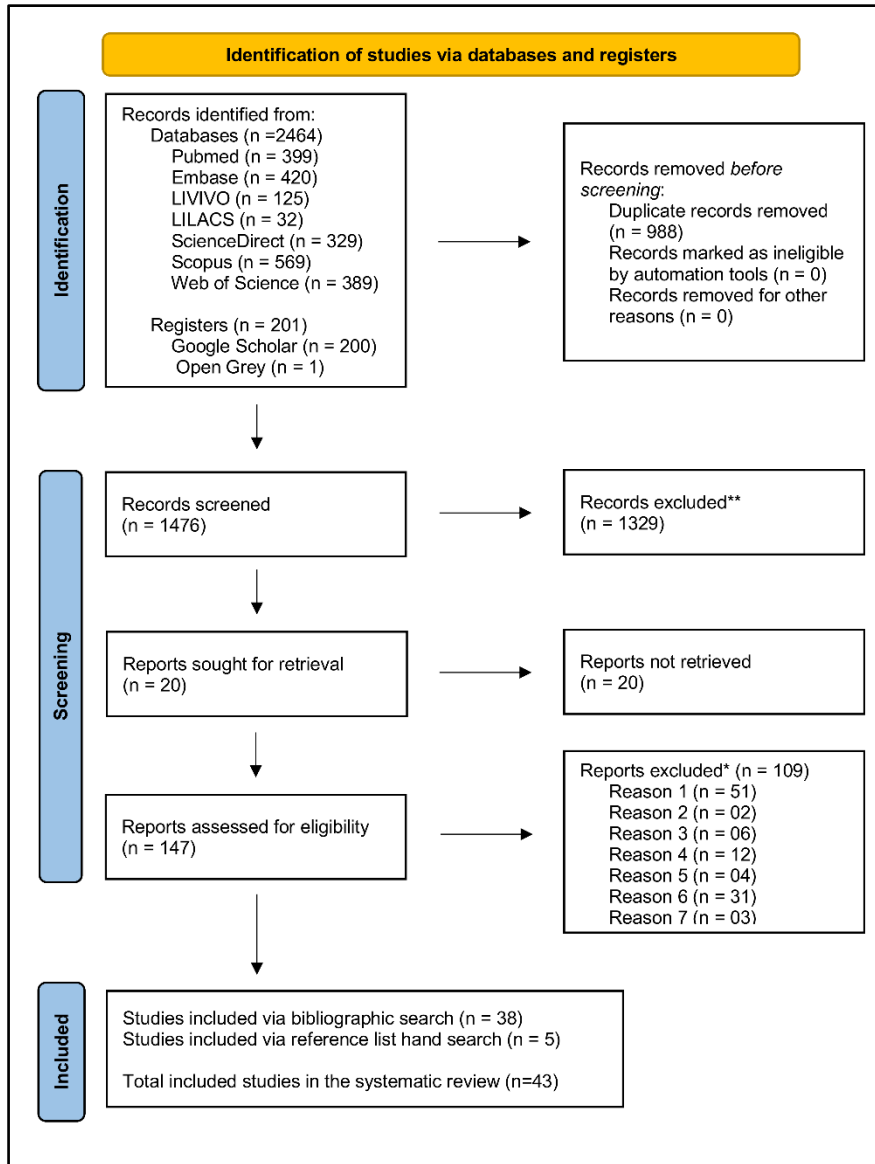
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FIGURES AND TABLES

Figure 1. 2020 PRISMA diagram for identification of studies



*, Exclusion reasons: 1) Not an emergency dental service, 2) Study design doesn't meet the eligibility criteria, 3) Incomplete text: Abstract only, full-text version unavailable/not accessible, 4) No TDI prevalence data, 5) Not published in Latin-roman alphabet, 6) Study conducted in a dental trauma clinic or presenting 100% TDI cases, 7) Study period prevalence during the COVID-19 lockdowns. Detailed in Supplementary Files.

Figure 2. Forest plot for the overall pooled prevalence of traumatic dental injuries in emergency dental services

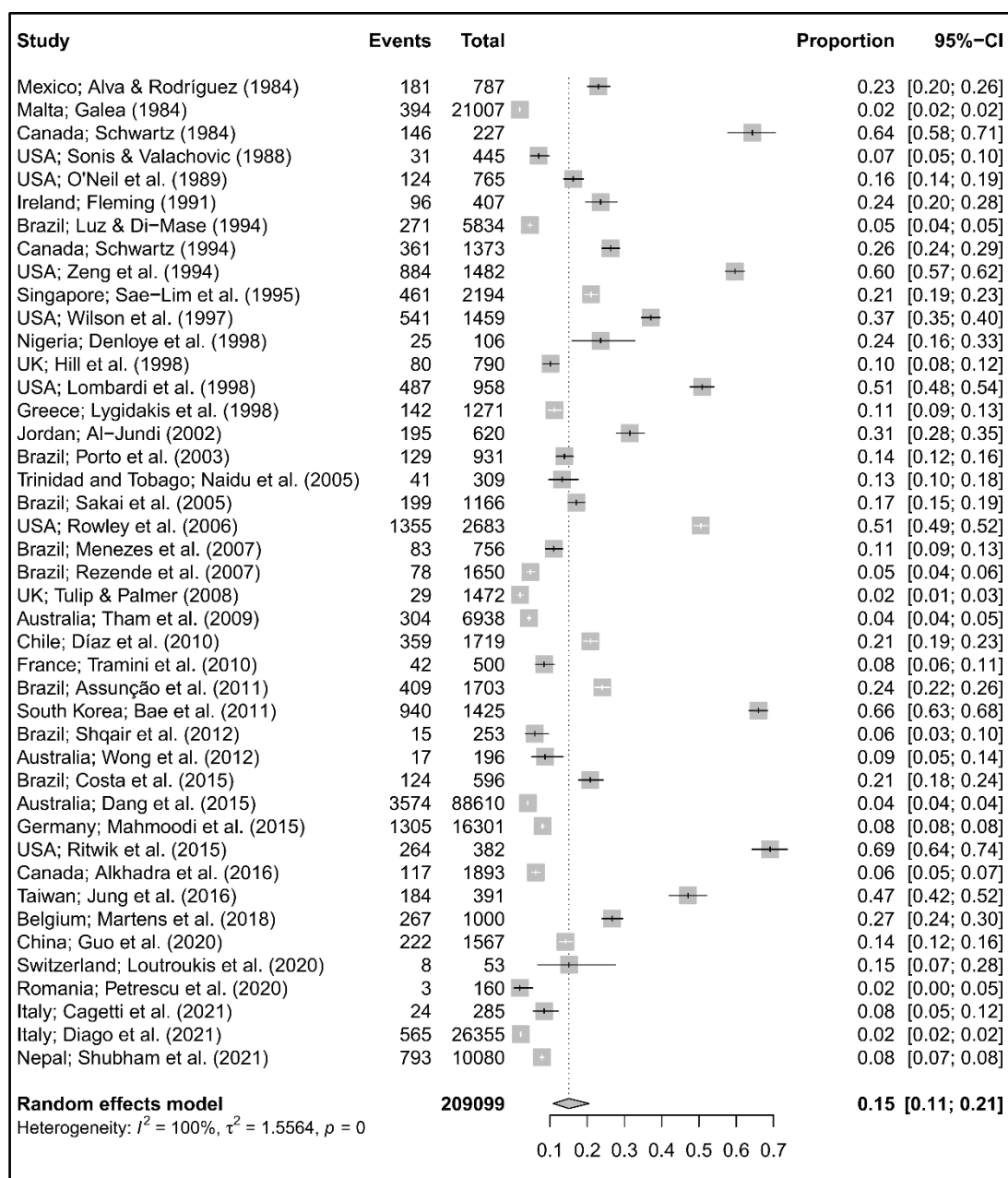


Table 1. Summary of the included studies.

Study	Settings			Sample	Outcomes				
Author (Year)	Country	Data Collection Period Study Design	Type of service	Patients (n) Male / Female (%) Age	TDI patients (n) Male / Female (%) Age	TDI Prevalence	TDI Teeth (n) Permanent (n, %) Primary (n, %)	TDI classification	Most frequent TDI (%)
Region of the Americas									
Luz & Di-Mase (1994)	Brazil	12 Months Cross-sectional	Oral and maxillofacial surgery	5834 NR NR	271 65.6% / 34.4% 0 to 50 Years	4.6%	NR	NR	Lateral luxation 27.3%
Porto <i>et al.</i> (2003)	Brazil	21 Months Cross-sectional	Paediatric	931 NR NR	129 62% / 38% 0 to 14 Years	13.9%*	194 81(41.8%) 113(58.2%)	NR	Permanent: EDF 42% Primary: Intrusion 28.3%
Sakai <i>et al.</i> (2005)	Brazil	24 Months Retrospective cohort	Dental emergency clinic	1166 50.3% / 49.7% 9.2 Years	199 57.6% / 42.4% 0 to 15 Years	17.1%	NR	NR	Dental fractures 56.8%
Menezes <i>et al.</i> (2007)	Brazil	52 Months Cross-sectional	Oral and maxillofacial surgery	756 80.3% / 19.7% NR	83* NR NR	11%	NR	NR	Avulsion 36%
Rezende <i>et al.</i> (2007)	Brazil	08 Months Cross-sectional	Oral and maxillofacial surgery	1650 NR NR	78 74% / 26% 0 to 52 Years	4.7%	NR	NR	Avulsion 20.4%
Assunção <i>et al.</i> (2011)	Brazil	120 Months Cross-sectional	Paediatric	1703 NR NR	409 57% / 43% 0 to 5 Years	24%*	679 0 679(100%)	NR	Subluxation 32.6%
Shqair <i>et al.</i> (2012)	Brazil	12 Months Retrospective cohort	Dental emergency clinic	253 51.8% / 48.2% 7.8 Years / 1 to 16 Years	15 NR NR	5.9%*	NR	NR	NR
Costa <i>et al.</i> (2015)	Brazil	80 Months Cross-sectional	Paediatric	596 NR 0 to 12 Years	124 64.1% / 35.9% 0 to 8 Years	20.8%*	254 0 254(100%)	Andreasen's	Subluxation 30%
Schwartz (1984)	Canada	12 Months Cross-sectional	Paediatric	227 57% / 43% 0 to 18 Years	146 61% / 39% NR	64.3%	280 NR NR	NR	NR
Schwartz (1994)	Canada	12 Months Cross-sectional	Paediatric	1373 55%* / 45%* 0 to 17 Years	361 61.7%* / 38.3%* 0 to 17 Years	26.3%*	631 331(52.5%)* 300(47.5%)*	NR	Permanent: EDF 33.8%* Primary: Luxation 45.7%*
Alkhadra <i>et al.</i> (2016)	Canada	48 Months Cross-sectional	General hospital	1893 NR NR	117 70.9% / 29.1% 25.1 Years / 1 to 85 Years	6.4%	NR	Ellis'	Ellis' class I ^ 22.9%

Díaz <i>et al.</i> (2010)	Chile	40 Months Cross-sectional	General hospital	1719 NR NR	359 67.4% / 32.6% 8.4 Years / 1 to 15 Years	20.1%*	670 525(78.4%)* 145(21.6%)*	Andreasen's	Permanent: EDF 32.9% Primary: Concussion/Subluxation 38.6%
Alva & Rodríguez (1984)	Mexico	30 Months Cross-sectional	Paediatric	787 NR NR	181 NR NR	23.0%	NR	Ellis'	Ellis' class VII ^B 48.0%
Naidu <i>et al.</i> (2005)	Trinidad and Tobago	07 Months Cross-sectional	Paediatric	309 47% / 53%	41 61% / 39%	13.3%	52 39(75%)* 13(25%)*	NR	EDF 21.3%*
Sonis & Valachovic (1988)	United States	03 Months Cross-sectional	General hospital	445 NR NR	31* NR NR	7.0%	NR	NR	NR
O'Neil <i>et al.</i> (1989)	United States	24 Months Cross-sectional	Paediatric	765 61.8% / 38.2%	124* 59.7%* / 40.3%* NR	16.2%*	NR	NR	Luxation 47.6%*
Zeng <i>et al.</i> (1994)	United States	120 Months Cross-sectional	Paediatric	1482 61.2% / 38.8%	884 NR 5.5 ± 4 Years	60.0%	1045 0 1045(100%)	NR	NR
Wilson <i>et al.</i> (1997)	United States	11 Months Cross-sectional	Paediatric	1459 NR NR	541 55% / 45% 0 to 18 Years	37.0%	NR	Ellis' for fractures, Unspecified for other injuries.	Dental Fractures 33%
Lombardi <i>et al.</i> (1998)	United States	36 Months Cross-sectional	Paediatric	958 NR NR	487 62.8% / 37.2% 5.5 Years / 0 to 20 Years	50.8%*	838 276(32.9%)* 562(67.1%)*	NR	Permanent: EDF 26.0% Primary: Lateral luxation 27.0%
Rowley <i>et al.</i> (2006)	United States	101 Months Cross-sectional	General hospital	2683 NR 6.8 Years	1355 63% / 37% NR	51%	NR	NR	NR
Ritwik <i>et al.</i> (2015)	United States	56 Months Retrospective cohort	Paediatric	382 NR 0 to 21 Years	264 62% / 38% 8.2 Years / 0 to 21 Years	69%*	548 290(53%) 258(47%)	Andreasen's	Permanent: Luxation 45%* Primary: Luxation 63%*
European Region									
Martens <i>et al.</i> (2018)	Belgium	36 Months Retrospective cohort	Paediatric	1000 56.1% / 43.9%	267 64%* / 36%* NR	26.7%	NR	NR	NR
Tramini <i>et al.</i> (2010)	France	07 Months Cross-sectional	General hospital	500 55% / 45% 39.8 Years	42* NR NR	8.4%	NR	NR	NR
Mahmoodi <i>et al.</i> (2015)	Germany	48 Months Cross-sectional	General hospital	16301 NR NR	1305 60.1% / 39.9% 14.7 Years / 0 to 88 Years	8%	2319 1398(60.3%)* 921(39.7%)*	Andreasen's	Permanent: EDF 38.2% Primary: Subluxation 33.7%

Lygidakis <i>et al.</i> (1998)	Greece	12 Months Cross-sectional	Paediatric	1271 53.5% / 46.5% 0 to 12 Years	142 63.3% / 36.7% NR	11.2%	241 221(91.7%)* 208(8.3%)*	NR	EDF 51%
Fleming (1991)	Ireland	12 Months Cross-sectional	Paediatric	407 61.9% / 38.1% 0 to 12 Years	96 64.7% / 35.3% 0 to 12 Years	26.8%	194 56(28.9%)* 138(71.1%)*	NR	Luxation 85.4%
Cagetti <i>et al.</i> ^c (2021)	Italy	12 Days Cross-sectional	General hospital	285 61% / 39% 43.7 Years	24 NR NR	8.4%*	NR	NR	NR
Diago <i>et al.</i> (2021)	Italy	120 Months Cross-sectional	Dental emergency clinic	26355 NR NR	565 57.5% / 42.5% 0 to 68 Years	2.1%	860 542* (63%) 318* (37%)	Andreasen's	EDF 20% Lateral luxation 20%
Galea (1984)	Malta	60 Months Cross-sectional	General hospital	21007 NR NR	394 68.8% / 31.2% 0 to 75 Years	1.9%	887 725(81.7%)* 162(18.3%)*	NR	Permanent: EDF 38.2% Primary: Extrusion 28.4%
Petrescu <i>et al.</i> ^c (2020)	Romania	01 Month Cross-sectional	General hospital	160 56.3% / 43.7% 20 Years / 2 to 78 Years	3 66.6% / 33.3% NR	1.2%*	NR	NR	NR
Loutroukis <i>et al.</i> (2020)	Switzerland	45 Months Retrospective cohort	General hospital	53 66% / 34% 33.4 Years / 16 to 81 Years	8 NR NR	15.1%	NR	NR	Dental fractures 63%
Hill <i>et al.</i> (1998)	United Kingdom	12 Months Cross-sectional	Oral and maxillofacial surgery	790 88.5% / 11.5% 21 Years / 11 to 68 Years	80 NR NR	10.1%*	NR	NR	NR
Tulip & Palmer (2008)	United Kingdom	08 Months Retrospective cohort	Dental emergency clinic	1472 52.4% / 47.6% NR	29* NR NR	2.0%*	NR	NR	NR

Western Pacific Region

Tham <i>et al.</i> (2009)	Australia	12 Months Cross-sectional	Dental emergency clinic	6938 NR NR	304 67.1% / 32.9% 0 to 80 Years	4.4%*	529 NR NR	WHO's	Luxation 35.6%*
Wong <i>et al.</i> (2012)	Australia	32 Months Retrospective cohort	Dental emergency clinic	196 51%* / 49%* 9 Years/ 2 to 18 Years	17* NR NR	8.0%*	NR	NR	NR
Dang <i>et al.</i> (2015)	Australia	48 Months Retrospective cohort	Dental emergency clinic	88610 NR NR	3574 65.4% / 34.6% 16 Years / 0 to 86 Years	4.0%*	6001 4597(76.6%) 1404(23.4%)	Andreasen's	Permanent: EDF 41.4%* Primary: Subluxation 23.9%*
Guo <i>et al.</i> ^c (2020)	China	10 Days Cross-sectional	Dental emergency clinic	1567 47.5% / 52.5% 37.5 Years / 2 to 92 Years	222 NR NR	14.2%	NR	NR	NR

Sae-Lim <i>et al.</i> (1995)	Singapore	24 Months Cross-sectional	General hospital	2194 NR NR	461 68.1% / 31.9% 0 to 83 Years	21.0%*	968 766(79%) 202(21%)	NR	Permanent: Luxation 65.8%* Primary: Luxation 92.1%*
Bae <i>et al.</i> (2011)	South Korea	12 Months Cross-sectional	General hospital	1425 62.7% / 37.3% 0 to 92 Years	940* NR NR	66.0%	NR	NR	NR
Jung <i>et al.</i> (2016)	Taiwan	24 Months Cross-sectional	General hospital	391 60.1% / 39.9% 6.4 Years / 0 to 17 Years	184 64.7% / 35.3% NR	47.1%	328 NR NR	Andreasen's	Permanent: Subluxation 26.3%* Primary: Subluxation 39.2%*
African Region									
Denloye <i>et al.</i> (1998)	Nigeria	60 Months Cross-sectional	Paediatric	106 64.2% / 35.8% 0 to 17 Years	25* NR NR	23.6%*	NR	NR	Avulsion 80%*
Eastern Mediterranean Region									
Al-Jundi (2002)	Jordan	12 Months Retrospective cohort	Paediatric	620 NR NR	195 75.4% / 24.6% 9.3 Years / 0 to 14 Years	31.0%	287 272*(94.8%) 15*(5.2%)	NR	Dental fractures 76.6%
South-East Asian Region									
Shubham <i>et al.</i> (2021)	Nepal	60 Months Cross-sectional	Dental emergency clinic	10080 NR NR	793 79.2% / 20.8% 0 to 79 Years	7.9%	NR	Andreasen's	Crown-root fracture 25.2%

NR, not reported; *, values calculated by the reviewers based on data presented by the studies; A, Ellis' classification – class I: Uncomplicated coronary fractures, involving only enamel; B, Ellis' classification – class VII: Luxation without crown and/or root fractures; C, Studies that presented data from the pre, during and/or post pandemic periods. Only data from the pre-COVID-19 period were collected and analysed; EDF, enamel and dentin fracture without pulp exposure.

Table 2. Subgroup meta-analyses.

Subgroup	Studies (n)	Sample (n)	Prevalence (%)	95% CI	i ² (%)
WHO Regions					
• Region of the Americas	21	27371	21	14-30	100
• Western Pacific Region	7	101321	17	7-35	100
• Europe	12	69601	7	4-12	100
Countries					
• Brazil	8	12889	11	7-17	99
• United States	7	8174	38	21-58	99
• Others	28	188036	13	8-19	100
Type of service					
• Paediatric services	17	14376	29	22-38	99
• General hospitals	13	49056	13	7-25	100
• Oral and maxillofacial surgery services	4	9030	7	5-10	96
• Dental emergency clinics	9	136637	6	4-9	99
Age					
• 0-21 years old	13	6348	24	15-35	100
Year of publication					
• ≥2010	19	153469	13	8-22	100
• <2010	24	55630	16	11-24	100
Prevalence period					
• ≥12 months	34	201252	18	12-25	100
• ≥11 months	9	7847	8	4-14	99

Table 3. Risk of bias assessed by the Joanna Briggs Institute checklist for prevalence studies

Author (Year)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	1 st domain*	2 nd domain*	3 rd domain*
Alva & Rodríguez (1984)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Galea (1984)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Schwartz (1984)	Y	N/A	N	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕○
Sonis & Valachovic (1988)	N	N/A	Y	N	Y	U	U	Y	N	○○○	○○	⊕⊕⊕
O'Neil et al. (1989)	N	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕⊕
Fleming et al. (1991)	N	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕⊕
Luz & Di Mase (1994)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Schwartz (1994)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Zeng et al. (1994)	N	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Sae-Lim et al. (1995)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Wilson et al. (1997)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Denloye et al. (1998)	Y	N/A	N	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕○
Hill et al. (1998)	N	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕⊕
Lombardi et al. (1998)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Lygidakis et al. (1998)	N	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕⊕
Al-Jundi (2002)	N	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Porto et al. (2003)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Naidu et al. (2005)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Sakai et al. (2005)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Rowley et al. (2006)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Menezes et al. (2007)	N	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Rezende et al. (2007)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Tulip & Palmer (2008)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕

Tham et al. (2009)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Díaz et al. (2010)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Tramini et al. (2010)	N	N/A	Y	Y	U	U	U	Y	Y	⊕⊕○	○○	⊕⊕○
Assunção et al. (2011)	N	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Bae et al. (2011)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Shqair et al. (2012)	N	N/A	N	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕○
Wong et al. (2012)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Costa et al. (2015)	N	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕⊕
Dang et al. (2015)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Mahmoodi et al. (2015)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Ritwik et al. (2015)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Alkhadra et al. (2016)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕
Jung et al. (2016)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Martens et al. (2018)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Guo et al. (2020)	Y	N/A	Y	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕⊕
Loutroukis et al. (2020)	N	N/A	N	Y	N	U	U	Y	Y	⊕⊕○	○○	⊕○○
Petrescu et al. (2020)	Y	N/A	N	Y	Y	U	U	Y	Y	⊕⊕⊕	○○	⊕⊕○
Cagetti et al. (2021)	U	N/A	N	Y	Y	U	U	Y	Y	⊕⊕○	○○	⊕⊕○
Diago et al. (2021)	Y	N/A	Y	Y	Y	U	U	Y	U	⊕⊕○	○○	⊕⊕⊕
Shubham et al. (2021)	U	N/A	Y	N	Y	U	U	Y	Y	⊕○○	○○	⊕⊕⊕

Q1, Was the sample frame appropriate to address the target population?; Q2, Were study participants sampled in an appropriate way?; Q3, Was the sample size adequate?; Q4, Were the study subjects and the setting described in detail?; Q5, Was the data analysis conducted with sufficient coverage of the identified sample?; Q6, Were valid methods used for the identification of the condition?; Q7, Was the condition measured in a standard, reliable way for all participants?; Q8, Was there appropriate statistical analysis?; Q9, Was the response rate adequate, and if not, was the low response rate managed appropriately? N, no; N/A, not applicable; U, unclear; Y, yes; *, 1st domain: Sampling/participants setting (questions 1, 2, 4, and 9), 2nd domain: condition measurement (questions 6 and 7), 3rd domain: statistics (3, 5, and 8); ⊕, Yes; ○, No, Unclear.

SUPPLEMENTARY FILES

1. Specific search strategies for each of the databases.

2. Reference list of included studies

3. Excluded publications and reasons

4. Forest plot for subgroup analysis: WHO Regions

5. Forest plot for subgroup analysis: Countries

6. Forest plot for subgroup analysis: Type of service

7. Forest plot for subgroup analysis: Age, 0-21 years

8. Forest plot for subgroup analysis: Year of publication

9. Forest plot for subgroup analysis: Prevalence period

10. The Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) Profile.

1. Specific search strategies for each of the databases.

Database	Search strategy	First Search Results (n)	Last Search Results (n)
PubMed	(prevalence[MeSH terms] OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injuries"[MeSH terms] OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergency[MeSH terms] OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")	March 2021 365	2, December, 2021 399
Embase	#1 ('prevalence'/exp OR 'prevalence' OR 'incidence'/exp OR 'incidence' OR 'frequency'/exp OR 'frequency' OR 'occurrence' OR 'proportion' OR 'epidemiology'/exp OR 'epidemiology') #2 ('tooth injury'/exp OR 'tooth injury') #3 ('emergency'/exp OR 'emergency') #4 (#1 AND #2 AND #3)	March 2021 382	3, December, 2021 420
LILACS	(prevalence OR incidence) AND ("tooth injuries") AND (emergency OR emergencies)	March 2021 29	3, December, 2021 32

LIVIVO	(prevalence[MeSH terms] OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injuries"[MeSH terms] OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergency[MeSH terms] OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")	March 2021 111	2, December 2021 125
ScienceDirect	(prevalence OR incidence OR frequency) AND ("tooth injuries" OR "traumatic dental injuries" OR "dentoalveolar trauma") AND ("emergency" OR "urgency" OR "health service")	March 2021 306	2, December, 2021 329
Web of Science	#1 TS=(prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology) #2 TS=("tooth injur*" OR "traumatic dental injur*" OR "maxillo\$facial trauma" OR "maxillo\$facial injur*" OR "maxillo\$facial fracture" OR "oro\$facial trauma" OR "oro\$facial injur*" OR "dental trauma" OR "dental injur*" OR "dental fracture" OR "dento\$facial trauma" OR "dento\$facial injur*" OR "dento\$facial fracture" OR "dento\$alveolar trauma" OR "dento\$alveolar injur*" OR "dento\$alveolar fracture") #3 TS=(emergenc* OR urgenc* OR "health service*") #4 #1 AND #2 AND #3	March 2021 303	3, December, 2021 389

SCOPUS	(TITLE-ABS-KEY((prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology OR epidemiologic)) AND TITLE-ABS-KEY(("tooth injur*" OR "traumatic dental injur*" OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*")) AND TITLE-ABS-KEY(("emergenc*" OR "urgenc*" OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*"))	March 2021 512	2,	December, 2021 569
Google Scholar	prevalence (prevalence OR incidence OR frequency OR occurrence OR proportion OR epidemiology OR epidemiologic) AND trauma ("tooth injuries" OR "tooth injury" OR "traumatic dental injuries" OR "traumatic dental injury" OR "dental injuries" OR "dental injury" OR "dental trauma" OR "dental fractures" OR "dental fracture" OR "dentoalveolar trauma" OR "dentoalveolar injuries" OR "dentoalveolar injury" OR "dentoalveolar fractures" OR "dentoalveolar fracture") AND emergency (emergency OR urgency OR "emergency service" OR "emergency department" OR "dental emergency" OR "medical emergency service" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit" OR "emergency center" OR "emergicenter" OR "emergency health service" OR "health service")	March 2021 1530 First included	3, 180	December, 2021 1770 First included 200

OpenGrey	(prevalence OR incidence OR frequenc* OR occurrenc* OR proportion* OR epidemiology[MeSH terms] OR epidemiologic) AND ("tooth injur*" OR "maxillofacial trauma*" OR "maxillofacial injur*" OR "maxillofacial fracture*" OR "maxillo-facial trauma*" OR "maxillo-facial injur*" OR "maxillo-facial fracture*" OR "orofacial trauma*" OR "orofacial injur*" OR "oro-facial trauma*" OR "oro-facial injur*" OR "dental trauma*" OR "dental injur*" OR "dental fracture*" OR "dentofacial trauma*" OR "dentofacial injur*" OR "dento-facial trauma*" OR "dento-facial injur*" OR "dentoalveolar trauma*" OR "dentoalveolar injur*" OR "dentoalveolar fracture*" OR "dento-alveolar trauma*" OR "dento-alveolar injur*" OR "dento-alveolar fracture*") AND (emergenc* OR urgenc* OR "emergency service*" OR "emergency department" OR "dental emergenc*" OR "medical emergency service*" OR "emergency care" OR "emergency treatment" OR "emergency attention" OR "emergency unit*" OR "emergency center*" OR "emergicenter*" OR "emergency health service*" OR "health service*")	March 2021 1	3,	*November, 2021 1
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*OpenGrey Repository was discontinued in December 1, 2021

2. Reference list of included studies

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3. Excluded publications and reasons (n=109).

Author(s) / Year	Title	Criteria of Exclusion*
Acton et al., 1996	Bicycle riding and oral/maxillofacial trauma in young children	1
Agostini et al., 2001	Dental emergencies in a university-based pediatric dentistry postgraduate outpatient clinic: a retrospective study	1
Al-Malik, 2009	Oral injuries in children attending a hospital in Saudi Arabia	6
An et al., 2013	Dental trauma patients visiting the emergency room in H hospital	5
Ansari, 2004	Maxillofacial fractures in Hamedan province, Iran: A retrospective study (1987-2001)	4
Arangio et al., 2014	Maxillofacial fractures in the province of Latina, Lazio, Italy: Review of 400 injuries and 83 cases	1
Arango et al., 2000	Atendidos En La Clinica Ces Sabaneta (Antioquia, Colombia), Entre 1992 Y 1995	6
Aren et al., 2013	Predominant causes and types of orofacial injury in children seen in the emergency department	6
Azadani et al., 2021	The association between traumatic dental and brain injuries in American children	1
Banky & McCrory, 1999	Mouthguard use in Australian football	1
Batstone et al., 2004	Treatment delays in paediatric dento-alveolar trauma at a tertiary referral hospital	6
Bhat & Li, 1990	Consumer product-related tooth injuries treated in hospital emergency rooms: United States, 1979-87	1
Binaisse et al., 2020	Dental emergencies at sea: A study in the French maritime TeleMedical Assistance Service	1
Bruns et al., 2008	Dental trauma that requires fixation in a children's hospital	4
Büecher et al., 2012	Traumatic dental injuries at a German university clinic 2004-2008	6
Caldas-Jr & Burgos, 2001	A retrospective study of traumatic dental injuries in a Brazilian dental trauma clinic.	6
Carrasco & Figueroa, 2002	Estudio descriptivo de traumatismo dentoalveolar en pacientes atendidos en	3

	hospitales del Servicio de Salud de la V Región, año 2000	
Castro-Brezzo & Dreyer-Arroyo, 2012	Prevalencia de traumatismos dentoalveolares en pacientes infantiles del complejo asistencial Dr. Sótero del Río	1
Cavalcanti, 2009		4
Chou et al., 2021	Head and Neck Injuries from Rock Climbing: A Query of the National Electronic Injury Surveillance System	1
Cully et al., 2019	Prevalence of Primary Teeth Injuries Presenting to a Pediatric Emergency Department	6
Da-Silva et al., 2004	Incidence of dental trauma associated with facial trauma in Brazil: a 1-year evaluation	1
Davies et al., 2020	British Association of Oral and Maxillofacial Surgeons' National Facial Injury Surveys: hard tissue facial injuries presenting to UK emergency departments	1
Del-Rosario, 1992	Traumatic injuries to primary teeth in Mexico City children.	6
Eggmann et al., 2021	Impact of the COVID-19 pandemic on urgent dental care delivery in a Swiss university center for dental medicine	4
Ellis et al., 1999	Influence of patient age on the nature of tooth fracture.	4
Fareen et al., 2020	Prevalence Of Tooth Injuries Among Children 2 To 13 Years of Age Reporting to Dental Hospital- An Institutional Based Retrospective Study	1
Ferreira et al., 2015	Retrospective evaluation of tooth injuries and associated factors at a hospital emergency ward	6
Figueiredo et al., 2018	Emergency department visits for dental problems associated with trauma in Alberta: A report between the years 2011 and 2017	1
Franciscatto et al., 2020	Association between pulp and periapical conditions and dental emergency visits involving pain relief: epidemiological profile and risk indicators in private practice in Australia	1
Gassner et al., 1999	Incidence of oral and maxillofacial skiing injuries due to different injury mechanisms	1
Gill et al., 2012	Oral piercing injuries treated in United States emergency departments, 2002-2008	1

Gong et al., 2011	Emergency dental injuries presented at the Beijing Stomatological Hospital in China	6
Gordy et al., 2004	Oral trauma in an urban emergency department	6
Goswami et al., 2021	From lockdown to slow release: Pediatric dental services during covid-19 pandemic—emergency preparedness and impact on future	7
Guedes et al., 2010	A retrospective study of traumatic dental injuries in a Brazilian dental urgency service	6
Guedes et al., 2013	A retrospective study of 92 avulsed primary teeth in 69 children assisted at a dental urgency service	4
Guo et al., 2021	Epidemiology of maxillofacial soft tissue injuries in an oral emergency department in Beijing: A two-year retrospective study	6
Gustafson et al., 2011	Continued care of children seen in an emergency department for dental trauma	6
Hahn et al., 2021	The utilization of dental emergency services during COVID-19 pandemic in a German university center: Do we lose vulnerable patients?	3
Haliti et al., 2020	Teeth and Soft Tissue Injuries as Well as Wound Healing Quality Patterns Among Primary School Students of Prishtina Region	4
Hall et al., 2016	Dental Trauma in a Pediatric Emergency Department Referral Center	1
Halling & Ordell, 2000	Emergency dental service is still needed--also for regular attenders within a comprehensive insurance system	1
Hong et al., 2011	Secular trends in hospital emergency department visits for dental care in Kansas City, Missouri, 2001-2006	1
Hong et al., 2015	Neighborhood socio-economic context and emergency department visits for dental care in a U.S. Midwestern metropolis	1
Howard et al., 2013	Fliker injuries in children	3
Huang et al., 2019	Trends, demographics, and conditions of emergency dental visits in Taiwan 1997–2013: A nationwide population-based retrospective study	1
Ignatius et al., 1992	Frequency and type of dental traumas in mandibular body and condyle fractures	1

Ilangovan et al., 2020	Incidence of dental traumatic injuries among teenagers and adults	1
James et al., 2018	Dental injuries in younger emergency department patients	1
Jang et al., 2011	A clinical study on the dental emergency patients visiting a University Hospital emergency room	5
Joachim et al., 2018	Pediatric maxillofacial trauma: Epidemiologic study between the years 2012 and 2015 in an Israeli medical center	1
Judd, 1985	Paediatric dental trauma: a hospital survey	6
Kallel et al., 2020	The Incidence of Complications of Dental Trauma and Associated Factors: A Retrospective Study	1
Kamalova et al., 2020	Reasons For 1-17-Year-Old Children to Visit a Dentist During the Covid-19 Pandemic	7
Keim et al., 2012	Injuries associated with bottles, pacifiers, and sippy cups in the United States, 1991-2010	1
Kidd et al., 2010	Facial injury patterns in a UK paediatric population aged under 13 years	1
Kim et al., 2000	Incidence of teeth injuries in a hospital emergency room	5
Kubiak & Slongo, 2003	Unpowered scooter injuries in children	1
Ladrillo et al., 2006	Increasing prevalence of emergency department visits for pediatric dental care, 1997-2001	1
Lewis et al., 2003	Dental complaints in emergency departments: A national perspective	1
Lieger et al., 2009	Dental Injuries in Association with Facial Fractures	6
Liew & Daly, 1986	Anterior dental trauma treated after-hours in Newcastle, Australia	6
Lin et al., 2007	Dento-alveolar and maxillofacial injuries - A retrospective study from a level 1 trauma center in Israel	6
Lin et al., 2008a	Dento-alveolar and maxillofacial injuries: A 5-year multi-center study. Part 1: General vs facial and dental trauma	6
Lin et al., 2008b	Dento-alveolar and maxillofacial injuries: A 5-year multi-center study. Part 2: Severity and location	6
Lin et al., 2009	Dento-alveolar and maxillofacial injuries among different ethnic groups in Israel	6

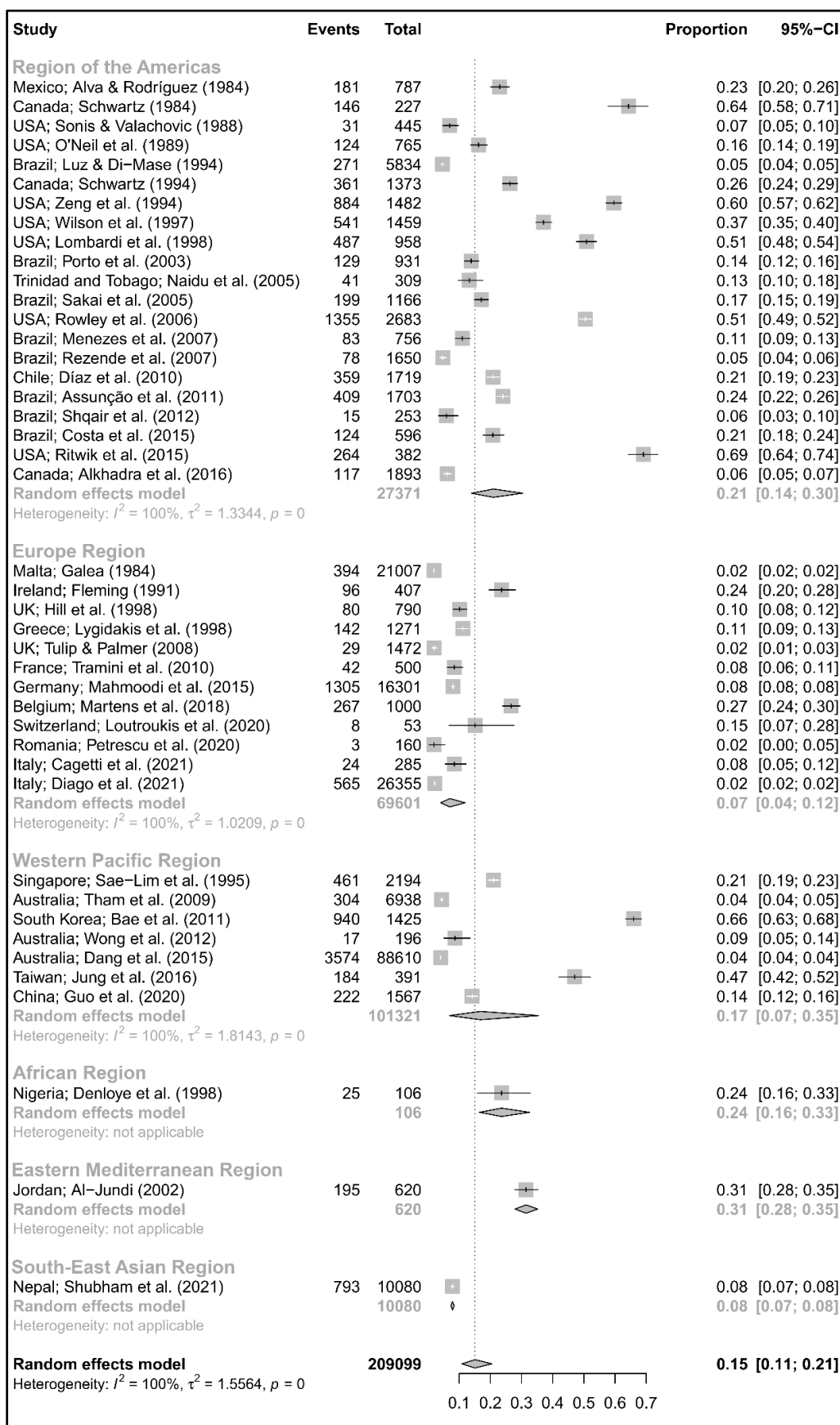
Linn et al., 1998	Epidemiology of bicycle injury, head injury, and helmet use among children in British Columbia: A five-year descriptive study	1
Maguire et al., 2000	A retrospective study of treatment provided in the primary and secondary care services for children attending a dental hospital following complicated crown fracture in the permanent dentition	6
Majorana et al., 2003	Root resorption in dental trauma: 45 Cases followed for 5 years	4
Marc et al., 1990	Redaction of medical certificates for maxillo-dental injuries. Analysis of 2150 certificates in case of assault and battery	3
Marshman et al., 2016	Who attends a Children's Hospital Emergency Department for dental reasons? A two-step cluster analysis approach	1
Martin et al., 1990	After-hours treatment of anterior dental trauma in Newcastle and western Sydney: a four-year study	6
Mascarenhas et al., 2012	Epidemiological profile of emergency care for dental and oral injuries in Brazil, 2006-2007	1
McGuire et al., 2008	The presenting complaints of low-income adults for emergency dental care: an analysis of 35,000 episodes in Victoria, Australia	3
Medina et al., 2006	Maxillofacial fractures in Chilean subjects	1
Mitchell et al., 2014	Managing pediatric dental trauma in a hospital emergency department	3
Montero et al., 2019	Pediatric Sports- and Recreation-Related Dental Injuries Treated in US Emergency Departments	1
Munro & Ackerman, 2019	The Degree of Overjet and Anterior Traumatic Dental Injury in the Mixed Dentition: A Single-Center Experience	6
Nalliah et al., 2015	Epidemiology and Outcomes of Hospital-based Emergency Department Visits with Tooth Fractures	1
Ng et al., 2020	Traumatic dental injuries presenting to a paediatric emergency department in a tertiary children's hospital, Adelaide, Australia	1
Núñez-Ramos et al., 2013	Manejo del traumatismo alvéolo-dentario infantil en el Servicio de Urgencias de un hospital terciario	1
Özgür et al., 2021	A 3-Year retrospective study of traumatic dental Injuries to the primary dentition	1

Parten et al., 2019	Medical emergency department attendance of under 16-year-olds with dental problems	1
Ravindranath et al., 2016	Patterns of dental trauma in children presenting in hospital based dental clinics: A review	2
Rego et al., 2019	Oral and cranio-maxillofacial trauma in children and adolescents in an emergency setting at a Brazilian hospital	4
Rhouma, 2012	Epidemiology, socio-demographic determinants and outcomes of paediatric facial and dental injuries in Scotland	1
Roccia et al., 2013	An 11-year review of dental injuries associated with maxillofacial fractures in Turin, Italy	4
Ruddy & Selbst, 1990	Three-wheeled vehicle injuries in children	1
Sae-Lim & Yuen, 1997	An evaluation of after-office-hour dental trauma in Singapore	6
Sari et al., 2014	A retrospective evaluation of traumatic dental injury in children who applied to the dental hospital, Turkey	4
Silva & Lebrão, 2003	Study of dental morbidity in hospitals in the City of Sao Paulo	4
Silva et al., 2011	Perfil epidemiológico do trauma dentário e facial em Curitiba	6
Simões et al., 2004	Fatores etiológicos relacionados ao traumatismo alvéolo-dentário de pacientes atendidos no pronto-socorro odontológico do Hospital Universitário Cajuru	6
Stewart et al., 2009a	Consumer products and activities associated with dental injuries to children treated in United States emergency departments, 1990-2003	1
Stewart et al., 2009b	Consumer products and oral trauma	2
Suhasini & Gheena, 2015	Dental trauma in children and young adults	1
Sun et al., 2011	A Clinical Study on The Emergency Patients of Oral and Maxillofacial Surgery Visiting Sang-Gye Paik Hospital Emergency Room.	5
Tan et al., 2020	Dental injuries at the Xi'an, China Stomatological Hospital: A Retrospective Study	6
Trullàs et al., 2013	Frequency and characteristics of occupational dental trauma	1

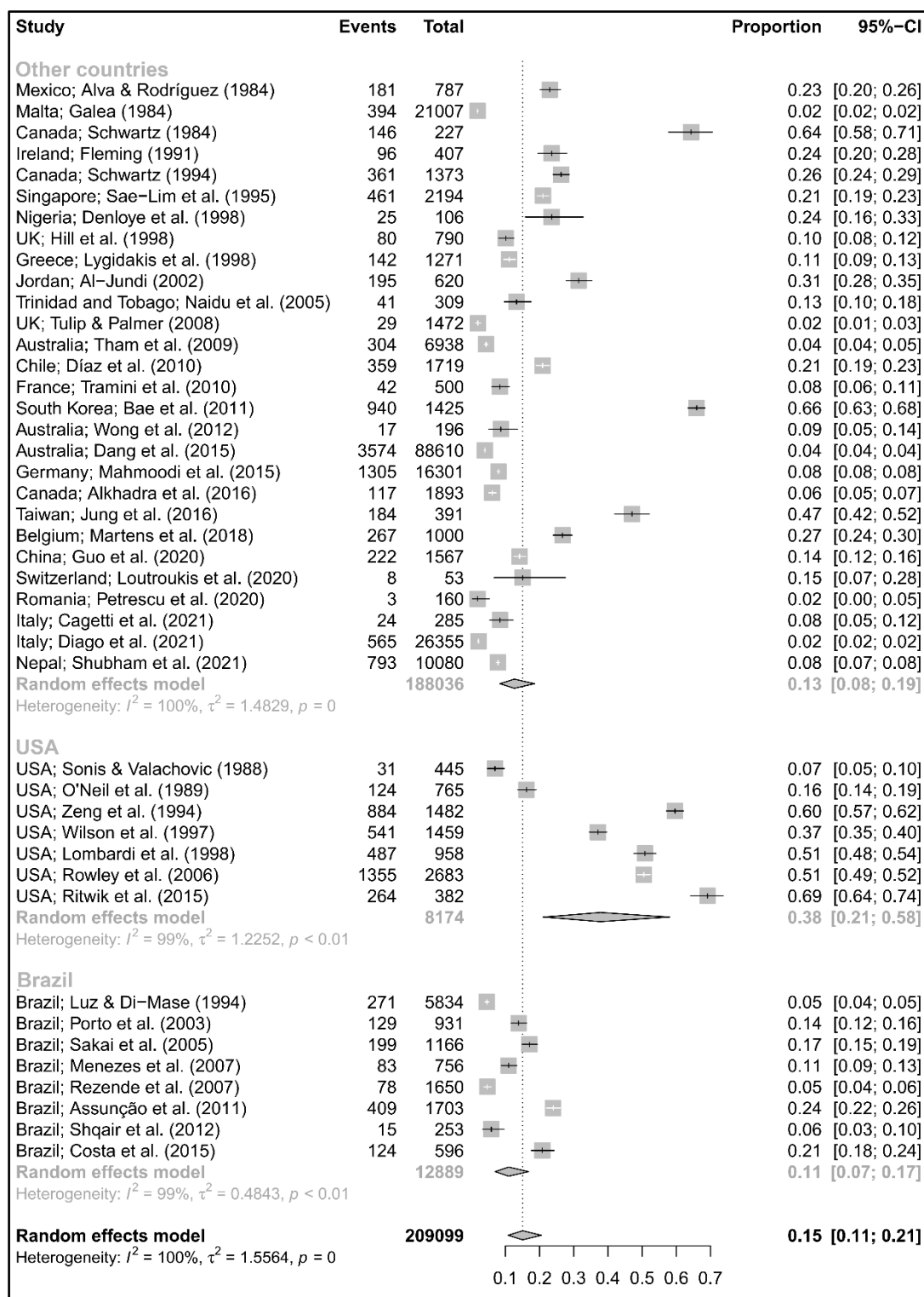
Vaca et al., 2005	Skatepark-related injuries in a southern California skatepark and their associated short-term disability and healthcare utilization	1
Velásquez et al., 2014	Patrones Epidemiológicos del Trauma Dentoalveolar (PatologíaGES) en Pacientes Adultos Atendidos en un Centro de Trauma de Chile Durante 2 Períodos	6
Venegas et al., 2013	Maxillofacial injuries, experience in 343 patients	1
Verma & Chambers, 2014	Dental emergencies presenting to a general hospital emergency department in Hobart, Australia	1
Waldrop et al., 2000	Increasing frequency of dental patients in the urban ED	1
Warren, 2014	After hours presentation of traumatic dental injuries to a major paediatric teaching hospital	6
Wu, 2020	What Are the Predictors of Craniomaxillofacial Injuries from Hoverboard Accidents?	1
Yang et al., 2021	Online consultation and emergency management in paediatric dentistry during the COVID-19 epidemic in Wuhan: A retrospective study.	7
Zhang & Gong, 2011	Characteristics of avulsed permanent teeth treated at Beijing Stomatological Hospital	6

*1- Not an emergency dental service; 2- Study design doesn't meet the eligibility criteria; 3- Incomplete text: Abstract only, full-text version unavailable/not accessible; 4- No TDI prevalence data; 5- Not published in Latin-roman alphabet; 6- Study conducted in a dental trauma clinic or presenting 100% TDI cases; 7- Study period prevalence during the COVID-19 lockdowns.

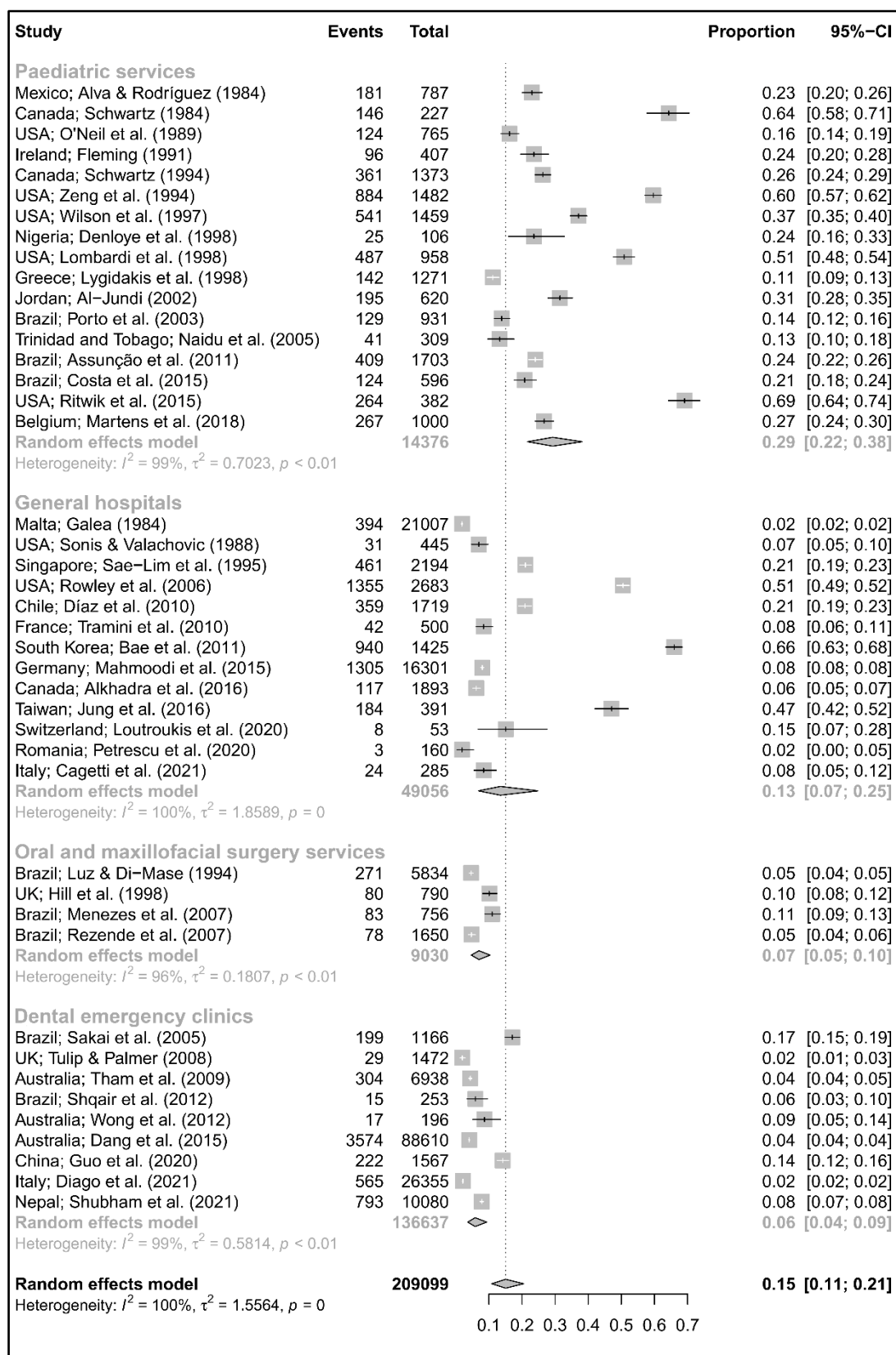
4. Forest plot for subgroup analysis: WHO Regions



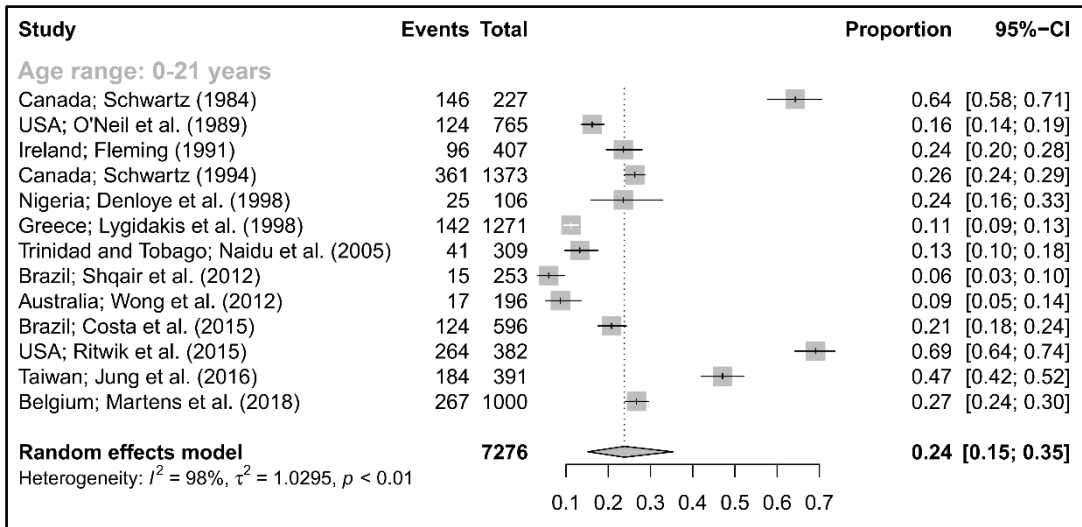
5. Forest plot for subgroup analysis: Countries



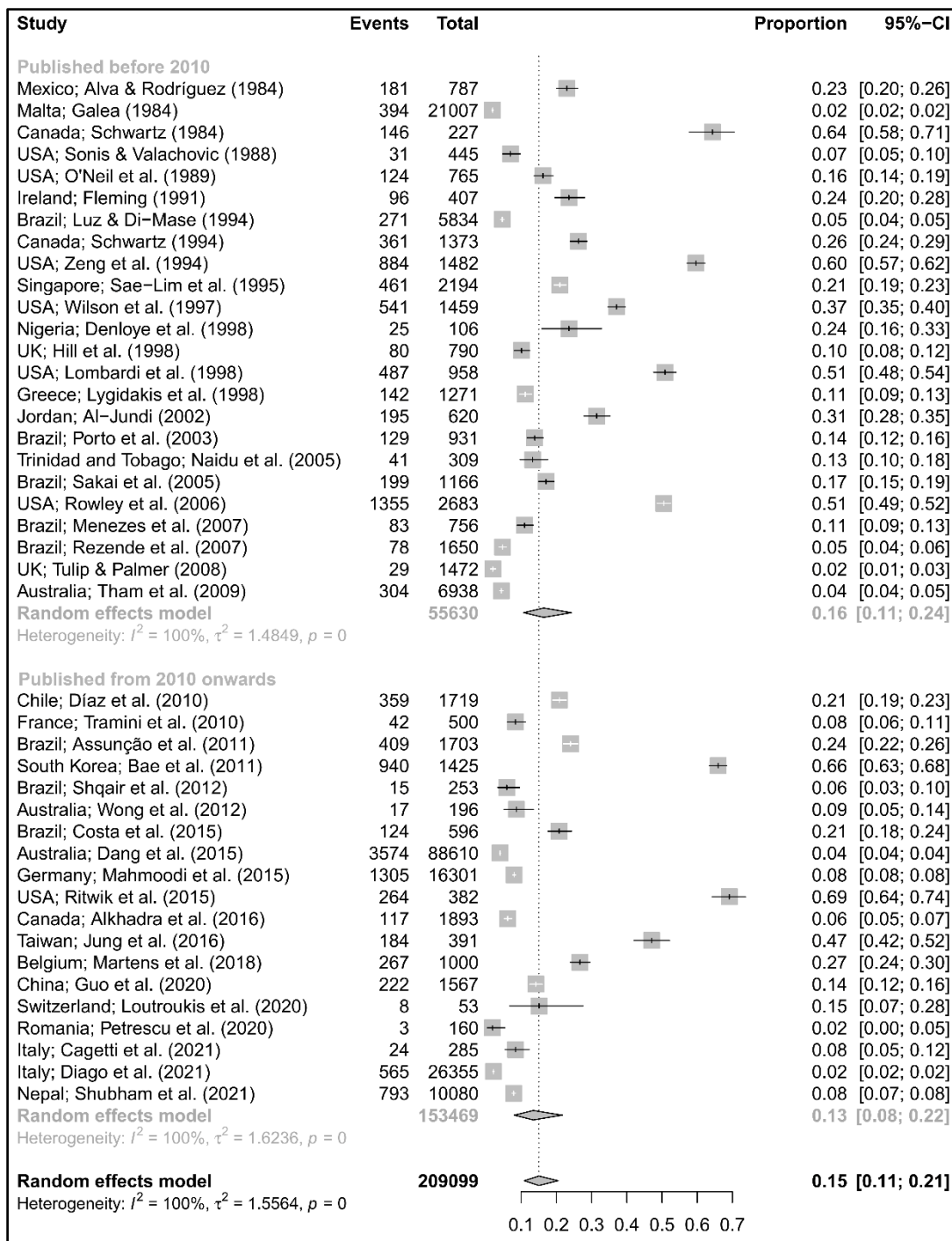
6. Forest plot for subgroup analysis: Type of service



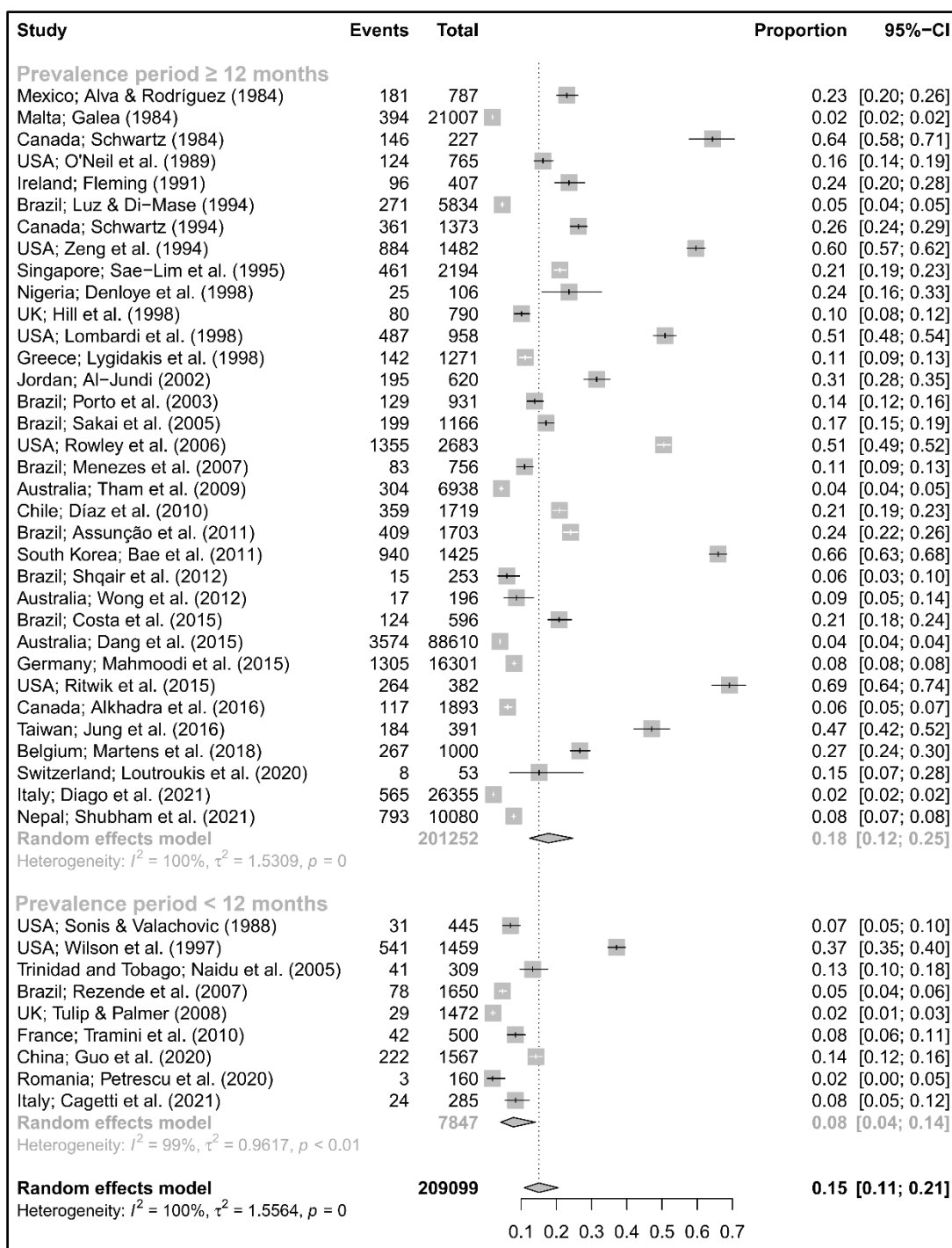
7. Forest plot for subgroup analysis: Age, 0-21 years



8. Forest plot for subgroup analysis: Year of publication



9. Forest plot for subgroup analysis: Prevalence period



10. The Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) Profile.

Research Question: What is the prevalence of traumatic dental injuries among patients who seek treatment at emergency dental services?

No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Sample	Pooled prevalence	Certainty
Outcome: Prevalence of traumatic dental injuries									
43	Observational studies	Serious ^A	Very serious ^B	Not serious	Serious ^C	None	209099	15.4% (95% CI: 11%-21%, I ² = 100%)	⊕○○○ Very low

A, The Joanna Briggs Institute Critical Appraisal Tool for Prevalence Studies was used to assess the risk of bias of the primary studies. Across the 44 publications, 11 were judged as low risk of bias, 30 as moderate risk and 3 as high risk of bias. Furthermore, questions related to the methods used to diagnose/classify TDI and the professionals/researchers who performed this diagnosis/recorded the condition were unclear for all the primary studies, suggesting methodological problems. B, Inconsistency was judged very serious based on the high heterogeneity statistically quantified for the overall pooled prevalence (I²=100%). C, Imprecision was judged serious due to variability of the sample size of the included studies.

5 CONSIDERAÇÕES FINAIS

O presente estudo consistiu em uma revisão sistemática e meta-análise com o objetivo de responder à pergunta “Qual a prevalência de lesões traumáticas dentoalveolares nos serviços odontológicos de urgência?”.

Embora suas causas sejam conhecidas, as LTDA ainda são condições negligenciadas, considerando-se a escassez de programas para sua prevenção e controle. Ao mesmo tempo, verifica-se a falta de políticas públicas específicas direcionadas para este agravo que tem alta prevalência relatada mundialmente (PETTI; GLENDOR; ANDERSSON, 2018), resultando em um déficit na qualidade de vida dos indivíduos traumatizados e impactando negativamente toda a sociedade devido ao seu tratamento complexo, prolongado e dispendioso (PETTI et. al.,2018).

O problema dos traumatismos dentários deve ser abordado de forma abrangente. Iniciando-se pela prevenção de acidentes e divulgação do conhecimento sobre os primeiros cuidados a serem instituídos no momento do trauma que, se aplicados, proporcionam melhores prognósticos. Além disso, um serviço emergencial deve estar bem organizado e disponível para atender as vítimas de traumatismos dentários, dando sequência aos cuidados imediatos. Por fim, é fundamental garantir a continuidade do tratamento das sequelas, acompanhamento em longo prazo, e reabilitação completa dos pacientes.

Neste contexto, o conhecimento da prevalência das LTDA dentro dos serviços de urgência odontológicos representa um primeiro passo para subsidiar a estruturação de uma linha de cuidado específica para esta condição, visando a organização apropriada dos serviços emergenciais e primeiros-socorros, alocação de recursos humanos e financeiros.

Na presente revisão, demonstrou-se que a taxa de prevalência global das LTDA em serviços de urgência odontológicos como resultado da meta-análise foi 15,4%. Este valor, a princípio, já é preocupante por se tratar de uma condição clínica complexa, que exige profundo conhecimento técnico-científico do profissional. Ademais, as LTDA podem trazer sequelas graves para o paciente. Por outro lado, pode-se especular que esta prevalência esteja subnotificada na literatura, uma vez que os estudos disponíveis apresentaram muitas limitações.

A principal dificuldade na realização desta revisão foi a grande heterogeneidade das publicações quanto às regiões, tamanho e característica das amostras, delineamento, método diagnóstico das LTDA, classificação das LTDA e particularidades do serviço de saúde no qual foram conduzidos. Esta heterogeneidade trouxe dificuldades não somente para a combinação dos dados como para a coleta destes, e pode ser explicada parcialmente pelo fato da prevalência de LTDA não corresponder ao principal objetivo/desfecho de parte dos estudos.

A ausência de informações sobre o número, qualificação e calibração dos profissionais que realizaram o diagnóstico e registro dos dados sobre as LTDA introduz um importante risco de viés observado em todos os estudos incluídos nesta revisão. Este possível viés está relacionado aos métodos utilizados para identificação da condição estudada, bem como se as LTDA foram avaliadas de forma padronizada e reproduzível para todos os participantes. Pergunta-se: os envolvidos na coleta de dados sobre as LTDA foram treinados ou educados no uso do(s) instrumento(s)? Se houve mais de um coletor de dados, eles eram semelhantes em termos de nível de escolaridade, experiência clínica, de pesquisa, ou nível de responsabilidade na pesquisa avaliada? Esta limitação pode ter causado uma subnotificação das LTDA uma vez que profissionais despreparados ou com baixo nível de conhecimento sobre traumatismos dentários podem gerar uma subnotificação da condição. Adicionalmente, sobre o diagnóstico, as LTDA dentro de um serviço emergencial também podem estar subnotificadas quando acontecem simultaneamente com outros traumatismos de face ou de outras regiões do corpo, que proporcionam maiores riscos aos pacientes, colocando as LTDA como condições secundárias a serem tratadas, mascarando sua prevalência.

Outra variável coletada que reflete a heterogeneidade das publicações foi a distribuição por tipo de lesão traumática. Esta classificação estava presente em 27 estudos, mas relatada de diferentes formas considerando-se como denominador da proporção o número de diagnósticos, o número de dentes e, por vezes, o número de pacientes. Além disso, os estudos também não seguiram a mesma classificação para as LTDA, sendo que 17 publicações sequer especificam a classificação que adotaram. Houve ainda a divisão dessas classificações por tipo de dentição, sendo que alguns estudos relataram a frequência em dentes decíduos e permanentes somados,

separados, ou não dividiram as dentições. Tudo isso resultou na impossibilidade de analisar estes dados quantitativamente.

A idade, tanto da amostra de pacientes de emergência quanto do percentual de pacientes portadores de LTDA, foi uma variável ausente em 31 e 21 estudos, respectivamente. Quando apresentada, foi relatada de forma não-padronizada, em faixas etárias categorizadas, variações de menor e maior idade, média ou mediana, o que dificultou uma análise mais aprofundada. Como a idade é considerada um fator de risco para LTDA tais inconsistências foram uma limitação relevante. Quando agrupados os estudos cujas amostras incluíram a faixa etária de 0 a 21 anos de idade, observou-se uma maior prevalência de 24%, assim como nos serviços odontopediátricos, 29%. Esta prevalência aumentada deve ser interpretada como um achado importante, respondendo com mais precisão à pergunta formulada nesta revisão sistemática, considerando que 90% das LTDA ocorrem antes dos 20 anos (GLENDOR, 2008; LAM, 2008).

De qualquer forma, seja a prevalência global (15,4%) ou a da faixa etária mais acometida (24%), os dados encontrados são alarmantes: estudos recentes demonstram que os serviços emergenciais ao redor do mundo são despreparados e possuem limitações, quanto à disponibilidade, atendimento 24 horas e capacidade para tratarem essas lesões (ALNAGGAR; ANDERSSON, 2014). Além disso, também é demonstrado um baixo nível de conhecimento acerca dos traumatismos dentários entre profissionais de saúde, dentistas e não-dentistas (HARTMANN *et al.*, 2019; TAYLOR *et al.*, 2021; TEWARI *et al.*, 2021; ÜSTÜN; ÜSTÜN, 2021).

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**ANEXO A – Checklist para avaliação do risco de viés de estudos de
prevalência do *Joanna Briggs Institute***



CHECKLIST FOR PREVALENCE STUDIES

Critical Appraisal tools for use in JBI Systematic Reviews

jbi.global

CRICOS Provider Number 00123M

INTRODUCTION

JBI is an international research organisation based in the Faculty of Health and Medical Sciences at the University of Adelaide, South Australia. JBI develops and delivers unique evidence-based information, software, education and training designed to improve healthcare practice and health outcomes. With over 70 Collaborating Entities, servicing over 90 countries, JBI is a recognised global leader in evidence-based healthcare.

JBI Systematic Reviews

The core of evidence synthesis is the systematic review of literature of a particular intervention, condition or issue. The systematic review is essentially an analysis of the available literature (that is, evidence) and a judgment of the effectiveness or otherwise of a practice, involving a series of complex steps. JBI takes a particular view on what counts as evidence and the methods utilised to synthesise those different types of evidence. In line with this broader view of evidence, JBI has developed theories, methodologies and rigorous processes for the critical appraisal and synthesis of these diverse forms of evidence in order to aid in clinical decision-making in healthcare. There now exists JBI guidance for conducting reviews of effectiveness research, qualitative research, prevalence/incidence, etiology/risk, economic evaluations, text/opinion, diagnostic test accuracy, mixed-methods, umbrella reviews and scoping reviews. Further information regarding JBI systematic reviews can be found in the [JBI Evidence Synthesis Manual](#).

JBI Critical Appraisal Tools

All systematic reviews incorporate a process of critique or appraisal of the research evidence. The purpose of this appraisal is to assess the methodological quality of a study and to determine the extent to which a study has addressed the possibility of bias in its design, conduct and analysis. All papers selected for inclusion in the systematic review (that is – those that meet the inclusion criteria described in the protocol) need to be subjected to rigorous appraisal by two critical appraisers. The results of this appraisal can then be used to inform synthesis and interpretation of the results of the study. JBI Critical appraisal tools have been developed by the JBI and collaborators and approved by the JBI Scientific Committee following extensive peer review. Although designed for use in systematic reviews, JBI critical appraisal tools can also be used when creating Critically Appraised Topics (CAT), in journal clubs and as an educational tool.

JBI CRITICAL APPRAISAL CHECKLIST FOR STUDIES REPORTING PREVALENCE DATA

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear	Not applicable
1. Was the sample frame appropriate to address the target population?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were study participants sampled in an appropriate way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was the sample size adequate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the study subjects and the setting described in detail?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Was the data analysis conducted with sufficient coverage of the identified sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were valid methods used for the identification of the condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Was the condition measured in a standard, reliable way for all participants?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Was there appropriate statistical analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

JBI CRITICAL APPRAISAL CHECKLIST FOR STUDIES REPORTING PREVALENCE DATA

How to cite: Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and incidence data. Int J Evid Based Healthc. 2015;13(3):147–153.

Answers: Yes, No, Unclear or Not/Applicable

1. Was the sample frame appropriate to address the target population?

This question relies upon knowledge of the broader characteristics of the population of interest and the geographical area. If the study is of women with breast cancer, knowledge of at least the characteristics, demographics and medical history is needed. The term “target population” should not be taken to infer every individual from everywhere or with similar disease or exposure characteristics. Instead, give consideration to specific population characteristics in the study, including age range, gender, morbidities, medications, and other potentially influential factors. For example, a sample frame may not be appropriate to address the target population if a certain group has been used (such as those working for one organisation, or one profession) and the results then inferred to the target population (i.e. working adults). A sample frame may be appropriate when it includes almost all the members of the target population (i.e. a census, or a complete list of participants or complete registry data).

2. Were study participants recruited in an appropriate way?

Studies may report random sampling from a population, and the methods section should report how sampling was performed. Random probabilistic sampling from a defined subset of the population (sample frame) should be employed in most cases, however, random probabilistic sampling is not needed when everyone in the sampling frame will be included/analysed. For example, reporting on all the data from a good census is appropriate as a good census will identify everybody. When using cluster sampling, such as a random sample of villages within a region, the methods need to be clearly stated as the precision of the final prevalence estimate incorporates the clustering effect. Convenience samples, such as a street survey or interviewing lots of people at a public gatherings are not considered to provide a representative sample of the base population.

3. Was the sample size adequate?

The larger the sample, the narrower will be the confidence interval around the prevalence estimate, making the results more precise. An adequate sample size is important to ensure good precision of the final estimate. Ideally we are looking for evidence that the authors conducted a sample size calculation to determine an adequate sample size. This will estimate how many subjects are needed to produce a reliable estimate of the measure(s) of interest. For conditions with a low prevalence, a larger sample size is needed. Also consider sample sizes for subgroup (or characteristics) analyses, and whether these are appropriate. Sometimes, the study will be large enough (as in large national surveys) whereby a sample size calculation is not required. In these cases, sample size can be considered adequate.

When there is no sample size calculation and it is not a large national survey, the reviewers may consider conducting their own sample size analysis using the following formula: (Naing et al. 2006, Daniel 1999)

$$n = \frac{Z^2 P(1-P)}{d^2}$$

d²

Where:

n = sample size

Z = Z statistic for a level of confidence

P = Expected prevalence or proportion (in proportion of one; if 20%, P = 0.2)

d = precision (in proportion of one; if 5%, d=0.05)

Ref:

Naing L, Winn T, Rusli BN. Practical issues in calculating the sample size for prevalence studies Archives of Orofacial Sciences. 2006;1:9-14.

Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences.

Edition. 7th ed. New York: John Wiley & Sons. 1999.

4. Were the study subjects and setting described in detail?

Certain diseases or conditions vary in prevalence across different geographic regions and populations (e.g. Women vs. Men, sociodemographic variables between countries). The study sample should be described in sufficient detail so that other researchers can determine if it is comparable to the population of interest to them.

5. Was data analysis conducted with sufficient coverage of the identified sample?

Coverage bias can occur when not all subgroups of the identified sample respond at the same rate. For instance, you may have a very high response rate overall for your study, but the response rate for a certain subgroup (i.e. older adults) may be quite low.

6. Were valid methods used for the identification of the condition?

Here we are looking for measurement or classification bias. Many health problems are not easily diagnosed or defined and some measures may not be capable of including or excluding appropriate levels or stages of the health problem. If the outcomes were assessed based on existing definitions or diagnostic criteria, then the answer to this question is likely to be yes. If the outcomes were assessed using observer reported, or self-reported scales, the risk of over- or under-reporting is increased, and objectivity is compromised. Importantly, determine if the measurement tools used were validated instruments as this has a significant impact on outcome assessment validity.

7. Was the condition measured in a standard, reliable way for all participants?

Considerable judgment is required to determine the presence of some health outcomes. Having established the validity of the outcome measurement instrument (see item 6 of this scale), it is important to establish how the measurement was conducted. Were those involved in collecting data trained or educated in the use of the instrument/s? If there was more than one data collector, were they similar in terms of level of education, clinical or research experience, or level of responsibility in the piece of research being appraised? When there was more than one observer or collector, was there comparison of results from across the observers? Was the condition measured in the same way for all participants?

8. Was there appropriate statistical analysis?

Importantly, the numerator and denominator should be clearly reported, and percentages should be given with confidence intervals. The methods section should be detailed enough for reviewers to identify the analytical technique used and how specific variables were measured. Additionally, it is also important to assess the appropriateness of the analytical strategy in terms of the assumptions associated with the approach as differing methods of analysis are based on differing assumptions about the data and how it will respond.

9. Was the response rate adequate, and if not, was the low response rate managed appropriately?

A large number of dropouts, refusals or “not founds” amongst selected subjects may diminish a study’s validity, as can a low response rates for survey studies. The authors should clearly discuss the response rate and any reasons for non-response and compare persons in the study to those not in the study, particularly with regards to their socio-demographic characteristics. If reasons for non-response appear to be unrelated to the outcome measured and the characteristics of non-responders are comparable to those who do respond in the study (addressed in question 5, coverage bias), the researchers may be able to justify a more modest response rate.