Systematic reviews in orthodontics: Impact of the PRISMA for Abstracts checklist on completeness of reporting

Jenny Vásquez-Cárdenas,[a] Óscar Zapata-Noreña,[a] Álvaro Carvajal-Flórez,[a] Diana María Barbosa-Liz,[a] Nikolaos Nikitas Giannakopoulos,[b] and Clovis Mariano Faggion, Jr[c]
Medellín, Colombia, and Würzburg, Münster, Germany

Introduction: This study evaluated and compared the completeness of reporting of abstracts of orthodontics systematic reviews before and after the publication of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Abstracts Checklist (PRISMA-A). **Methods:** Abstracts of systematic reviews and meta-analyses in orthodontics published in PubMed, Latin American and Caribbean Health Sciences Literature, and the Cochrane Database of Systematic Reviews databases before March 23, 2018, that met the predefined inclusion and exclusion criteria, were evaluated using the 12 items of PRISMA-A, scoring each item from 0 to 2. Abstracts were classified into 2 groups: before and after publication of the PRISMA-A checklist. Three calibrated evaluators (intraclass correlation coefficient and kappa > 0.8) assessed the scores for compliance with the checklist. The number of authors, country of affiliation of the first author, performance of meta-analysis, and topic of the article were recorded. A regression analysis was performed to assess the associations between abstract characteristics and the PRISMA-A scores. **Results:** Of 1034 abstracts evaluated, 389 were included in the analysis. The mean PRISMA-A score was 53.39 (95% CI, 51.83-54.96). The overall score for studies published after the publication of the checklist was significantly higher than for studies published before ($P \leq 0.0001$). The components returning significantly higher scores after publication of PRISMA-A were title ($P = 0.024$), information from databases ($P = 0.026$), risk of bias ($P \leq 0.0001$), included studies ($P \leq 0.0001$), synthesis of results ($P \leq 0.0001$), interpretation of results ($P = 0.035$), financing and conflict of interest ($P \leq 0.0001$), and registration ($P \leq 0.0001$). These results showed the positive effect of PRISMA-A had on the quality of reporting of orthodontics systematic reviews. Nevertheless, the poor adherence revealed that there is still need for improvement in the quality of abstract reporting. **Conclusions:** The quality of reporting of abstracts of orthodontic systematic reviews and meta-analyses increased after the introduction of PRISMA-A. (Am J Orthod Dentofacial Orthop 2019;156:442-52)

In orthodontics, as in other disciplines, clinicians need to evaluate the relevance of various types of published studies for decision making in daily practice. Publication of systematic reviews (SRs) has increased in recent years.[1-3] These reviews gather evidence that meets certain eligibility criteria, using systematic and explicit methods to reduce bias, and summarize the mass of available evidence to make it more useful to health professionals.[4,5] However, despite these efforts, SRs may exhibit limitations in terms of the quality of the included studies and erroneous results and conclusions; for this reason, not all SRs are reliable or of sufficient quality.[6,7] Therefore, high standards of reporting are needed to ensure proper assessment of the methodological quality of SRs.

Several tools have been developed to evaluate the completeness of reporting of SRs, and these have been validated and updated to improve their reliability and reproducibility.[7-9] One such tool is the Quality of Reporting of Meta-analyses statement (1999), which provides guidelines to improve the quality of reporting of meta-analyses of randomized clinical trials.[10] In 2009, the Preferred Reporting Items for Systematic

[a]Orthodontic Postgraduate Program, Gionorto Research Group, Faculty of Dentistry, University of Antioquia, Medellín, Colombia.
[b]Department of Prosthodontics, Faculty of Medicine, University of Würzburg, Würzburg, Germany.
[c]Department of Periodontology and Operative Dentistry, Faculty of Dentistry, University of Münster, Münster, Germany
All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.
Address correspondence to: Diana María Barbosa-Liz, Orthodontic Postgraduate Program, Faculty of Dentistry, University of Antioquia, Calle 70 #52-21, Medellín, Colombia; e-mail, dimabarbosa@gmail.com.
Submitted, December 2018; revised and accepted, May 2019.
0889-5406/$36.00

https://doi.org/10.1016/j.ajodo.2019.05.009

Reviews and Meta-Analyses (PRISMA) statement updated the Quality of Reporting of Meta-analyses statement, with conceptual and methodological enhancements for more effective reporting of SRs.[10]

The PRISMA checklist comprises 27 items, covering 4 key conceptual domains. The first of these relates to the management of a priori protocols as practiced by the Cochrane Collaboration. The second component is how the SR was performed, including an assessment of the risk of bias in the primary studies. The third component is the validity of the included primary studies, and the fourth relates to publication bias.[10] In 2013, an extension, the PRISMA for Abstracts Checklist (PRISMA-A) was published to guide structured elaboration of abstracts of SRs, focusing on the quality of reporting of abstracts.[11]

As the number of published SRs in orthodontics continues to increase, it is important to evaluate their quality. This includes the evaluation of structured and unstructured abstracts across an increasing number of databases. This topic has been addressed in a number of studies.[12-16] Authors, including Koletsi et al[17] and Papageorgiou et al,[18] have evaluated the general quality of SRs in orthodontics. Applying the Grading of Recommendations Assessment, Development and Evaluation guide, Koletsi et al[17] noted that the quality of meta-analyses scored from low to very low. Using A Measurement Tool to Assess Systematic Reviews checklist, Papageorgiou et al[18] observed that SRs in orthodontics, in general, were mainly of medium quality, and only 15.5% were of high quality. Although reporting guidelines and quality assessment tools exist, the reporting and methodological quality of SRs are inconsistent.[1] Furthermore, the quality of reporting of abstracts of SRs in orthodontics has not yet been evaluated.

Abstracts are the reader's first introduction to the information, and commonly determine whether the reader will proceed to read the full text. Nowadays, the diffusion of SRs occurs through the scientific abstract.[19] The quality of the abstract should reflect the quality of the research, otherwise, the reader may be discouraged from reading the entire text. Moreover, a well-written abstract ensures the proper indexation of the article and the ease of retrieval of the full text,[20] among other aspects.[21-23] Although the effect of PRISMA-A has been evaluated in respect of medical abstracts,[16] its effect on published orthodontic abstracts remains unknown. Therefore, the objectives of this research were to (1) evaluate and compare the quality of reporting of abstracts of SRs before and after publication of PRISMA-A, and (2) evaluate the association between the characteristics of abstracts and completeness of reporting as measured by PRISMA-A.

MATERIALS AND METHODS

Research question

The research question was as follows: What is the impact of PRISMA-A on the completeness of reporting of abstracts of SRs in orthodontics?

Type of study

A SR of available scientific literature was conducted.

Eligibility criteria

Articles with the term "systematic review" in their title, abstract, or full text, and subjects in the field of "orthodontics" were included, regardless of the year of publication. Articles in English, Spanish, and Portuguese, and those in which the authors explicitly declared an intention to conduct a SR (with or without a meta-analysis) were included. All other study types, such as narrative reviews, descriptive studies (eg, case reports, case series, and prevalence studies), analytic studies (eg, cases and controls, cross-sectional and cohort), experimental studies (eg, controlled and uncontrolled clinical trials), and duplicate publications were excluded.

Information sources

A systematic search of the literature was conducted independently and in duplicate by 2 authors (OZ and DB), using the following electronic databases: PubMed (last database inspection as of December 12, 2017), Latin American and Caribbean Health Sciences Literature (LILACS; as of March 16, 2018), and the Cochrane Database of Systematic Reviews (CDSR; as of March 25, 2018). In the case of the CDSR, only Cochrane reviews were searched. For logistical reasons, the searches in the databases were conducted on different dates. To build the search strategy, terms from medical subheadings were combined with Boolean operators (AND, OR, NOT) (Table I).

Selection of included studies

The included articles were selected by 3 reviewers following removal of duplicates. To begin, the reviewers (DB, OZ, and JV) evaluated the titles independently to determine their eligibility. In cases of disagreement, consensus was reached through discussion.

Data extraction

The following information was retrieved from the included abstracts: name of the searched database(s), the first author's reported country of affiliation, the number of authors, whether a meta-analysis was performed or

Table I. Search strategy for systematic reviews published in 3 selected databases

Databases	*Search strategy*
PubMed	#3. "Search""Orthodontics""[Mesh]",49157,10:35:11 #4. "Search Orthodontic*",64529,10:35:39 #5. "Search dentofacial orthopedics",1707,10:36:10 #7. "Search systematic review meta-analysis", 73791,10:37:15 #9. "Search""Review Literature as Topic""[Mesh]", 9470,10:38:07 #10. "Search ""Review""[Publication Type] ",2323030, 10:39:12 #11. "Search ""Meta-analysis""[Publication Type]", 82474,10:40:20 #14. "Search ""Meta-Analysis as Topic""[Mesh]", 16015,10:42:30 #15. "Search (((""Orthodontics""[Mesh]) OR Orthodontic*) OR dentofacial orthopedics",71684,10:43:17 #16. "Search (((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh]",125049,10:45:02 #17. "Search (((((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh])) AND (((""Orthodontics""[Mesh]) OR Orthodontic*) OR dentofacial orthopedics)",535, 10:47:42 #18. "Search (((((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh])) AND (((""Orthodontics""[Mesh]) OR Orthodontic*) OR dentofacial orthopedics) Filters: Humans",437,10:47:52 #20. "Search systematic review[Title/Abstract]", 101236,10:49:20 #21. "Search meta analysis[Title/Abstract]", 102622,10:50:17 #22. "Search ((((((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh])) OR systematic review[Title/Abstract]) OR meta analysis[Title/Abstract]",200581,10:51:42 #23. "Search (((((((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh])) OR systematic review[Title/Abstract]) OR metaanalysis[Title/Abstract])) AND (((""Orthodontics""[Mesh]) OR Orthodontic*) OR dentofacial orthopedics)",993,10:53:25 #24. "Search (((((((systematic review meta-analysis) OR ""Review Literature as Topic""[Mesh]) OR ""Meta-analysis""[Publication Type]) OR ""Meta-Analysis as Topic""[Mesh])) OR systematic review[Title/Abstract]) OR meta analysis[Title/Abstract])) AND (((""Orthodontics""[Mesh]) OR Orthodontic*) OR dentofacial orthopedics) Filters: Humans", 750,10:53:32
LILACS	revisión sistemática ortodoncia AND (instance: "regional") AND (db:("LILACS"))
CDSR	Date: March 25, 2018 Browse by topic Dentistry & oral health Craniofacial anomalies Orthodontic treatment (all dates)34 Published or updated within the last: all dates (34), 3 months (2), 6 months (4), 1 year (4), 2 years (11) Cochrane Review Group; Oral Health Group (33); Pain, Palliative and Supportive Care Group (1) Stage: Protocol (3), Review (31) Type: Intervention (34)

not, the abstract publication period group (before or after publication of PRISMA-A), and the type of SR (Cochrane/non-Cochrane). Data extraction was independently performed by the 3 reviewers (OZ, DB, and JV), and any disagreements were discussed until a consensus was achieved.

Training and calibration of assessors

Abstracts were independently evaluated by 3 reviewers (OZ, DB, and JV) following calibration using the PRISMA-A checklist.[11] To ensure homogeneity in the evaluation procedure, the theoretical calibration training involved reading each checklist item and discussing its meaning or purpose. Practical training involved individual application of the checklist to 10 abstracts that were not part of the studied sample. Disagreements between the reviewers were resolved through discussion. Calibration rounds were repeated with 10 different abstracts until sufficient inter-rater agreement was achieved. The kappa value for qualitative variables indicated excellent agreement (DB-OZ, 0.84), (DB-JV, 0.81), and the same was true of the intraclass correlation coefficient for quantitative variables (DB-OZ, 0.92), (DB-JV, 0.80).

Evaluation of completeness of reporting of included abstracts

The abstracts of the selected articles were evaluated using the PRISMA-A checklist, which comprises 12 items. The title should include the term SR, meta-analysis, or both. The context describes the objective, in which the author explains why the research was conducted, including the participant, intervention, comparison, and outcome question. In relation to the methodology, the checklist asks about the eligibility criteria, which should specify the study characteristics used as inclusion and exclusion criteria, as well as the

information sources indicating where the search was conducted and the last date of search. In addition, PRISMA-A evaluates and determines whether methods for assessing risk of bias and the results of included studies were reported, emphasizing the number and type of studies, the participants, and the key characteristics. The synthesis of results should also be reported, preferably indicating the number of studies and participants in each case. If a meta-analysis was performed, measures and confidence intervals (CI) should be specified. The description of effect (the direction and level of significance for patients and clinicians) must also be reported. The discussion must cover the strengths and limitations of the evidence and interpretation of the results. Finally, the main source of funding and the name and registration number should be reported. Abstracts that follow this checklist provide the reader with relevant information about the research in a coherent way and help the reader to decide whether to continue to the full text.

Each item was evaluated on a scale from 0 to 2, where 0 means that the item was not reported at all, 1 signifies that the item was only partially or inadequately reported, and 2 signifies that the item was fully reported. A higher score therefore denotes higher quality reporting, and the highest possible score is 24 points (Appendix 1).

A custom records form was created and evaluated in a pilot test in advance, including SRs that were not in the final sample.

Statistical analysis

To determine the distribution of the data, the Kolmogorov-Smirnov test was applied for quantitative variables. Non-normal distribution of the data was found, and nonparametric tests, which included the Mann-Whitney U test and Kruskal-Wallis test, were used. Qualitative variables were reported as frequencies and percentages.

To identify the characteristics associated with the mean score, a linear regression model was applied, and multivariate modeling was used to determine the adjusted effect on reporting completeness scores. The characteristics included in the model were database, country of affiliation, topic, meta-analysis, number of authors, and publication period group. As some of these characteristics are polytomous and others are dichotomous, group-by-group multivariable analysis was performed. R^2 estimates were registered for each category.

As the PRISMA-A checklist includes 12 items with a maximum score of 2 for each, the maximum possible score is 24 points, representing 100% fulfillment of the checklist. Based on Seehra et al,[15] a percentage was calculated for each item for each abstract to assess checklist completeness.

Mann-Whitney U and Kruskal-Wallis tests were used for comparison of PRISMA-A scores before and after the publication of the checklist. The level of statistical significance was established at $P \leq 0.05$. Statistical analysis was performed using SPSS (version 23.0; IBM, Armonk, NY).

RESULTS

Number of abstracts

In total, 1034 documents were initially retrieved. After discarding duplicates and evaluating article types and main topics, 411 abstracts were retained for further screening. Six abstracts were excluded on language criterion, and 6 more abstracts could not be found despite the endeavors of our librarian and efforts to contact the authors. A total of 389 abstracts of SRs were included in the final analysis. Further details are presented in the flow diagram in Figure, and in the list of references of included studies (Appendix 2).

Comparison of PRISMA-A scores for older (2013 and before) and newer (2014 and after) abstracts

The mean general PRISMA score was 53.39% (95% CI, 51.83%-54.96%). Statistically significant differences ($P \leq 0.0001$) were identified on comparing the percentage compliance for abstracts published before (mean score, 48.36%; 95% CI, 46.33%-50.40%) and after publication of PRISMA-A (mean score, 59.12%; 95% CI, 56.12%–61.20%). The more recent sample of abstracts had better scores. The last row of Table II reflects the difference in the overall score. Eight (67%) items exhibited statistically significant differences when PRISMA-A scores from older and newer abstracts were compared (Table II).

Table III shows the distribution of completeness as evaluated by the PRISMA-A checklist. The highest percentage compliance following publication of PRISMA-A related to title (87.4%), risk of bias (64.80%), eligibility criteria (53.80%), and studies included (50.50%). Table IV shows the distribution of the percentage compliance to PRISMA-A by number of authors and databases; the table shows that quality of reporting significantly increased with the number of authors ($P = 0.0001$). Cochrane reviews had the best overall score, with a statistically significant difference when compared with other reviews.

Description and association of the abstracts' characteristics and completeness of reporting (measured by the PRISMA-A scores)

Table V describes the general characteristics of the included studies, 87.9% of which were obtained from

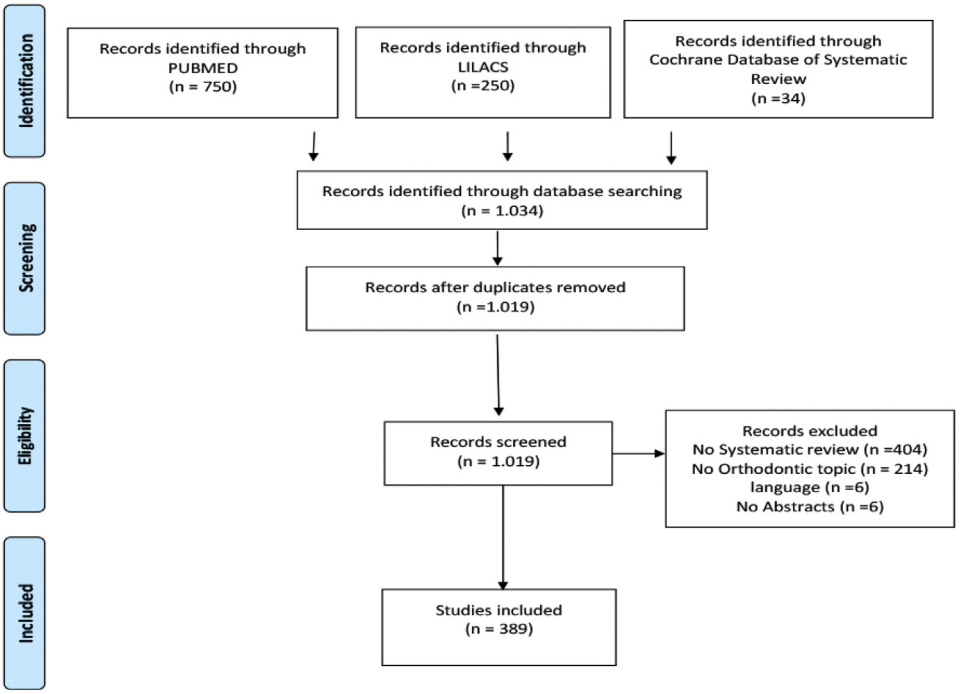

Fig. Flow diagram of studies considered for inclusion.

PubMed and 53.5% of the SRs were from Europe. The main subject of the abstracts related to orthodontic treatments in 47.6% of cases. Up to 2013, the median number of authors was 4, which increased to 5 after publication of the PRISMA-A checklist.

The independent variables used in the univariate and multivariate analyses were as follows: database, country of authorship, topic, number of authors, publication period group (before and after PRISMA-A), and meta-analysis or not (Table VI). Meta-analysis, the number of authors, and abstract publication period returned the highest estimate scores and explained 27% of the reporting quality. According to these analyses, abstracts with >5 authors published in Cochrane reviews after 2014 had significantly higher completeness of reporting scores.

DISCUSSION

Main findings

The main objective of this study was to evaluate and compare the quality of reporting of abstracts of SRs in orthodontics before and after publication of PRISMA-A. Abstracts published after the publication of the PRISMA-A checklist had significantly better completeness of reporting ($P \leq 0.0001$) than with those published before, especially for some of the items. The present results point toward the importance and impact of such checklists for improving the quality of published research. Nevertheless, there is still room for improvement. Other factors, such as increased number of authors, increase the quality of reporting significantly. The heterogeneity in quality between Cochrane and non-Cochrane SRs in orthodontics found in this paper has recently been also shown statistically.[24]

Comparison to other studies

To our knowledge, this is the first study to address the quality of reporting of abstracts in SRs in orthodontics using the PRISMA-A checklist. It is important to highlight that even though the introduction of this checklist has improved the reporting of the abstracts in orthodontic SRs (from 48% to 59%), adherence can still be improved for most of the items of this checklist. In SRs of other dental fields, using a 16-item checklist developed from the PRISMA guidelines,[25] the Cochrane Handbook for SRs of Interventions,[4] and the findings of Beller et al,[26] Kiriakou et al[14] evaluated the quality of reporting of abstracts in implantology journals alone and found a 72.5% mean overall reporting quality score. Applying the same checklist to the abstracts of SRs published in 7 leading dental specialty journals over a 4-year period (2008-2011), Seehra et al[15] reported that SRs from the *American Journal of Orthodontics and Dentofacial Orthopedics* showed a 74.36% mean overall reporting score. The mean reporting score of both

Table II. Comparison of percentage compliance of PRISMA-A items before and after the publication of the checklist

	2013 and before (n = 207)		*2014 and after (n = 182)*		*Total (N = 389)*		
Item	*Mean percent*	*95% CI*	*Mean percent*	*95% CI*	*Mean percent*	*95% CI*	*P value (before vs after)*
Title	78.98	73.41-84.56	87.63	82.84-92.43	83.03	79.30-86.76	0.024*
Objectives	61.11	57.35-64.86	60.71	57.24-64.17	60.92	58.36-63.48	0.748
Eligibility criteria	65.94	60.47-71.40	66.48	60.62-72.34	66.19	62.21-70.17	0.867
Information sources	63.28	58.09-68.47	72.25	67.48-77-02	67.48	63.48-71.04	0.026*
Risk of bias	44.68	37.87-51.49	65.10	58.14-72.07	54.24	49.28-59.20	0.000*
Included studies	61.11	56.90-65.32	72.25	67.80-76.70	66.32	63.33-69.41	0.000*
Synthesis of results	28.019	22.55-33.48	49.17	42.86-55.49	37.91	33.65-42.17	0.000*
Description of the effect	48.79	44.14-53.44	54.39	49.95-58.83	51.41	48.18-54.64	0.093
Strengths and limitations of evidence	26.32	22.40-30.25	31.31	26.95-35.68	28.66	25.74-31.58	0.100
Interpretation	61.35	57.40-62.61	67.30	62.85-71.76	64.13	61.17-67.09	0.035*
Funding and conflict of interest	29.95	25.09-34.81	56.04	50.62-61.46	42.15	38.32-45.99	0.000*
Registration	9.90	5.82-13.97	26.09	19.72-32.47	17.48	13.72-21.23	0.000*
Total Prisma-A score	48.36	46.33-50.40	59.12	56.12-61.2	53.39	51.83-54.96	0.000*

*Mann-Whitney U test: $P < 0.05$.

studies was higher than that for our overall sample (53.39%) and papers published before 2014 (48.36%). Possible reasons for this difference could be the use of different checklists (even if some of the items on the 16-item list were later included in the PRISMA-A), as well as the different time periods for the samples. The present PRISMA-A checklist was also used in a study of pediatric dentistry, which found that the abstracts had a moderate quality of reporting.[27] However, this study by Pulikkotil et al[27] included a very low number (N = 24) of SRs in the analysis, compared with our study (N = 386).

In other health science fields, different authors have tried to evaluate the quality of the abstract reporting in SRs. Bigna et al[16] evaluated the quality of reporting of abstracts of SRs published in high-impact general medicine journals and found that the mean number of items reported was higher and exhibited statistically significant differences in 2015 compared with items reported in 2012 ($P = 0.007$). These findings suggest that checklists have had an impact on the quality of reports in medical journals. In contrast, a study from the psychology field found that the reporting quality and completeness in abstracts of SRs and meta-analyses using the PRISMA-A has been suboptimal.[28]

Completeness of reporting before and after PRISMA-A checklist publication

In the sample of abstracts published before 2014, the following items appeared to yield the best score for reporting: title (78.98%), eligibility criteria (65.94%), and information source (63.28%). The ranking changed slightly after 2014 with the title remaining at the top (87.63%), followed by the information sources (67.48%), and the included studies (66.32%). Conversely, the worst items in terms of reporting, that is, synthesis of results, strengths, and limitations of evidence, and registration, stayed the same for both subsamples and did not exceed 50% mark.

In general, the quality of reporting of abstracts of SRs in medicine and dentistry journals has improved in recent years.[2,12] This is also evident in orthodontics from the improvement we found for the reporting of title, database information, risk of bias, included studies, synthesis of results, interpretation of results, funding, conflicts of interest, and registration in abstracts published after 2014. A PRISMA-A score of >50% was also reported in a sample of abstracts published in 2015 regarding the following items: titles, included studies, synthesis of results, and interpretation of results.[16]

Some items showed no significant change before and after the publication of PRISMA-A, such as the objective and eligibility criteria items, suggesting that authors have consistently identified these as key elements for abstracts. These findings align with those of a number of other previous studies,[14-16] suggesting that objectives and eligibility criteria are defined very early in the development of research. Furthermore, PRISMA-A checklist was found to have no impact on the description of effect, limitations, and strengths, as in Bigna et al,[16] indicating that authors have identified the importance of reporting these features in the abstract. It is possible that these items are more understandable for authors and are well reported. Page and Moher[5] suggested that

Table III. Distribution of compliance to items in PRISMA-A according to publication periods

PRISMA-A item	*Category**	*2013 and before n (%)*	*2014 and after n (%)*	*Total n (%)*
Title	0	43 (20.8)	22 (12.1)	65 (16.7)
	1	1 (0.5)	1 (0.5)	2 (0.5)
	2	163 (78.7)	159 (87.4)	322 (82.8)
Objective	0	13 (6.3)	5 (2.7)	18 (4.6)
	1	135 (65.2)	133 (73.1)	268 (68.9)
	2	59 (28.5)	44 (24.2)	103 (26.5)
Eligibility criteria	0	43 (20.8)	38 (20.8)	79 (20.4)
	1	55 (26.6)	46 (2.3)	101 (26.1)
	2	109 (52.7)	98 (53.8)	207 (53.5)
Information sources	0	39 (18.8)	16 (8.8)	55 (14.1)
	1	74 (35.7)	69 (37.9)	143 (36.8)
	2	94 (45.4)	97 (53.3)	191 (49.1)
Risk of bias	0	114 (55.1)	63 (34.6)	177 (45.5)
	1	1 (0.5)	1 (0.5)	2 (0.5)
	2	92 (44.4)	118 (64.8)	210 (54.0)
Included studies	0	21 (10.1)	11(6.0)	32 (8.2)
	1	119 (57.5)	79 (43.4)	198 (50.9)
	2	67 (32.4)	92 (50.5)	159 (40.9)
Synthesis of results	0	131 (63.3)	69 (37.9)	200 (51.4)
	1	36 (17.4)	47 (25.8)	83 (21.3)
	2	40 (19.3)	66 (36.3)	106 (27.2)
Description of the effect	0	50 (24.2)	26 (14.3)	76 (19.5)
	1	112 (54.1)	114 (62.6)	226 (58.1)
	2	45 (21.7)	42 (23.1)	87 (22.4)
Strengths and limitations of evidence	0	106 (51.2)	79 (43.4)	185 (47.6)
	1	93 (44.9)	92 (50.5)	185 (47.6)
	2	8 (3.9)	11 (6.0)	19 (4.9)
Interpretation	0	16 (7.7)	13 (7.1)	29 (7.5)
	1	128 (61.8)	93 (51.1)	221 (56.8)
	2	63 (30.4)	76 (41.8)	139 (35.7)
Funding and conflict of interest	0	110 (53.1)	40 (22.8)	150 (38.6)
	1	70 (33.8)	80 (44.0)	150 (38.6)
	2	27 (13.0)	62 (34.1)	89 (22.9)
Registration	0	186 (89.9)	133 (73.1)	319 (82.0)
	1	1 (0.5)	3 (1.6)	4 (1.0)
	2	20 (9.7)	46 (25.3)	66 (17.0)

*Category: 0 = not reported, 1 = partially or inadequately reported, and 2 = fully reported.

less complex checklist items (eg, identifying the report as an SR or meta-analysis in the title, providing a rationale and objectives, presenting study characteristics, and reporting conclusions) are better reported than the more complex ones (eg, the item that asks authors to describe methods used for assessing risk of bias of individual studies [including specification of whether this was done at the study or outcome level], and how this information is to be used in any data synthesis).

Association between abstracts' characteristics and completeness of reporting

Regarding the second objective of this research, different authors have investigated the factors that can affect the completeness of reporting of the abstract. It has been reported that the number of authors can directly influence reporting quality[14,17,29]; our finding that abstracts with >4 authors exhibit greater completeness of reporting aligns with the findings of Kiriakou et al.[14] Seehra et al[15] observed the same effect in studies with >5 authors. In addition, other studies have reported that having 6 or 7 authors, including a methodologist or a statistician, improves the reporting scores.[29] However, to the contrary, Bigna et al[16] found that the number of authors does not affect the quality of reporting in SRs from general medicine journals. This discrepancy might be explained through the increased number of SR authors observed in general medical journals (mean number of authors, 8.5 ± 5.4) when compared with dental journals (12% with >7 authors [mean score, 83.85; 95% CI, 79.9-87.7],[15] 12%

Table IV. Comparison of the compliance percentages of PRISMA-A according to the number of authors and databases

	Number of authors					*Database*						
	1-4 (n = 218)		*5-11 (n = 171)*		P *value*	*PubMed*		*LILACS*		*CDSR*		
PRISMA-A item	*Mean percent*	*95% CI*	*Mean percent*	*95% CI*	*Mann-Whitney U*	*Mean percent*	*95% CI*	*Mean percent*	*95% CI*	*Mean percent*	*95% CI*	P *value Kruskal-Wallis*
Title	84.17	79.3-89.0	81.57	75.7-87.4	0.49	90.35	43.2-94.2	68.75	43.2-94.2	9.67	1.35-20.7	0.000*,b,c
Objective	61.92	58.3-65.4	59.64	55.9-63.3	0.34	59.79	57.0-62.5	62.5	50.5-74.4	72.58	63.3-81.8	0.729
Eligibility criteria	65.13	59.8-70.4	67.54	61.5-73.5	0.50	63.88	59.5-68.2	59.37	41.9-76.8	95.16	98.6-100.6	0.466
Information sources	62.84	57.8-67.8	73.39	68.5-78.2	0.00*	64.47	60.6-68.3	68.75	52.2-85.2	100	0	0.001*,c
Risk of bias	47.01	40.3-53.6	63.45	56.1-70.7	0.00*	53.21	47.9-58.5	37.50	10.8-64.1	74.19	58.5-89.8	0.219
Included studies	61.46	57.2-65.6	72.51	68.0-76.9	0.00*	65.78	62.5-69.5	40.62	26.1-55.1	85.48	75.7-95.1	0.002*,a,b
Synthesis of results	35.32	29.7-40.9	41.22	34.6-47.7	0.18	35.96	31.4-40.4	15.62	2.8-28.3	70.96	55.4-86.5	0.80*,b
Description of the effect	49.54	45.1-53.8	53.80	48.9-58.6	0.20	51.02	47.6-54.4	43.75	30.4-57.0	59.67	45.9-73.4	0.368
Strengths and Limitations of evidence	25.91	22.1-29.6	32.16	27.5-36.7	0.05*	28.21	25.1-31.2	15.62	2.8-28.3	40.32	28.3-52.3	0.90
Interpretation	64.44	60.5-68.3	63.74	59.1-68.3	0.86	64.76	61.5-67.9	53.12	41.3-64.9	62.90	51.3-74.4	0.91
Funding and conflict of interest	33.25	28.3-38.1	53.50	47.8-59.1	0.00*	39.18	35.2-43.1	15.62	2.87-28.3	88.70	79.5-97.8	0.012*,b,c
Registration	12.15	7.8-16.5	24.26	17.8-30.6	0.00*	11.69	8.32-15.0	6.25	-7.07 to 19.5	87.09	74.5-99.5	0.000*,b,c
PRISMA score	50.35	48.1-52.5	57.28	55.1-59.4	0.00*	52.42	50.8-54.0	40.75	35.2-46.2	70.61	65.5-75.6	0.001*,b,c

Comparisons between the groups for the post-hoc test are marked in lowercase letters.
[a]significant difference found for the comparison between PubMed and Lilacs
[b]significant difference found for the comparison between Lilacs and CDSCR
[c]significant difference found for the comparison between PubMed and CDSCR
*$P < 0.05$.

Table V. Distribution and characteristics of the included abstracts according to the group allocation (before and after 2014)

Characteristic	*Category*	*2013 and before n (%)*	*2014 and after n (%)*	*Total n (%)*
Database	PubMed	180 (87)	162 (99)	342 (87.9)
	LILACS	9 (4.3)	7 (3.8)	16 (4.10)
	CDSR	18 (8.70)	13 (7.10)	31 (8.0)
Zone	NA	42 (20.3)	15 (8.2)	57 (14.7)
	LA	21 (10.1)	32 (17.6)	53 (13.6)
	Europe	114 (55.1)	94 (51.6)	208 (53.5)
	Asia	23 (11.10)	37 (20.3)	60 (15.4)
	Africa	6 (2.90)	3 (1.6)	9 (2.30)
	Oceania	1 (0.50)	1 (0.50)	2 (0.50)
Meta-analysis	Yes	58 (28.0)	69 (37.9)	127 (32.7)
	No	149 (72.0)	113 (62.1)	262 (67.4)
Author group	1-4	129 (62.3)	89 (48.9)	218 (56.0)
	5-11	78 (37.7)	93 (51.1)	171 (44.0)
Topic	Diagnosis	53 (25.6)	48 (26.4)	101 (26.0)
	Treatment	93 (44.9)	92 (50.5)	185 (47.6)
	Orthodontic materials	30 (14.5)	25 (13.7)	55 (14.1)
	Others	31 (15.0)	17 (9.30)	48 (12.3)

LA, Latin America; *NA*, North America.

Table VI. Univariable and multivariable linear regression-derived coefficients (β), 95% CIs, *P* values and R^2, with overall score as the dependent variable for the 389 SR abstract

		Univariable			*Multivariable*			
Characteristic	*Category*	*β*	*95% CI*	P *value*	*β*	*95% CI*	P *value*	R^2
Database	PubMed	Referent						0.126
	LILACS	−11.68	−19.1 to −4.22	0.002	−11.66	−19.0 to 4.26	0.002	
	CDSR	18.11	12.6-23.67	<0.000	41.54	26.0-57.02	<0.000	
Geographic zone	Europe	Referent						0.047
	LA	5.34	0.47-10.22	0.032	3.023	−0.39 to 11.08	0.285	
	NA	10.71	5.9-15.47	<0.000	8.40	4.16-12.63	<0.000	
	Asia	11.06	6.08-16.03	<0.000	8.73	3.31-14.10	0.001	
	Africa	13.02	3.37-22.67	<0.009	13.62	2.83-24.40	0.013	
	Oceanía	9.14	−12.78 to 31.07	0.413	17.67	−3.94 to 39.29	0.109	
Topic	Treatment	Referent						0.046
	Diagnosis	5.20	1.2-9.13	<0.010	−5.2	−8.95 to −1.4	0.07	
	Materials	3.9	−1.07 to 8.97	0.122	−1.25	−5.90 to 3.40	0.597	
	Others	−4.50	−9.58 to 0.581	0.082	−9.70	−14.6 to −4.79	<0.000	
Meta-analysis	Yes	Referent						
	No	−13.211	−16.3 to −10.1	<0.000	−12.06	-14.9 to −9.18	<0.000	
Number of authors	1-4	Referent						
	5-11	6.927	3.8-10.0	<0.000	5.40	2.67-8.14	<0.000	0.275
Allocation group	2013 and before	Referent			8.91			
	2014 and after	10.754	33.02-42.19	<0.000		6.18-11.64	<0.000	

LA, Latin America; *NA* North America.

with >5 authors [mean score, 77.9; 95% CI, 73.7-82.1],[14] and 44% with >5 authors [mean score, 57.2; 95% CI, 55.2-59.5] in our sample). One possible reason for the influence of the number of authors on the quality of reporting is the high level of precision and meticulousness required during an SR, which is perhaps more easily achieved when more authors share the responsibility and contribute to the adequate reporting of all items.

In terms of the included databases, the abstracts from the Cochrane SRs achieved the best PRISMA-A scores, and it is reasonable to infer that the greater methodological rigor of Cochrane protocols may have contributed to this effect.[30-32] Articles in the LILACS database returned the lowest scores, suggesting less rigor in abstract reporting; this may relate to the small number of SRs published in this database.

In relation to other abstract characteristics, our study shows that most SRs were carried out in Europe, in line with Papageorgiou et al,[18] and Kiriakou et al[14] and Seehra et al.[15] In partial agreement with our findings, Wasiak et al,[2] reported that most first authors were from the U.S. and Europe, in contrast with Bassani et al[33] who found that, in 2017, Brazil was the country with the most publications of SRs.[33] Meta-analysis was not performed in most studies, possibly because of the heterogeneity of data. Similar findings have been reported by other authors.[17,34-36]

Regression analysis

The regression analysis in the current study found that the main characteristics associated with better PRISMA-A scores were Cochrane review, publication after 2014, and participation of >5 authors; the latter is in line with the study of Seehra et al.[15] Although statistically significant differences were found in completeness of reporting across the included categories, the regression analysis explained 27% of the PRISMA-A score only for dichotomous variables. Regarding medical journals, Bigna et al[16] found that abstracts published in 2015 had better scores on the PRISMA-A checklist, and Tsou et al[19] found that word count is a weak predictor that only explained 13% of the variance in the PRISMA-A scores.

Strengths and limitations

The main strength of our study is the evaluation of a large number of orthodontic abstracts, which is larger than that used in previous studies.[15,16,29] The inclusion of a high number of SRs might present a clearer picture of the evolution of the quality of abstract reporting in orthodontics. In addition, the regression analysis allows us to identify some factors related to the improvement in the PRISMA-A score, such as the number of authors.

On the other hand, although the present findings indicate that completeness of reporting improved for abstracts published after the PRISMA-A checklist was introduced, there is no certainty that the checklist solely accounted for this improvement. Other factors may have influenced the quality of reporting, such as type of abstract (structured or nonstructured), word count, and impact factor. For example, structured abstracts and higher word count might allow more flexible reporting of the information, and SRs published in journals with a higher impact factor might be of higher quality.[37] The present study did not take account all possible factors; along with the limited number of databases used, this can be seen as a study limitation. Another possible limitation is the imbalance between non-Cochrane and Cochrane SRs, which was also reported by other authors in other dental fields[20] as well as in orthodontics,[17] preventing more robust conclusions about the influence of the type of review on PRISMA-A scores.

Clinical implications

Clinicians who are looking for complete scientific information related to orthodontics will likely search articles published after 2014. By using tools, such as PRISMA-A, SR authors can provide more comprehensive abstracts, which will help readers to decide whether to proceed to the full text and contribute to correct indexing of their work. The knowledge that the PRISMA-A checklist improves completeness of reporting may encourage authors to follow it, even if this is not required by the target journal. Editors of orthodontics journals should therefore endorse the use of this checklist to improve the standards of reporting.

CONCLUSIONS

PRISMA-A may contribute to improving the completeness of reporting of abstracts published in SRs in orthodontics.

ACKNOWLEDGMENTS

This study was supported by the Faculty of Dentistry, University of Antioquia. The authors thank Dr Luis Gonzalo Alvarez for helping with the statistical analysis.

REFERENCES

1. Pussegoda K, Turner L, Garritty C, Mayhew A, Skidmore B, Stevens A, et al. Systematic review adherence to methodological or reporting quality. Syst Rev 2017;6:131.

2. Wasiak J, Shen AY, Tan HB, Mahar R, Kan G, Khoo WR, et al. Methodological quality assessment of paper-based systematic reviews published in oral health. Clin Oral Investig 2016;20:399-431.
3. Millett D. Bias in systematic reviews? J Orthod 2011;38:158-60.
4. Higgins JPT, Green S, editors. Cochrane handbook for systematic reviews of interventions version 5.1.0. The Cochrane Collaboration; 2011; Available at: http://handbook-5-1.cochrane.org.
5. Page MJ, Moher D. Evaluations of the uptake and impact of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement and extensions: a scoping review. Syst Rev 2017;6:263.
6. Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol 2007;7:10.
7. Kung J, Chiappelli F, Cajulis OO, Avezova R, Kossan G, Chew L, et al. From systematic reviews to clinical recommendations for evidence-based health care: validation of Revised Assessment of Multiple Systematic Reviews (R-AMSTAR) for grading of clinical relevance. Open Dent J 2010;4:84-91.
8. Shea BJ, Bouter LM, Peterson J, Boers M, Andersson N, Ortiz Z, et al. External validation of a measurement tool to assess systematic reviews (AMSTAR). PLoS One 2007;2:e1350.
9. Wasiak J, Shen AY, Ware R, O'Donohoe TJ, Faggion CM Jr. Methodological quality and reporting of systematic reviews in hand and wrist pathology. J Hand Surg Eur 2017;42:852-6.
10. Urrútia G, Bonfill X. PRISMA declaration: a proposal to improve the publication of systematic reviews and meta-analyses. Med Clin (Barc) 2010;135:507-11.
11. Beller EM, Glasziou PP, Altman DG, Hopewell S, Bastian H, Chalmers I, et al. PRISMA for abstracts: reporting systematic reviews in journal and conference abstracts. PLoS Med 2013;10:e1001419.
12. Faggion CM Jr, Giannakopoulos NN. Quality of reporting in abstracts of randomized controlled trials published in leading journals of periodontology and implant dentistry: a survey. J Periodontol 2012;83:1251-6.
13. Faggion CM Jr, Giannakopoulos NN. Critical appraisal of systematic reviews on the effect of a history of periodontitis on dental implant loss. J Clin Periodontol 2013;40:542-52.
14. Kiriakou J, Pandis N, Fleming PS, Madianos P, Polychronopoulou A. Reporting quality of systematic review abstracts in leading oral implantology journals. J Dent 2013;41:1181-7.
15. Seehra J, Fleming PS, Polychronopoulou A, Pandis N. Reporting completeness of abstracts of systematic reviews published in leading dental specialty journals. Eur J Oral Sci 2013;121:57-62.
16. Bigna JJ, Um LN, Nansseu JR. A comparison of quality of abstracts of systematic reviews including meta-analysis of randomized controlled trials in high-impact general medicine journals before and after the publication of PRISMA extension for abstracts: a systematic review and meta-analysis. Syst Rev 2016;5:174.
17. Koletsi D, Fleming PS, Eliades T, Pandis N. The evidence from systematic reviews and meta-analyses published in orthodontic literature. Where do we stand? Eur J Orthod 2015;37:603-9.
18. Papageorgiou SN, Papadopoulos MA, Athanasiou AE. Evaluation of methodology and quality characteristics of systematic reviews in orthodontics. Orthod Craniofac Res 2011;14:116-37.
19. Tsou AY, Treadwell JR. Quality and clarity in systematic review abstracts: an empirical study. Res Synth Methods 2016;7:447-58.
20. Faggion CM Jr, Liu J, Huda F, Atieh M. Assessment of the quality of reporting in abstracts of systematic reviews with meta-analyses in periodontology and implant dentistry. J Periodontal Res 2014;49:137-42.
21. Flaherty RJ. A simple method for evaluating the clinical literature. Fam Pract Manag 2004;11:47-52.
22. Saint S, Christakis DA, Saha S, Elmore JG, Welsh DE, Baker P, et al. Journal reading habits of internists. J Gen Intern Med 2000;15:881-4.
23. Gutierrez-Ibarluzea I, Simpson S, Benguria-Arrate G, Members of EuroScan International Network. Early awareness and alert systems: an overview of EuroScan methods. Int J Technol Assess Health Care 2012;28:301-7.
24. Koletsi D, Fleming PS, Michelaki I, Pandis N. Heterogeneity in Cochrane and non-Cochrane meta-analyses in orthodontics. J Dent 2018;74:90-4.
25. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 2009;6:e1000100.
26. Beller EM, Glasziou PP, Hopewell S, Altman DG. Reporting of effect direction and size in abstracts of systematic reviews. JAMA 2011;306:1981-2.
27. Pulikkotil SJ, Jayaraman J, Nagendrababu V. Quality of abstract of systematic reviews and meta-analyses in paediatric dentistry journals. Eur Arch Paediatr Dent 2019; https://doi.org/10.1007/s40368-019-00432-w: [Epub ahead of print].
28. Rice DB, Kloda LA, Shrier I, Thombs BD. Reporting quality in abstracts of meta-analyses of depression screening tool accuracy: a review of systematic reviews and meta-analyses. BMJ Open 2016;6:e012867.
29. Fleming PS, Buckley N, Seehra J, Polychronopoulou A, Pandis N. Reporting quality of abstracts of randomized controlled trials published in leading orthodontic journals from 2006 to 2011. Am J Orthod Dentofacial Orthop 2012;142:451-8.
30. Petticrew M, Wilson P, Wright K, Song F. Quality of Cochrane reviews. Quality of Cochrane reviews is better than that of non-Cochrane reviews. BMJ 2002;324:545.
31. Wen J, Ren Y, Wang L, Li Y, Liu Y, Zhou M, et al. The reporting quality of meta-analyses improves: a random sampling study. J Clin Epidemiol 2008;61:770-5.
32. Faggion CM Jr, Aranda L, Pandis N, Alarcón MA, Diaz KT. Risk of bias over time in updates of Cochrane oral health reviews. J Dent 2019;80:63-8.
33. Bassani R, Pereira GKR, Page MJ, Tricco AC, Moher D, Sarkis-Onofre R. Systematic reviews in dentistry: current status, epidemiological and reporting characteristics. J Dent 2019;82:71-84.
34. Kakali L, Alharbi M, Pandis N, Gkantidis N, Kloukos D. Success of palatal implants or mini-screws placed median or paramedian for the reinforcement of anchorage during orthodontic treatment: a systematic review. Eur J Orthod 2019;41:9-20.
35. Al Ayyan W, Al Halabi M, Hussein I, Khamis AH, Kowash M. A systematic review and meta-analysis of primary teeth caries studies in Gulf Cooperation Council States. Saudi Dent J 2018;30:175-82.
36. Papadimitriou A, Mousoulea S, Gkantidis N, Kloukos D. Clinical effectiveness of Invisalign® orthodontic treatment: a systematic review. Prog Orthod 2018;19:37.
37. Fleming PS, Koletsi D, Seehra J, Pandis N. Systematic reviews published in higher impact clinical journals were of higher quality. J Clin Epidemiol 2014;67:754-9.

APPENDIX 1

PRISMA for Abstracts checklist

Title	*Checklist item*	*Reported on PAGE #*
1. Title:	Identify the report as a systematic review, meta-analysis, or both.	1
Background		
2. Objectives:	The research question including components such as participants, interventions, comparators, and outcomes.	1
Methods		
3. Eligibility criteria:	Study and report characteristics used as criteria for inclusion.	1
4. Information sources:	Key databases searched and search dates.	1
5. Risk of bias:	Methods of assessing risk of bias.	N/A
Results		
6. Included studies:	Number and type of included studies and participants and relevant characteristics of studies.	1
7. Synthesis of results:	Results for main outcomes (benefits and harms), preferably indicating the number of studies and participants for each. If meta-analysis was done, include summary measures and confidence intervals.	1
8. Description of the effect:	Direction of the effect (ie, which group is favored) and size of the effect in terms meaningful to clinicians and patients.	1
Discussion		
9. Strengths and Limitations of evidence:	Brief summary of strengths and limitations of evidence (eg, inconsistency, imprecision, indirectness, or risk of bias, other supporting or conflicting evidence)	N/A
10. Interpretation:	General interpretation of the results and important implications	1
Other		
11. Funding:	Primary source of funding for the review.	10
12. Registration:	Registration number and registry name.	No

N/A, Not applicable.

APPENDIX 2
REFERENCES FOR INCLUDED STUDIES

1. Abdullatif J, Certal V, Zaghi S, Song SA, Chang ET, Gillespie MB, et al. Maxillary expansion and maxillomandibular expansion for adult OSA: a systematic review and meta-analysis. J Craniomaxillofac Surg 2016;44:574-8.
2. Abreu LG, Paiva SM, Pordeus IA, Martins CC. Breastfeeding, bottle feeding and risk of malocclusion in mixed and permanent dentitions: a systematic review. Braz Oral Res 2016;30:1-21.
3. Afrand M, Ling CP, Khosrotehrani S, Flores-Mir C, Lagravère-Vich MO. Anterior cranial-base time-related changes: a systematic review. Am J Orthod Dentofacial Orthop 2014;146:21-32.e6.
4. Agostino P, Ugolini A, Signori A, Silvestrini-Biavati A, Harrison JE, Riley P. Orthodontic treatment for posterior crossbites. Cochrane Database Syst. Rev 2014;8:CD000979.
5. Ahrens A, McGrath C, Hagg U. A systematic review of the efficacy of oral appliance design in the management of obstructive sleep apnoea. Eur J Orthod 2011;33:318-24.
6. Ahrens A, McGrath C, Hägg U. Subjective efficacy of oral appliance design features in the management of obstructive sleep apnea: a systematic review. Am J Orthod Dentofacial Orthop 2010;138:559-76.
7. Alanko OME, Svedstrom-Oristo A-L, Tuomisto MT. Patients' perceptions of orthognathic treatment, well-being, and psychological or psychiatric status: a systematic review. Acta Odontol Scand 2010;68:249-60.
8. Alfawal AMH, Hajeer MY, Ajaj MA, Hamadah O, Brad B. Effectiveness of minimally invasive surgical procedures in the acceleration of tooth movement: a systematic review and meta-analysis. Prog Orthod 2016;17:33.
9. Alhadlaq AM. Biomarkers of orthodontic tooth movement in gingival crevicular fluid: a systematic review. J Contemp Dent Pract 2015;16:578-87.
10. Aljabaa A, McDonald F, Newton JT. A systematic review of randomized controlled trials of interventions to improve adherence among orthodontic patients aged 12-18. AngleOrthod 2015;85:305-13.
11. Al-Jewair TS. Meta-analysis on the mandibular dimensions effects of the MARA appliance in patients with class II malocclusions. Angle Orthod 2015;85:706-14.
12. Al-Jewair TS, Azarpazhooh A, Suri S, Shah PS. Computer-assisted learning in orthodontic education: a systematic review and meta-analysis. Dent Educ 2009;73:730-9.
13. Al-Makhmari S, Kaklamanos E, Athanasiou A. Short-term and long-term effectiveness of powered toothbrushes in promoting periodontal health during orthodontic treatment: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2017;152:753-66.e7.
14. Almeida NV, Silveira GS, Pereira DMT, Mattos CT, Mucha JN. Interproximal wear vs incisors extraction to solve anterior lower crowding: a systematic review. Dental Press J Orthod 2015;20:66-73.
15. Al-Moghrabi D, Pandis N, Fleming PS. The effects of fixed and removable orthodontic retainers: a systematic review. Prog Orthod 2016;17:24.
16. Al-Moghrabi D, Salazar FC, Pandis N, Fleming PS. Compliance with removable orthodontic appliances and adjuncts: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2017;152:17-32.
17. Alsafadi AS, Alabdullah MM, Saltaji H, Abdo A, Youssef M. Effect of molar intrusion with temporary anchorage devices in patients with anterior open bite: a systematic review. Prog Orthod 2016;17:9.
18. Al-Saleh MAQ, Alsufyani N, Flores-Mir C, Nebbe B, Major PW. Changes in temporomandibular joint morphology in class II patients treated with fixed mandibular repositioning and evaluated through 3D imaging: a systematic review. Orthod Craniofac Res 2015;18:185-201.
19. AlSamak S, Gkantidis N, Bitsanis E, Christou P. Assessment of potential orthodontic mini-implant insertion sites based on anatomical hard tissue parameters: a systematic review. Int J Oral Maxillofac Implants 2012;27:875-87.
20. Alsamak S, Psomiadis S, Gkantidis N. Positional guidelines for orthodontic mini-implant placement in the anterior alveolar region: a systematic review. Int J Oral Maxillofac Implants 2013;28:470-9.
21. Altmann ASP, Collares FM, Leitune VCB, Samuel SMW. The effect of antimicrobial agents on bond strength of orthodontic adhesives: a meta-analysis of in vitro studies. Orthod Craniofac Res 2016;19:1-9.
22. Alves MJ, Baratieri C, Araujo MTS, Souza MMG, Maia LC. Root damage associated with intermaxillary screws: a systematic review. Int J Oral Maxillofac Surg 2012;41:1445-50.
23. Alves MJ, Baratieri C, Mattos CT, Araujo MT, Maia LC. Root repair after contact with mini-implants: systematic review of the literature. Eur J Orthod 2013;35:491-9.
24. Amaya S, Navarrete G, Chaparro JPB, Godoy S, Prado E, Ramírez A. Efectividad del anclaje esquelético temporal para el cierre de espacios: revisión sistemática de literatura. Rev CESODontol 2011;24:49-58.
25. Andiappan M, Gao W, Bernabé E, Kandala N-B, Donaldson AN. Malocclusion, orthodontic treatment, and the Oral Health Impact Profile (OHIP-14): systematic review and meta-analysis. Angle Orthod 2015;85:493-500.
26. Andrade DCM, Loureiro CA, Araújo VE, Riera R, Atallah AN. Treatment for agenesis of maxillary lateral incisors: a systematic review. Orthod Craniofac Res 2013;16:129-36.
27. Angelo MF, Bertoni FC. Detecção automática de pontos cefalométricos: uma revisão crítica e sistemática. Heal Inf 2014;6:30-5.
28. Angelopoulou MV, Vlachou V, Halazonetis DJ. Pharmacological management of pain during orthodontic treatment: a meta-analysis. Orthod Craniofac Res 2012;15:71-83.
29. Antonarakis GS, Tsiouli K, Christou P. Mesiodistal tooth size in non-syndromic unilateral cleft lip and palate patients: a meta-analysis. Clin Oral Investig 2013;17:365-77.
30. Antonarakis GS, Kiliaridis S. Short-term anteroposterior treatment effects of functional appliances and extraoral traction on class II malocclusion. A meta-analysis. Angle Orthod 2007;77:907-14.
31. Antonarakis GS, Kiliaridis S. Maxillary molar distalization with noncompliance intramaxillary appliances in class II malocclusion. A systematic review. Angle Orthod 2008;78:1133-40.
32. Antoszewska-Smith J, Sarul M, Łyczek J, Konopka T, Kawala B. Effectiveness of orthodontic miniscrew implants in anchorage reinforcement during en-masse retraction: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2017;151:440-55.
33. Archambault A, Lacoursiere R, Badawi H, Major PW, Carey J, Flores-Mir C. Torque expression in stainless steel orthodontic brackets. A systematic review. Angle Orthod 2010;80:201-10.
34. Ata-Ali F, Ata-Ali J, Ferrer-Molina M, Cobo T, De Carlos F, Cobo J. Adverse effects of lingual and buccal orthodontic techniques: a

systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2016;149:820-9.
35. Atherton GJ, Glenny A-M, O'Brien K. Development and use of a taxonomy to carry out a systematic review of the literature on methods described to effect distal movement of maxillary molars. J Orthod 2002;29:211-6.
36. Austin SL, Mattick CR, Waterhouse PJ. Distraction osteogenesis versus orthognathic surgery for the treatment of maxillary hypoplasia in cleft lip and palate patients: a systematic review. Orthod Craniofac Res 2015;18:96-108.
37. Aziz T, Ansari K, Lagravere MO, Major MP, Flores-Mir C. Effect of non-surgical maxillary expansion on the nasal septum deviation: a systematic review. Prog Orthod 2015;16:15.
38. Baratieri C, Alves M, De Souza MMG, De Souza Araújo MT, Maia LC. Does rapid maxillary expansion have long-term effects on airway dimensions and breathing? Am J Orthod Dentofacial Orthop 2011;140:146-56.
39. Barlow M, Kula K. Factors influencing efficiency of sliding mechanics to close extraction space: a systematic review. Orthod Craniofac Res 2008;11:65-73.
40. Bartolucci ML, Bortolotti F, Raffaelli E, D'Anto V, Michelotti A, Alessandri Bonetti G. The effectiveness of different mandibular advancement amounts in OSA patients: a systematic review and meta-regression analysis. Sleep Breath 2016;20:911-9.
41. Batista KB, Thiruvenkatachari B, Harrison JE, O'Brien KD. Orthodontic treatment for prominent upper front teeth (class II malocclusion) in children and adolescents. Cochrane Database Syst Rev 2018;13:CD003452.
42. Benson PE, Shah AA, Millett DT, Dyer F, Parkin N, Vine RS. Fluorides, orthodontics and demineralization: a systematic review. J Orthod 2005;32:102-14.
43. Benson PE, Parkin N, Dyer F, Millett DT, Furness S, Germain P. Fluorides for the prevention of early tooth decay (demineralized white lesions) during fixed brace treatment. Cochrane Database Syst Rev 2013.
44. Bhujel N, Duggal MS, Saini P, Day PF. The effect of premature extraction of primary teeth on the subsequent need for orthodontic treatment. Eur Arch Paediatr Dent 2016;17:423-34.
45. Bichara LM, Araújo RC, Flores-Mir C, Normando D. Impact of primary palatoplasty on the maxillomandibular sagittal relationship in patients with unilateral cleft lip and palate: a systematic review and meta-analysis. Int J Oral Maxillofac Surg 2015;44:50-6.
46. Bock NC, von Bremen J, Ruf S. Stability of class II fixed functional appliance therapy—a systematic review and meta-analysis. Eur J Orthod 2016;38:129-39.
47. Bollen A-M. Effects of malocclusions and orthodontics on periodontal health: evidence from a systematic review. J Dent Educ 2008;72:912-8.
48. Bollen A-M, Cunha-Cruz J, Bakko DW, Huang GJ, Hujoel PP. The effects of orthodontic therapy on periodontal health: a systematic review of controlled evidence. J Am Dent Assoc 2008;139:413-22.
49. Bondemark L, Holm A-K, Hansen K, Axelsson S, Mohlin B, Brattstrom V, et al. Long-term stability of orthodontic treatment and patient satisfaction. A systematic review. Angle Orthod 2007;77:181-91.
50. Bondemark L, Lilja-Karlander E. A systematic review of Swedish research in orthodontics during the past decade. Acta Odontol Scand 2004;62:46-50.
51. Borrie F, Bearn D. Early correction of anterior crossbites: a systematic review. J Orthod 2011;38:175-84.
52. Borrie F, Bearn D, Innes N, Iheozor-Ejiofor Z. Interventions for the cessation of non-nutritive sucking habits in children. Cochrane Database Syst Rev 2015;3:CD008694.
53. Bratton DJ, Gaisl T, Schlatzer C, Kohler M. Comparison of the effects of continuous positive airway pressure and mandibular advancement devices on sleepiness in patients with obstructive sleep apnoea: a network meta-analysis. Lancet Respir Med 2015;3:869-78.
54. Bratton DJ, Gaisl T, Wons AM, Kohler M. CPAP vs mandibular advancement devices and blood pressure in patients with obstructive sleep apnea: a systematic review and meta-analysis. JAMA 2015;314:2280-93.
55. Bronfman CN, Janson G, Pinzan A, Rocha TL. Cephalometric norms and esthetic profile preference for the Japanese: a systematic review. Dental Press J Orthod 2015;20:43-51.
56. Brons S, van Beusichem ME, Bronkhorst EM, Draaisma JM, Bergé SJ, Schols JG, et al. Methods to quantify soft tissue–based cranial growth and treatment outcomes in children: a systematic review. PLoS One 2014;9:e89602.
57. Brons S, van Beusichem ME, Bronkhorst EM, Draaisma J, Berge SJ, Maal TJ, et al. Methods to quantify soft-tissue based facial growth and treatment outcomes in children: a systematic review. PLoS One 2012;7:e41898.
58. Bucci R, D'Anto V, Rongo R, Valletta R, Martina R, Michelotti A. Dental and skeletal effects of palatal expansion techniques: a systematic review of the current evidence from systematic reviews and meta-analyses. J Oral Rehabil 2016;43:543-64.
59. Buj-Acosta C, Paredes-Gallardo V, Montiel-Company JM, Albaladejo A, Bellot-Arcís C. Predictive validity of the GOSLON Yardstick index in patients with unilateral cleft lip and palate: a systematic review. PLoS One 2017;12:e0178497.
60. Burke SP, Silveira AM, Goldsmith LJ, Yancey JM, Van Stewart A, Scarfe WC. A meta-analysis of mandibular intercanine width in treatment and postretention. Angle Orthod 1998;68:53-60.
61. Buwembo W, Luboga S. Moyer's method of mixed dentition analysis: a meta-analysis. Afr Health Sci 2004;4:63-6.
62. Camacho M, Chang ET, Song SA, Abdullatif J, Zaghi S, Pirelli P, et al. Rapid maxillary expansion for pediatric obstructive sleep apnea: a systematic review and meta-analysis. Laryngoscope 2017;127:1712-9.
63. Carvalho-Lobato P, Garcia VJ, Kasem K, Ustrell-Torrent JM, Tallón-Walton V, Manzanares-Céspedes MC. Tooth movement in orthodontic treatment with low-level laser therapy: a systematic review of human and animal studies. Photomed Laser Surg 2014;32:302-9.
64. Celar A, Schedlberger M, Dorfler P, Bertl M. Systematic review on self-ligating vs. conventional brackets: initial pain, number of visits, treatment time. J Orofac Orthop 2013;74:40-51.
65. Chadwick BL, Roy J, Knox J, Treasure ET. The effect of topical fluorides on decalcification in patients with fixed orthodontic appliances: a systematic review. Am J Orthod Dentofacial Orthop 2005;128:601-6: quiz 670.
66. Chatzoudi MI, Ioannidou-Marathiotou I, Papadopoulos MA. Clinical effectiveness of chin cup treatment for the management of class III malocclusion in pre-pubertal patients: a systematic review and meta-analysis. Prog Orthod 2014;15:62.
67. Chen H, Liu X, Dai J, Jiang Z, Guo T, Ding Y. Effect of remineralizing agents on white spot lesions after orthodontic treatment: a systematic review. Am J Orthod Dentofacial Orthop 2013;143:376-82.e3.
68. Chen JY, Will LA, Niederman R. Analysis of efficacy of functional appliances on mandibular growth. Am J Orthod Dentofacial Orthop 2002;122:470-6.
69. Chen Q, Zheng X, Chen W, Ni Z, Zhou Y. Influence of orthodontic treatment with fixed appliances on enamel color: a systematic review. BMC Oral Health 2015;15:31.

70. Chen Y, Kyung HM, Zhao WT, Yu WJ. Critical factors for the success of orthodontic mini-implants: a systematic review. Am J Orthod Dentofacial Orthop 2009;135:284-91.
71. Cordasco G, Matarese G, Rustico L, Fastuca S, Caprioglio A, Lindauer SJ, et al. Efficacy of orthopedic treatment with protraction facemask on skeletal class III malocclusion: a systematic review and meta-analysis. Orthod Craniofac Res 2014;17:133-43.
72. Corrêa C, Bueno M, Lauris JRP, Berretin-Felix G, Corrêa C, Bueno M, et al. Interferência dos bicos ortodônticos e convencionais no sistema estomatognático: revisão sistemática. CoDAS 2016;28:182-9.
73. Cozza P, Baccetti T, Franchi L, De Toffol L, McNamara JAJ. Mandibular changes produced by functional appliances in class II malocclusion: a systematic review. Am J Orthod Dentofacial Orthop 2006;129:599.e1-12: discussion e1-6.
74. Cozza P, Mucedero M, Baccetti T, Franchi L. Early orthodontic treatment of skeletal open-bite malocclusion: a systematic review. Angle Orthod 2005;75:707-13.
75. Crismani AG, Bertl MH, Celar AG, Bantleon H-P, Burstone CJ. Miniscrews in orthodontic treatment: review and analysis of published clinical trials. Am J Orthod Dentofacial Orthop 2010;137:108-13.
76. da Costa Grec RH, Janson G, Branco NC, Moura-Grec PG, Patel MP, Henriques JFC. Intraoral distalizer effects with conventional and skeletal anchorage: a meta-analysis. Am J Orthod Dentofacial Orthop 2013;143:602-15.
77. Dalessandri D, Parrini S, Rubiano R, Gallone D, Migliorati M. Impacted and transmigrant mandibular canines incidence, aetiology, and treatment: a systematic review. Eur J Orthod 2017;39:161-9.
78. Dalessandri D, Salgarello S, Dalessandri M, Lazzaroni E, Piancino M, Paganelli C, et al. Determinants for success rates of temporary anchorage devices in orthodontics: a meta-analysis ($n > 50$). Eur J Orthod 2013;36:303-13.
79. D'Anto V, Bucci R, Franchi L, Rongo R, Michelotti A, Martina R. Class II functional orthopaedic treatment: a systematic review of systematic reviews. J Oral Rehabil 2015;42:624-42.
80. de Almeida VL, de Andrade Gois VL, Andrade RNM, Cesar CPHAR, de Albuquerque-Junior RLC, de Mello Rode S, et al. Efficiency of low-level laser therapy within induced dental movement: a systematic review and meta-analysis. J Photochem Photobiol B 2016;158:258-66.
81. de Gijt JP, Vervoorn K, Wolvius EB, Van der Wal KGH, Koudstaal MJ. Mandibular midline distraction: a systematic review. J Craniomaxillofac Surg 2012;40:248-60.
82. Derks A, Katsaros C, Frencken JE, van't Hof MA, Kuijpers-Jagtman AM. Caries-inhibiting effect of preventive measures during orthodontic treatment with fixed appliances. A systematic review. Caries Res 2004;38:413-20.
83. Dimberg L, Arnrup K, Bondemark L. The impact of malocclusion on the quality of life among children and adolescents: a systematic review of quantitative studies. Eur J Orthod 2015;37:238-47.
84. Do-Nascimento L, DeSouza M, Azevedo A, Maia L. Are self-ligating brackets related to less formation of Streptococcus mutans colonies? A systematic review. Dental Press J Orthod 2014;19:60-8.
85. Durão AR, Pittayapat P, Rockenbach MIB, Olszewski R, Ng S, Ferreira AP, et al. Validity of 2D lateral cephalometry in orthodontics: a systematic review. Prog Orthod 2013;14:31.
86. Ehsani S, Mandich M-A, El-Bialy TH, Flores-Mir C. Frictional resistance in self-ligating orthodontic brackets and conventionally ligated brackets. A systematic review. Angle Orthod 2009;79:592-601.
87. Ehsani S, Nebbe B, Normando D, Lagravere MO, Flores-Mir C. Short-term treatment effects produced by the Twin-block appliance: a systematic review and meta-analysis. Eur J Orthod 2015;37:170-6.
88. Eichenberger M, Erb J, Zwahlen M, Schatzle M. The timing of extraction of non-restorable first permanent molars: a systematic review. Eur J Paediatr Dent 2015;16:272-8.
89. El-Angbawi A, McIntyre GT, Fleming PS, Bearn DR. Non-surgical adjunctive interventions for accelerating tooth movement in patients undergoing fixed orthodontic treatment. Cochrane database Syst Rev 2015;CD010887.
90. Elhaddaoui R, Qoraich HS, Bahije L, Zaoui F. Orthodontic aligners and root resorption: a systematic review. Int Orthod 2017;15:1-12.
91. Fang J, Li Y, Zhang K, Zhao Z, Mei L. Escaping the adverse impacts of NSAIDs on tooth movement during orthodontics: current evidence based on a meta-analysis. Medicine (Baltimore) 2016;95:e3256.
92. Fau V, Diep D, Bader G, Brézulier D, Sorel O. Effectiveness of selective alveolar decortication in accelerating orthodontic treatment: a systematic review. Orthod Fr 2017;88:165-78.
93. Feldmann I, Bondemark L. Orthodontic anchorage: a systematic review. Angle Orthod 2006;76:493-501.
94. Feng X, Li J, Li Y, Zhao Z, Zhao S, Wang J. Effectiveness of TAD-anchored maxillary protraction in late mixed dentition. Angle Orthod 2012;82:1107-14.
95. Feres MFN, Raza H, Alhadlaq A, El-Bialy T. Rapid maxillary expansion effects in Class II malocclusion: a systematic review. Angle Orthod 2015;85:1070-9.
96. Finnema KJ, Ozcan M, Post WJ, Ren Y, Dijkstra PU. In-vitro orthodontic bond strength testing: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2010;137:615-22.e3.
97. Fleming PS, Marinho V, Johal A. Orthodontic measurements on digital study models compared with plaster models: a systematic review. Orthod Craniofac Res 2011;14:1-16.
98. Fleming PS, Eliades T, Katsaros C, Pandis N. Curing lights for orthodontic bonding: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2013;143:S92-103.
99. Fleming PS, Johal A. Self-ligating brackets in orthodontics. A systematic review. Angle Orthod 2010;80:575-84.
100. Fleming PS, Johal A, Pandis N. The effectiveness of laceback ligatures during initial orthodontic alignment: a systematic review and meta-analysis. Eur J Orthod 2013;35:539-46.
101. Fleming PS, Johal A, Pandis N. Self-etch primers and conventional acid-etch technique for orthodontic bonding: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2012;142:83-94.
102. Fleming PS, Strydom H, Katsaros C, MacDonald L, Curatolo M, Fudalej P, et al. Non-pharmacological interventions for alleviating pain during orthodontic treatment. Cochrane Database Syst Rev 2016;12:CD010263.
103. Fleming P, Fedorowicz Z, Johal A, El-Angbawi A, Pandis N. Surgical adjunctive procedures for accelerating orthodontic treatment. Cochrane Database Syst Rev 2015;6:CD010572.
104. Flores-Mir C, Ayeh A, Goswani A, Charkhandeh S. Skeletal and dental changes in class II division 1 malocclusions treated with splint-type Herbst appliances. A systematic review. Angle Orthod 2007;77:376-81.
105. Flores-Mir C, Korayem M, Heo G, Witmans M, Major MP, Major PW. Craniofacial morphological characteristics in children with obstructive sleep apnea syndrome: a systematic review and meta-analysis. J Am Dent Assoc 2013;144:269-77.
106. Flores-Mir C, Major MP, Major PW. Soft tissue changes with fixed functional appliances in class II division 1. Angle Orthod 2006;76:712-20.

107. Flores-Mir C, Major MP, Major PW. Search and selection methodology of systematic reviews in orthodontics (2000-2004). Am J Orthod Dentofacial Orthop 2006;130:214-7.
108. Flores-Mir C, Major PW. Cephalometric facial soft tissue changes with the twin block appliance in class II division 1 malocclusion patients. A systematic review. Angle Orthod 2006;76:876-81.
109. Flores-Mir C, Major PW. A systematic review of cephalometric facial soft tissue changes with the Activator and Bionator appliances in class II division 1 subjects. Eur J Orthod 2006;28: 586-93.
110. Flores-Mir C, Nebbe B, Major PW. Use of skeletal maturation based on hand-wrist radiographic analysis as a predictor of facial growth: a systematic review. Angle Orthod 2004;74:118-24.
111. Forst D, Nijjar S, Khaled Y, Lagravere M, Flores-Mir C. Radiographic assessment of external root resorption associated with jackscrew-based maxillary expansion therapies: a systematic review. Eur J Orthod 2014;36:576-85.
112. Freitas AOA, Marquezan M, Nojima M, Alviano DS, Maia LC, Freitas AOA, et al. The influence of orthodontic fixed appliances on the oral microbiota: a systematic review. Dental Press J Orthod 2014;19:46-55.
113. Fricton J, Look JO, Wright E, Alencar FGPJ, Chen H, Lang M, et al. Systematic review and meta-analysis of randomized controlled trials evaluating intraoral orthopedic appliances for temporomandibular disorders. J Orofac Pain 2010;24:237-54.
114. Fudalej P, Antoszewska J. Are orthodontic distalizers reinforced with the temporary skeletal anchorage devices effective? Am J Orthod Dentofacial Orthop 2011;139:722-9.
115. Fudalej P, Dragan M, Wedrychowska-Szulc B. Prediction of the outcome of orthodontic treatment of class III malocclusions—a systematic review. Eur J Orthod 2011;33:190-7.
116. Galvão M, Dominguez GC, Tormin ST, Akamine A, Tortamano A, Fantini SM. Applicability of Moyers analysis in mixed dentition: a systematic review. Dental Press J Orthod 2013;18:100-5.
117. Ge MK, He WL, Chen J, Wen C, Yin X, Hu ZA, et al. Efficacy of low-level laser therapy for accelerating tooth movement during orthodontic treatment: a systematic review and meta-analysis. Lasers Med Sci 2015;30:1609-18.
118. Gesch D, Bernhardt O, Kirbschus A. Association of malocclusion and functional occlusion with temporomandibular disorders (TMD) in adults: a systematic review of population-based studies. Quintessence Int 2004;35:211-21.
119. Gkantidis N, Christou P, Topouzelis N. The orthodontic-periodontic interrelationship in integrated treatment challenges: a systematic review. J Oral Rehabil 2010;37:377-90.
120. Gkantidis N, Mistakidis I, Kouskoura T, Pandis N. Effectiveness of non-conventional methods for accelerated orthodontic tooth movement: a systematic review and meta-analysis. Dent 2014; 42:1300-19.
121. Golan I, Baumert U, Hrala BP, Mussig D. Dentomaxillofacial variability of cleidocranial dysplasia: clinicoradiological presentation and systematic review. Dentomaxillofac Radiol 2003;32: 347-54.
122. Golz L, Papageorgiou SN, Jager A. Nickel hypersensitivity and orthodontic treatment: a systematic review and meta-analysis. Contact Dermatitis 2015;73:1-14.
123. Golz L, Reichert C, Jager A. Gingival invagination—a systematic review. J Orofac Orthop 2011;72:409-20.
124. Gomes L, Horta KOC, Gonçalves JR, Santos-Pinto A. Systematic review: craniocervical posture and craniofacial morphology. Eur J Orthod 2013;36:55-66.
125. Gómez M, Herrera Luz E, Suárez Á, Sánchez G. Efectividad de la retención post ortodoncia en pacientes de 12-35 años relacionada con 2 tipos de retención fija. Revisión sistemática de la literatura. Odontoestomatologia 2017;19.
126. Gordon JM, Rosenblatt M, Witmans M, Carey JP, Heo G, Major PW, et al. Rapid palatal expansion effects on nasal airway dimensions as measured by acoustic rhinometry. A systematic review. Angle Orthod 2009;79:1000-7.
127. Greenlee GM, Huang GJ, Chen SS-H, Chen J, Koepsell T, Hujoel P. Stability of treatment for anterior open-bite malocclusion: a meta-analysis. Am J Orthod Dentofacial Orthop 2011;139: 154-69.
128. Guarda-Nardini L, Manfredini D, Mion M, Heir G, Marchese-Ragona R. Anatomically based outcome predictors of treatment for obstructive sleep apnea with intraoral splint devices: a systematic review of cephalometric studies. J Clin sleep Med 2015;11: 1327-34.
129. Guo J, Li C, Zhang Q, Wu G, Deacon SA, Chen J, et al. Secondary bone grafting for alveolar cleft in children with cleft lip or cleft lip and palate. Cochrane database Syst Rev 2011;CD008050.
130. Hafez HS, Shaarawy SM, Al-Sakiti AA, Mostafa YA. Dental crowding as a caries risk factor: a systematic review. Am J Orthod Dentofacial Orthop 2012;142:443-50.
131. Halimi A, Benyahia H, Bahije L, Adli H, Azeroual M-F, Zaoui F. A systematic study of the release of bisphenol A by orthodontic materials and its biological effects. Int Orthod 2016;14:399-417.
132. Halimi A, Benyahia H, Doukkali A, Azeroual M-F, Zaoui F. A systematic review of force decay in orthodontic elastomeric power chains. Int Orthod 2012;10:223-40.
133. Hamedi-Sangsari A, Chinipardaz Z, Carrasco L. Following surgically assisted rapid palatal expansion, do tooth-borne or bone-borne appliances provide more skeletal expansion and dental expansion? J Oral Maxillofac Surg 2017;75:2211-22.
134. Harrison JE, O'Brien KD, Worthington HV. Orthodontic treatment for prominent upper front teeth in children. In: Harrison JE, editor. Cochrane Database of Systematic Reviews. Chichester, UK: John Wiley & Sons, Ltd; 2007.
135. Hashish DI, Mostafa YA. Effect of lip bumpers on mandibular arch dimensions. Am J Orthod Dentofacial Orthop 2009;135:106-9.
136. Hassan AH, Al-Saeed SH, Al-Maghlouth BA, Bahammam MA, Linjawi AI, El-Bialy TH. Corticotomy-assisted orthodontic treatment. A systematic review of the biological basis and clinical effectiveness. Saudi Med J 2015;36:794-801.
137. He WL, Li CJ, Liu ZP, Sun JF, Hu ZA, Yin X, et al. Efficacy of low-level laser therapy in the management of orthodontic pain: a systematic review and meta-analysis. Lasers Med Sci 2013;28: 1581-9.
138. Henriques FP, Janson G, Henriques JFC, Pupulim DC. Effects of cervical headgear appliance: a systematic review. Dental Press J Orthod 2015;20:76-81.
139. Hermont AP, Martins CC, Zina LG, Auad SM, Paiva SM, Pordeus IA. Breastfeeding, bottle feeding practices and malocclusion in the primary dentition: a systematic review of cohort studies. Int J Environ Res Public Health 2015;12:3133-51.
140. Höchli D, Hersberger-Zurfluh M, Papageorgiou SN, Eliades T. Interventions for orthodontically induced white spot lesions: a systematic review and meta-analysis. Eur J Orthod 2016;39:cjw065.
141. Hoekema A, Stegenga B, De Bont LGM. Efficacy and co-morbidity of oral appliances in the treatment of obstructive sleep apnea-hypopnea: a systematic review. Crit Rev Oral Biol Med 2004;15: 137-55.
142. Hoekema A. Efficacy and comorbidity of oral appliances in the treatment of obstructive sleep apnea-hypopnea: a systematic review and preliminary results of a randomized trial. Sleep Breath 2006;10:102-3.

143. Homem M, Vieira-Andrade R, Falci S, Ramos-Jorge M, Marques L. Effectiveness of orofacial myofunctional therapy in orthodontic patients: a systematic review. Dental Press J Orthod 2014;19:94-9.
144. Hoogeveen E, Jansma J, Ren Y. Surgically facilitated orthodontic treatment: a systematic review. Am J Orthod Dentofacial Orthop 2014;145:S51-64.
145. Hu H, Li C, Li F, Chen J, Sun J, Zou S, et al. Enamel etching for bonding fixed orthodontic braces. Cochrane Database Syst Rev 2013;11:CD005516.
146. Hu Z, Yin X, Liao J, Zhou C, Yang Z, Zou S. The effect of teeth extraction for orthodontic treatment on the upper airway: a systematic review. Sleep Breath 2015;19:441-51.
147. Hua F, He H, Ngan P, Bouzid W. Prevalence of peg-shaped maxillary permanent lateral incisors: a meta-analysis. Am J Orthod Dentofacial Orthop 2013;144:97-109.
148. Huang CS, Hsu SS-P, Chen Y-R. Systematic review of the surgery-first approach in orthognathic surgery. Biomed J 2014;37:184-90.
149. Huber KL, Suri L, Taneja P. Eruption disturbances of the maxillary incisors: a literature review. J Clin Pediatr Dent 2008;32:221-30.
150. Hunt OT, Johnston CD, Hepper PG, Burden DJ. The psychosocial impact of orthognathic surgery: a systematic review. Am J Orthod Dentofacial Orthop 2001;120:490-7.
151. Hunt O, Burden D, Hepper P, Johnston C. The psychosocial effects of cleft lip and palate: a systematic review. Eur J Orthod 2005;27:274-85.
152. Huynh NT, Desplats E, Almeida FR. Orthodontics treatments for managing obstructive sleep apnea syndrome in children: a systematic review and meta-analysis. Sleep Med Rev 2016;25:84-94.
153. Iglesias-Linares A, Yanez-Vico R-M, Solano-Reina E, Torres-Lagares D, Gonzalez Moles MA. Influence of bisphosphonates in orthodontic therapy: systematic review. J Dent 2010;38:603-11.
154. Iliadi A, Kloukos D, Gkantidis N, Katsaros C, Pandis N. Failure of fixed orthodontic retainers: a systematic review. J Dent 2015;43:876-96.
155. Incerti-Parenti S, Checchi V, Ippolito DR, Gracco A, Alessandri-Bonetti G. Periodontal status after surgical-orthodontic treatment of labially impacted canines with different surgical techniques: a systematic review. Am J Orthod Dentofacial Orthop 2016;149:463-72.
156. Indriksone I, Jakobsone G. The upper airway dimensions in different sagittal craniofacial patterns: a systematic review. Stomatologija 2014;16:109-17.
157. Ioannidou-Marathiotou I, Zafeiriadis AA, Papadopoulos MA. Root resorption of endodontically treated teeth following orthodontic treatment: a meta-analysis. Clin Oral Investig 2013;17:1733-44.
158. Iodice G, Danzi G, Cimino R, Paduano S, Michelotti A. Association between posterior crossbite, masticatory muscle pain, and disc displacement: a systematic review. Eur J Orthod 2013;35:737-44.
159. Ishaq RAR, AlHammadi MS, Fayed MMS, El-Ezz AA, Mostafa Y. Fixed functional appliances with multibracket appliances have no skeletal effect on the mandible: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2016;149:612-24.
160. Jacob H, Buschang P, dos Santos-Pinto A. Class II malocclusion treatment using high-pull headgear with a splint: a systematic review. Dental Press J Orthod 2013;18:21.e1-7.
161. Jager A, Braumann B, Kim C, Wahner S. Skeletal and dental effects of maxillary protraction in patients with angle class III malocclusion. A meta-analysis. J Orofac Orthop 2001;62:275-84.
162. Jambi S, Thiruvenkatachari B, O'Brien KD, Walsh T. Orthodontic treatment for distalising upper first molars in children and adolescents. Cochrane Database Syst Rev 2013;10:CD008375.
163. Jambi S, Walsh T, Sandler J, Benson PE, Skeggs RM, O'Brien KD. Reinforcement of anchorage during orthodontic brace treatment with implants or other surgical methods. Cochrane Database Syst Rev 2014;8:CD005098.
164. Janiszewska-Olszowska J, Szatkiewicz T, Tomkowski R, Tandecka K, Grocholewicz K. Effect of orthodontic debonding and adhesive removal on the enamel—current knowledge and future perspectives—a systematic review. Med Sci Monit 2014;20:1991-2001.
165. Janson G, Sathler R, Fernandes TMF, Branco NCC, de Freitas MR. Correction of class II malocclusion with class II elastics: a systematic review. Am J Orthod Dentofacial Orthop 2013;143:383-92.
166. Janson G, Sathler R, Fernandes TMF, Zanda M, Pinzan A. Class II malocclusion occlusal severity description. J Appl Oral Sci 2010;18:397-402.
167. Javidi H, Vettore M, Benson PE. Does orthodontic treatment before the age of 18 years improve oral health-related quality of life? A systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2017;151:644-55.
168. Jian F, Lai W, Furness S, McIntyre G, Millett D, Hickman J, et al. Initial arch wires for tooth alignment during orthodontic treatment with fixed appliances. Cochrane Database Syst Rev 2013;4:CD007859.
169. Joss-Vassalli I, Grebenstein C, Topouzelis N, Sculean A, Katsaros C. Orthodontic therapy and gingival recession: a systematic review. Orthod Craniofac Res 2010;13:127-41.
170. Kaklamanos EG, Kalfas S. Meta-analysis on the effectiveness of powered toothbrushes for orthodontic patients. Am J Orthod Dentofacial Orthop 2008;133:187.e1-14.
171. Kalantar Motamedi MR, Heidarpour M, Siadat S, Kalantar Motamedi A, Bahreman AA. Orthodontic extraction of high-risk impacted mandibular third molars in close proximity to the mandibular canal: a systematic review. J Oral Maxillofac Surg 2015;73:1672-85.
172. Kalemaj Z, Debernardi CL, Buti J. Efficacy of surgical and non-surgical interventions on accelerating orthodontic tooth movement: a systematic review. Eur J Oral Implantol 2015;8:9-24.
173. Kapoor P, Kharbanda OP, Monga N, Miglani R, Kapila S. Effect of orthodontic forces on cytokine and receptor levels in gingival crevicular fluid: a systematic review. Prog Orthod 2014;15:65.
174. Katyal V, Pamula Y, Martin AJ, Daynes CN, Kennedy JD, Sampson WJ. Craniofacial and upper airway morphology in pediatric sleep-disordered breathing: Systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2013;143:20-30.e3.
175. Kawanichi LY, Suga U, Kruly PC, Fujimaki M, Provenzano M, Terada RSS. Patient satisfaction after orthodontic treatment: a systematic review. Brazilian Dent Sci 2017;20:76.
176. Khamashta-Ledezma L, Naini FB. Systematic review of changes in maxillary incisor exposure and upper lip position with Le Fort I type osteotomies with or without cinch sutures and/or VY closures. Int J Oral Maxillofac Surg 2014;43:46-61.
177. Kiliaridis S, Sidira M, Kirmanidou Y, Michalakis K. Treatment options for congenitally missing lateral incisors. Eur J Oral Implantol 2016;9(Suppl 1):S5-24.
178. Kim JH, Viana MA, Graber TM, Omerza FF, BeGole EA. The effectiveness of protraction face mask therapy: a meta-analysis. Am J Orthod Dentofacial Orthop 1999;115:675-85.
179. Kim M-R, Graber TM, Viana MA. Orthodontics and temporomandibular disorder: a meta-analysis. Am J Orthod Dentofacial Orthop 2002;121:438-46.
180. Kloukos D, Eliades T, Sculean A, Katsaros C. Indication and timing of soft tissue augmentation at maxillary and mandibular

incisors in orthodontic patients. A systematic review. Eur J Orthod 2014;36:442-9.
181. Kloukos D, Pandis N, Eliades T. Bisphenol-A and residual monomer leaching from orthodontic adhesive resins and polycarbonate brackets: a systematic review. Am J Orthod Dentofacial Orthop 2013;143:S104-12.
182. Koletsi D, Fleming PS, Eliades T, Pandis N. The evidence from systematic reviews and meta-analyses published in orthodontic literature. Where do we stand? Eur J Orthod 2015;37:603-9.
183. Kolokitha O-E, Kaklamanos EG, Papadopoulos MA. Prevalence of nickel hypersensitivity in orthodontic patients: a meta-analysis. Am J Orthod Dentofacial Orthop 2008;134:722.e1-12: discussion 722-3.
184. Korayem M, Flores-Mir C, Nassar U, Olfert K. Implant site development by orthodontic extrusion. A systematic review. Angle Orthod 2008;78:752-60.
185. Koretsi V, Chatzigianni A, Sidiropoulou S. Enamel roughness and incidence of caries after interproximal enamel reduction: a systematic review. Orthod Craniofac Res 2014;17:1-13.
186. Koretsi V, Zymperdikas VF, Papageorgiou SN, Papadopoulos MA. Treatment effects of removable functional appliances in patients with Class II malocclusion: a systematic review and meta-analysis. Eur J Orthod 2015;37:418-34.
187. Kragt L, Dhamo B, Wolvius EB, Ongkosuwito EM. The impact of malocclusions on oral health-related quality of life in children—a systematic review and meta-analysis. Clin Oral Investig 2016;20:1881-94.
188. Kuhn E, Schwarz EI, Bratton DJ, Rossi VA, Kohler M. Effects of CPAP and mandibular advancement devices on health-related quality of life in osa: a systematic review and meta-analysis. Chest 2017;151:786-94.
189. Kuijpers MAR, Vissink A, Ren Y, Kuijpers-Jagtman AM. The effect of antisialogogues in dentistry: a systematic review with a focus on bond failure in orthodontics. J Am Dent Assoc 2010;141:954-65.
190. Kuijpers MAR, Chiu Y-T, Nada RM, Carels CEL, Fudalej PS. Three-dimensional imaging methods for quantitative analysis of facial soft tissues and skeletal morphology in patients with orofacial clefts: a systematic review. PLoS One 2014;9:e93442.
191. Labanauskaite B, Jankauskas G, Vasiliauskas A, Haffar N. Implants for orthodontic anchorage. Meta-analysis. Stomatologija 2005;7:128-32.
192. Lagravere MO, Flores-Mir C. The treatment effects of Invisalign orthodontic aligners: a systematic review. J Am Dent Assoc 2005;136:1724-9.
193. Lagravere MO, Heo G, Major PW, Flores-Mir C. Meta-analysis of immediate changes with rapid maxillary expansion treatment. J Am Dent Assoc 2006;137:44-53.
194. Lagravere MO, Major PW, Flores-Mir C. Skeletal and dental changes with fixed slow maxillary expansion treatment: a systematic review. J Am Dent Assoc 2005;136:194-9.
195. Lagravere MO, Major PW, Flores-Mir C. Long-term skeletal changes with rapid maxillary expansion: a systematic review. Angle Orthod 2005;75:1046-52.
196. Lagravere MO, Major PW, Flores-Mir C. Long-term dental arch changes after rapid maxillary expansion treatment: a systematic review. Angle Orthod 2005;75:155-61.
197. Leite RA, Rodrigues JF, Sakima MT, Sakima T. Relationship between temporomandibular disorders and orthodontic treatment: a literature review. Dental Press J Orthod 2013;18:150-7.
198. Lentini-Oliveira D, Carvalho F, Qingsong Y, Junjie L, Saconato H, Machado M, et al. Orthodontic and orthopaedic treatment for anterior open bite in children. Cochrane database Syst Rev 2007;CD005515.
199. Lentini-Oliveira D, Carvalho F, Rodrigues C, Ye Q, Prado L, Prado G, et al. Orthodontic and orthopaedic treatment for anterior open bite in children. Cochrane Database Syst Rev 2014;CD005515.
200. Leonardi R, Annunziata A, Caltabiano M. Landmark identification error in posteroanterior cephalometric radiography. A systematic review. Angle Orthod 2008;78:761-5.
201. Leonardi R, Annunziata A, Licciardello V, Barbato E. Soft tissue changes following the extraction of premolars in nongrowing patients with bimaxillary protrusion. A systematic review. Angle Orthod 2010;80:211-6.
202. Li FJ, Zhang JY, Zeng XT, Guo Y. Low-level laser therapy for orthodontic pain: a systematic review. Lasers Med Sci 2015;30:1789-803.
203. Li F, Hu HK, Chen JW, Liu ZP, Li GF, He SS, et al. Comparison of anchorage capacity between implant and headgear during anterior segment retraction. Angle Orthod 2011;81:915-22.
204. Lim J, Lasserson TJ, Fleetham J, Wright J. Oral appliances for obstructive sleep apnoea. Cochrane database Syst Rev 2006;CD004435.
205. Lisboa C de O, Masterson D, da Motta AFJ, Motta AT. Reliability and reproducibility of three-dimensional cephalometric landmarks using CBCT: a systematic review. J Appl Oral Sci 2015;23:112-9.
206. Littlewood SJ, Millett DT, Doubleday B, Bearn DR, Worthington HV. Orthodontic retention: a systematic review. J Orthod 2006;33:205-12.
207. Littlewood S, Millett D, Doubleday B, DR B, Worthington H. Retention procedures for stabilising tooth position after treatment with orthodontic braces. Cochrane Database Syst Rev 2016.
208. Liu S, Xu T, Zou W. Effects of rapid maxillary expansion on the midpalatal suture: a systematic review. Eur J Orthod 2015;37:651-5.
209. Liu ZP, Li CJ, Hu HK, Chen JW, Li F, Zou SJ. Efficacy of short-term chincup therapy for mandibular growth retardation in class III malocclusion. Angle Orthod 2011;81:162-8.
210. Liu Z, McGrath C, Hagg U. The impact of malocclusion/orthodontic treatment need on the quality of life. A systematic review. Angle Orthod 2009;79:585-91.
211. Livas C, Pandis N, Ren Y. Time relevance, citation of reporting guidelines, and breadth of literature search in systematic reviews in orthodontics. Eur J Orthod 2015;37:183-7.
212. Livas C, Delli K. Subjective and objective perception of orthodontic treatment need: a systematic review. Eur J Orthod 2013;35:347-53.
213. Livas C, Delli K. Does orthodontic extraction treatment improve the angular position of third molars? A systematic review. J Oral Maxillofac Surg 2017;75:475-83.
214. Lombardo L, Setti S, Molinari C, Siciliani G. Intra-arch widths: a meta-analysis. Int Orthod 2013;11:177-92.
215. Long H, Pyakurel U, Wang Y, Liao L, Zhou Y, Lai W. Interventions for accelerating orthodontic tooth movement: a systematic review. Angle Orthod 2013;83:164-71.
216. Long H, Zhou Y, Pyakurel U, Liao L, Jian F, Xue J, et al. Comparison of adverse effects between lingual and labial orthodontic treatment: a systematic review. Angle Orthod 2013;83:1066-73.
217. Long H, Zhou Y, Xue J, Liao L, Ye N, Jian F, et al. The effectiveness of low-level laser therapy in accelerating orthodontic tooth movement: a meta-analysis. Lasers Med Sci 2015;30:1161-70.

218. Lopez Filho H, Maia L, Lau T, de Souza M, Maia L. Early vs late orthodontic treatment of tooth crowding by first premolar extraction: a systematic review. Angle Orthod 2015;85:510-7.
219. Lou L, Lagravere MO, Compton S, Major PW, Flores-Mir C. Accuracy of measurements and reliability of landmark identification with computed tomography (CT) techniques in the maxillofacial area: a systematic review. Oral Surgery. Oral Med Oral Pathol Oral Radiol Endodontology 2007;104:402-11.
220. Luu NS, Mandich M-A, Tieu LD, Kaipatur N, Flores-Mir C. The validity and reliability of mixed-dentition analysis methods: a systematic review. J Am Dent Assoc 2011;142:1143-53.
221. Luu NS, Nikolcheva LG, Retrouvey J-M, Flores-Mir C, El-Bialy T, Carey JP, et al. Linear measurements using virtual study models. Angle Orthod 2012;82:1098-106.
222. Machado E, Machado P, Cunali PA, Grehs RA. Ortodontia como fator de risco para disfunções temporomandibulares: uma revisão sistemática. Dental Press J Orthod 2010;15:e1-10.
223. Mai W, He J, Meng H, Jiang Y, Huang C, Li M, et al. Comparison of vacuum-formed and Hawley retainers: a systematic review. Am J Orthod Dentofacial Orthop 2014;145:720-7.
224. Mandall NA, Millett DT, Mattick CR, Hickman J, Macfarlane TV, Worthington HV. Adhesives for fixed orthodontic brackets. Cochrane database Syst Rev 2003;CD002282.
225. Mandall NA, Millett DT, Mattick CR, Hickman J, Worthington HV, Macfarlane TV. Orthodontic adhesives: a systematic review. J Orthod 2002;29:205-10: discussion 195.
226. Marquezan M, Mattos CT, Sant'Anna EF, de Souza MMG, Maia LC. Does cortical thickness influence the primary stability of miniscrews? A systematic review and meta-analysis. Angle Orthod 2014;84:1093-103.
227. Marsico E, Gatto E, Burrascano M, Matarese G, Cordasco G. Effectiveness of orthodontic treatment with functional appliances on mandibular growth in the short term. Am J Orthod Dentofacial Orthop 2011;139:24-36.
228. Martin-Camean A, Jos A, Camean AM, Solano E, Iglesias-Linares A. Genotoxic and cytotoxic effects and gene expression changes induced by fixed orthodontic appliances in oral mucosa cells of patients: a systematic review. Toxicol Mech Methods 2015;25:440-7.
229. Mattheeuws N, Dermaut L, Martens G. Has hypodontia increased in Caucasians during the 20th century? A meta-analysis. Eur J Orthod 2004;26:99-103.
230. Mavreas D, Athanasiou AE. Factors affecting the duration of orthodontic treatment: a systematic review. Eur J Orthod 2008;30:386-95.
231. Medeiros MA, Souza Júnior JRS, Menezes VA. Tratamento preventivo e interceptivo do apinhamento: revisão de literatura. J Bras Ortodon Ortop Facial 2003;168-73.
232. Meng M, Yang M, Lv C, Yang Q, Yang Z, Chen S. Effect of low-level laser therapy on relapse of rotated teeth: a systematic review of human and animal study. Photomed Laser Surg 2017;35:3-11.
233. Meursinge Reynders R, Ronchi L, Ladu L, Van Etten-Jamaludin F, Bipat S. Insertion torque and orthodontic mini-implants: a systematic review of the artificial bone literature. Proc Inst Mech Eng Part H J Eng Med 2013;227:1181-202.
234. Meursinge Reynders RA, Ronchi L, Ladu L, van Etten-Jamaludin F, Bipat S. Insertion torque and success of orthodontic mini-implants: a systematic review. Am J Orthod Dentofacial Orthop 2012;142:596-614.e5.
235. Meursinge Reynders R, Ladu L, Ronchi L, Di Girolamo N, de Lange J, Roberts N, et al. Insertion torque recordings for the diagnosis of contact between orthodontic mini-implants and dental roots: protocol for a systematic review. Syst Rev 2015;4:39.
236. Meursinge Reynders R, Ladu L, Ronchi L, Di Girolamo N, de Lange J, Roberts N, et al. Insertion torque recordings for the diagnosis of contact between orthodontic mini-implants and dental roots: a systematic review. Syst Rev 2016;5:50.
237. Meursinge Reynders R, Ronchi L, Ladu L, Di Girolamo N, de Lange J, Roberts N, et al. Barriers and facilitators to the implementation of orthodontic mini-implants in clinical practice: a protocol for a systematic review and meta-analysis. Syst Rev 2016;5:22.
238. Mickenautsch S, Yengopal V, Banerjee A. Retention of orthodontic brackets bonded with resin-modified GIC versus composite resin adhesives—a quantitative systematic review of clinical trials. Clin Oral Investig 2012;16:1-14.
239. Migliorati M, Isaia L, Cassaro A, Rivetti A, Silvestrini-Biavati F, Gastaldo L, et al. Efficacy of professional hygiene and prophylaxis on preventing plaque increase in orthodontic patients with multibracket appliances: a systematic review. Eur J Orthod 2015;37:297-307.
240. Mikulewicz M, Chojnacka K. Trace metal release from orthodontic appliances by in vivo studies: a systematic literature review. Biol Trace Elem Res 2010;137:127-38.
241. Millett DT, Glenny AM, Mattick CR, Hickman J, Mandall NA. Adhesives for fixed orthodontic bands. Cochrane database Syst Rev 2006;CD004485.
242. Millett DT, Cunningham SJ, O'Brien KD, Benson PE, de Oliveira CM. Treatment and stability of class II division 2 malocclusion in children and adolescents: a systematic review. Am J Orthod Dentofacial Orthop 2012;142:159-69.e9.
243. Millett DT, Mandall NA, Mattick RC, Hickman J, Glenny A-M. Adhesives for bonded molar tubes during fixed brace treatment. Cochrane database Syst Rev 2011;CD008236.
244. Millett D, Mandall N, Hickman J, Mattick R, Glenny A-M. Adhesives for fixed orthodontic bands. A systematic review. Angle Orthod 2009;79:193-9.
245. Millett D, Cunningham S, O'Brien K, Benson P, de Oliveira C. Orthodontic treatment for deep bite and retroclined upper front teeth in children. Cochrane Database Syst Rev 2018.
246. Millett D, Mandall N, Mattick R, Hickman J, Glenny A. Adhesives for bonded molar tubes during fixed brace treatment. Cochrane Database Syst Rev 2017.
247. Minami-Sugaya H, Lentini-Oliveira DA, Carvalho FR, Machado MA, Marzola C, Saconato H, et al. WITHDRAWN: Treatments for adults with prominent lower front teeth. Cochrane database Syst Rev 2018;5:CD006963.
248. Minami-Sugaya H, Lentini-Oliveira DA, Carvalho FR, Machado MA, Marzola C, Saconato H, et al. Treatments for adults with prominent lower front teeth. Cochrane Database Syst Rev 2012;CD006963.
249. Mohlhenrich SC, Modabber A, Steiner T, Mitchell DA, Holzle F. Heat generation and drill wear during dental implant site preparation: systematic review. Br J Oral Maxillofac Surg 2015;53:679-89.
250. Monk A, Harrison J, Worthington H, Teague A. Pharmacological interventions for pain relief during orthodontic treatment. Cochrane Database Syst Rev 2017;11:CD003976.
251. Morales-Fernández M, Iglesias-Linares A, Yañez-Vico RM, Mendoza-Mendoza A, Solano-Reina E. Bone- and dentoalveolar-anchored dentofacial orthopedics for Class III malocclusion: New approaches, similar objectives? Angle Orthod 2013;83:540-52.
252. Morgan AG, Owens J, Marshman Z, Rodd HD. The case report in 21st century child dental literature. Eur J Paediatr Dent 2008;9:145-8.

253. Mossey PA, Batra P, McIntyre GT. The parental dentocraniofacial phenotype-an orofacial clefting microform. Cleft Palate Craniofac J 2010;47:22-34.
254. Naoumova J, Kurol J, Kjellberg H. A systematic review of the interceptive treatment of palatally displaced maxillary canines. Eur J Orthod 2011;33:143-9.
255. Nascimento PL, Fernandes MTG, Figueiredo FED, Faria-E-Silva AL. Fluoride-releasing materials to prevent white spot lesions around orthodontic brackets: a systematic review. Braz Dent 2016;27:101-7.
256. Nazarali N, Altalibi M, Nazarali S, Major MP, Flores-Mir C, Major PW. Mandibular advancement appliances for the treatment of paediatric obstructive sleep apnea: a systematic review. Eur J Orthod 2015;37:618-26.
257. Ng J, Major PW, Flores-Mir C. True molar intrusion attained during orthodontic treatment: a systematic review. Am J Orthod Dentofacial Orthop 2006;130:709-14.
258. Ng J, Major PW, Heo G, Flores-Mir C. True incisor intrusion attained during orthodontic treatment: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2005;128:212-9.
259. Nguyen QV, Bezemer PD, Habets L, Prahl-Andersen B. A systematic review of the relationship between overjet size and traumatic dental injuries. Eur J Orthod 1999;21:503-15.
260. Nienkemper M, Handschel J, Drescher D. Systematic review of mini-implant displacement under orthodontic loading. Int J Oral Sci 2013;6:1.
261. Nollet PJPM, Katsaros C, Van't Hof MA, Kuijpers-Jagtman AM. Treatment outcome in unilateral cleft lip and palate evaluated with the GOSLON yardstick: a meta-analysis of 1236 patients. Plast Reconstr Surg 2005;116:1255-62.
262. Nucera R, Lo Giudice A, Rustico L, Matarese G, Papadopoulos MA, Cordasco G. Effectiveness of orthodontic treatment with functional appliances on maxillary growth in the short term: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2016;149:600-11.e3.
263. Ohashi E, Pecho OE, Moron M, Lagravere MO. Implant vs screw loading protocols in orthodontics. Angle Orthod 2006;76:721-7.
264. Okada E, Ribeiro L, Stuani M, Borsatto M, Fidalgo T, Paula-Silva F, et al. Effects of chlorhexidine varnish on caries during orthodontic treatment: a systematic review and meta-analysis. Braz Oral Res 2016;30:e115.
265. Pachêco-Pereira C, De Luca Canto G, Major PW, Flores-Mir C. Variation of orthodontic treatment decision-making based on dental model type: a systematic review. Angle Orthod 2015;85:501-9.
266. Pacheco-Pereira C, Pereira JR, Dick BD, Perez A, Flores-Mir C. Factors associated with patient and parent satisfaction after orthodontic treatment: a systematic review. Am J Orthod Dentofacial Orthop 2015;148:652-9.
267. Palomares NB, Bueno GN, Goldner MT, Mendes A. A influência das alterações hormonais no tratamento ortodôntico—Influence of hormonal alterations on orthodontic treatment. Rev Clín Ortod Dent Press 2014;13:41-50.
268. Pandis N, Fleming PS, Spineli LM, Salanti G. Initial orthodontic alignment effectiveness with self-ligating and conventional appliances: a network meta-analysis in practice. Am J Orthod Dentofacial Orthop 2014;145:S152-63.
269. Papadopoulos MA, Chatzoudi M, Kaklamanos EG. Prevalence of tooth transposition. A meta-analysis. Angle Orthod 2010;80.
270. Papadopoulos MA, Koumpridou EN, Vakalis ML, Papageorgiou SN. Effectiveness of pre-surgical infant orthopedic treatment for cleft lip and palate patients: a systematic review and meta-analysis. Orthod Craniofac Res 2012;15:207-36.
271. Papadopoulos MA, Papageorgiou SN, Zogakis IP. Clinical effectiveness of orthodontic miniscrew implants: a meta-analysis. J Dent Res 2011;90:969-76.
272. Papadopoulos MA, Chatzoudi M, Karagiannis V. Assessment of characteristic features and dental anomalies accompanying tooth transposition: a meta-analysis. Am J Orthod Dentofacial Orthop 2009;136:308.e1-10: discussion 308-9.
273. Papadopoulos MA, Gkiaouris I. A critical evaluation of meta-analyses in orthodontics. Am J Orthod Dentofacial Orthop 2007;131:589-99.e7.
274. Papageorgiou SN, Konstantinidis I, Papadopoulou K, Jäger A, Bourauel C. A systematic review and meta-analysis of experimental clinical evidence on initial aligning archwires and archwire sequences. Orthod Craniofac Res 2014;17:197-215.
275. Papageorgiou SN, Konstantinidis I, Papadopoulou K, Jager A, Bourauel C. Clinical effects of pre-adjusted edgewise orthodontic brackets: a systematic review and meta-analysis. Eur J Orthod 2014;36:350-63.
276. Papageorgiou SN, Golz L, Jager A, Eliades T, Bourauel C. Lingual vs. labial fixed orthodontic appliances: systematic review and meta-analysis of treatment effects. Eur J Oral Sci 2016;124:105-18.
277. Papageorgiou SN, Kutschera E, Memmert S, Golz L, Jager A, Bourauel C, et al. Effectiveness of early orthopaedic treatment with headgear: a systematic review and meta-analysis. Eur J Orthod 2017;39:176-87.
278. Papageorgiou SN, Zogakis IP, Papadopoulos MA. Failure rates and associated risk factors of orthodontic miniscrew implants: a meta-analysis. Am J Orthod Dentofacial Orthop 2012;142:577-95.e7.
279. Parkin N, Benson PE, Thind B, Shah A, Khalil I, Ghafoor S. Open versus closed surgical exposure of canine teeth that are displaced in the roof of the mouth. Cochrane Database Syst Rev 2017.
280. Parrini S, Rossini G, Castroflorio T, Fortini A, Deregibus A, Debernardi C. Laypeople's perceptions of frontal smile esthetics: a systematic review. Am J Orthod Dentofacial Orthop 2016;150:740-50.
281. Patterson BM, Dalci O, Darendeliler MA, Papadopoulou AK. Corticotomies and orthodontic tooth movement: a systematic review. J Oral Maxillofac Surg 2016;74:453-73.
282. Paulsson L, Bondemark L, Soderfeldt B. A systematic review of the consequences of premature birth on palatal morphology, dental occlusion, tooth-crown dimensions, and tooth maturity and eruption. Angle Orthod 2004;74:269-79.
283. Pazzini CA, Marques LS, Pereira LJ, Correa-Faria P, Paiva SM. Allergic reactions and nickel-free braces: a systematic review. Braz Oral Res 2011;25:85-90.
284. Peiro-Guijarro MA, Guijarro-Martinez R, Hernandez-Alfaro F. Surgery first in orthognathic surgery: a systematic review of the literature. Am J Orthod Dentofacial Orthop 2016;149:448-62.
285. Perillo L, Cannavale R, Ferro F, Franchi L, Masucci C, Chiodini P, et al. Meta-analysis of skeletal mandibular changes during Frankel appliance treatment. Eur J Orthod 2011;33:84-92.
286. Perinetti G, Primožič J, Castaldo A, Di Lenarda R, Contardo L. Is gingival crevicular fluid volume sensitive to orthodontic tooth movement? A systematic review of split-mouth longitudinal studies. Orthod Craniofac Res 2013;16:1-19.
287. Perinetti G, Primozic J, Franchi L, Contardo L. Treatment effects of removable functional appliances in pre-pubertal and pubertal class ii patients: a systematic review and meta-analysis of controlled studies. PLoS One 2015;10:e0141198.
288. Perinetti G, Primožič J, Furlani G, Franchi L, Contardo L. Treatment effects of fixed functional appliances alone or in

combination with multibracket appliances: a systematic review and meta-analysis. Angle Orthod 2015;85:480-92.
289. Perinetti G, Primozic J, Manfredini D, Di Lenarda R, Contardo L. The diagnostic potential of static body-sway recording in orthodontics: a systematic review. Eur J Orthod 2013;35:696-705.
290. Perinetti G, Westphalen GH, Biasotto M, Salgarello S, Contardo L. The diagnostic performance of dental maturity for identification of the circumpubertal growth phases: a meta-analysis. Prog Orthod 2013;14:8.
291. Petren S, Bondemark L, Soderfeldt B. A systematic review concerning early orthodontic treatment of unilateral posterior crossbite. Angle Orthod 2003;73:588-96.
292. Phan M, Conte F, Khandelwal KD, Ockeloen CW, Bartzela T, Kleefstra T, et al. Tooth agenesis and orofacial clefting: genetic brothers in arms? Hum Genet 2016;135:1299-327.
293. Piassi E, Antunes LS, Antunes LAA. Orthodontic treatment reduces the impact on children and adolescents' oral health-related quality of life. Indian J Dent Res 2016;27:213-9.
294. Pisani L, Bonaccorso L, Fastuca R, Spena R, Lombardo L, Caprioglio A. Systematic review for orthodontic and orthopedic treatments for anterior open bite in the mixed dentition. Prog Orthod 2016;17:28.
295. Pithon MM, Sant'Anna LIDA, Baião FCS, dos Santos RL, da Silva Coqueiro R, Maia LC. Assessment of the effectiveness of mouthwashes in reducing cariogenic biofilm in orthodontic patients: a systematic review. J Dent 2015;43:297-308.
296. Pithon MM, Santos RL, Araújo MT, Maia LC. Orthodontic mini-implants: are they a good anchorage resource for cases of retraction after extraction? Int J Odontostomatol 2012;6:369-74.
297. Pittayapat P, Limchaichana-Bolstad N, Willems G, Jacobs R. Three-dimensional cephalometric analysis in orthodontics: a systematic review. Orthod Craniofac Res 2014;17:69-91.
298. Pizzo G, Licata ME, Guiglia R, Giuliana G. Root resorption and orthodontic treatment. Review of the literature. Minerva Stomatol 2007;56:31-44.
299. Plooij JM, Maal TJJ, Haers P, Borstlap WA, Kuijpers-Jagtman AM, Berge SJ. Digital three-dimensional image fusion processes for planning and evaluating orthodontics and orthognathic surgery. A systematic review. Int J Oral Maxillofac Surg 2011;40:341-52.
300. Popowich K, Nebbe B, Major PW. Effect of Herbst treatment on temporomandibular joint morphology: a systematic literature review. Am J Orthod Dentofacial Orthop 2003;123:388-94.
301. Rakhshan V. Meta-analysis and systematic review of factors biasing the observed prevalence of congenitally missing teeth in permanent dentition excluding third molars. Prog Orthod 2013;14:33.
302. Rakhshan V, Rakhshan A. Systematic review and meta-analysis of congenitally missing permanent dentition: Sex dimorphism, occurrence patterns, associated factors and biasing factors. Int Orthod 2016;14:273-94.
303. Rakhshan V, Rakhshan H. Meta-analysis and systematic review of the number of non-syndromic congenitally missing permanent teeth per affected individual and its influencing factors. Eur J Orthod 2016;38:170-7.
304. Ren C, McGrath C, Yang Y. The effectiveness of low-level diode laser therapy on orthodontic pain management: a systematic review and meta-analysis. Lasers Med Sci 2015;30:1881-93.
305. Ren Y, Maltha JC, Kuijpers-Jagtman AM. Optimum force magnitude for orthodontic tooth movement: a systematic literature review. Angle Orthod 2003;73:86-92.
306. Reynders R, Ronchi L, Bipat S. Mini-implants in orthodontics: a systematic review of the literature. Am J Orthod Dentofacial Orthop 2009;135:564.e1-19: discussion 564-5.
307. Riley M, Bearn DR. A systematic review of clinical trials of aligning archwires. J Orthod 2009;36:42-51: discussion 15.
308. Rischen RJ, Breuning KH, Bronkhorst EM, Kuijpers-Jagtman AM. records needed for orthodontic diagnosis and treatment planning: a systematic review. PLoS One 2013;8:e74186.
309. Rodríguez de Guzmán-Barrera J, Sáez Martínez C, Boronat-Catalá M, Montiel-Company JM, Paredes-Gallardo V, Gandía-Franco JL, et al. Effectiveness of interceptive treatment of class III malocclusions with skeletal anchorage: a systematic review and meta-analysis. PLoS One 2017;12:e0173875.
310. Rodriguez JC, Suarez F, Chan H-L, Padial-Molina M, Wang H-L. Implants for orthodontic anchorage: success rates and reasons of failures. Implant Dent 2014;23:155-61.
311. Rogers S, Chadwick B, Treasure E. Fluoride-containing orthodontic adhesives and decalcification in patients with fixed appliances: a systematic review. Am J Orthod Dentofacial Orthop 2010;138:390.e1-8.
312. Roscoe MG, Meira JBC, Cattaneo PM. Association of orthodontic force system and root resorption: a systematic review. Am J Orthod Dentofacial Orthop 2015;147:610-26.
313. Rossini G, Parrini S, Castroflorio T, Deregibus A, Debernardi CL. Efficacy of clear aligners in controlling orthodontic tooth movement: a systematic review. Angle Orthod 2015;85:881-9.
314. Rossini G, Parrini S, Castroflorio T, Deregibus A, Debernardi CL. Diagnostic accuracy and measurement sensitivity of digital models for orthodontic purposes: a systematic review. Am J Orthod Dentofacial Orthop 2016;149:161-70.
315. Rossini G, Parrini S, Castroflorio T, Deregibus A, Debernardi CL. Periodontal health during clear aligners treatment: a systematic review. Eur J Orthod 2015;37:539-43.
316. Rotundo R, Bassarelli T, Pace E, Iachetti G, Mervelt J, Pini Prato G. Orthodontic treatment of periodontal defects. Part II: a systematic review on human and animal studies. Prog Orthod 2011;12:45-52.
317. Rotundo R, Nieri M, Iachetti G, Mervelt J, Cairo F, Baccetti T, et al. Orthodontic treatment of periodontal defects. A systematic review. Prog Orthod 2010;11:41-4.
318. Ruf S, Klimas D, Hönemann M, Jabir S. Genetic background of nonsyndromic oligodontia: a systematic review and meta-analysis. J Orofac Orthop/Fortschritte der Kieferorthopädie 2013;74:295-308.
319. Saltaji H, Cummings GG, Armijo-Olivo S, Major MP, Amin M, Major PW, et al. A descriptive analysis of oral health systematic reviews published 1991-2012: cross sectional study. PLoS One 2013;8:e74545.
320. Sandhu SS, Cheema MS, Khehra HS. Comparative effectiveness of pharmacologic and nonpharmacologic interventions for orthodontic pain relief at peak pain intensity: a Bayesian network meta-analysis. Am J Orthod Dentofacial Orthop 2016;150:13-32.
321. Sandoval P, Bizcar B. Beneficios de la implementacion de ortodoncia interceptiva en la clinica infantil. Int J Odontostomatol 2013;7:253-65.
322. Santos IJ, de Castro A, Andreo J, Torres K, Jamaluddin F, Vieira D, et al. Ozone therapy in dentistry: a systematic review. Int J Odontostomatol 2013;7:267-78.
323. Schatzle M, Mannchen R, Zwahlen M, Lang NP. Survival and failure rates of orthodontic temporary anchorage devices: a systematic review. Clin Oral Implants Res 2009;20:1351-9.
324. Segal GR, Schiffman PH, Tuncay OC. Metaanalysis of the treatment-related factors of external apical root resorption. Orthod Craniofac Res 2004;7:71-8.
325. Serra-Torres S, Bellot-Arcis C, Montiel-Company JM, Marco-Algarra J, Almerich-Silla JM. Effectiveness of mandibular

advancement appliances in treating obstructive sleep apnea syndrome: a systematic review. Laryngoscope 2016;126:507-14.
326. Sharples LD, Clutterbuck-James AL, Glover MJ, Bennett MS, Chadwick R, Pittman MA, et al. Meta-analysis of randomised controlled trials of oral mandibular advancement devices and continuous positive airway pressure for obstructive sleep apnoea-hypopnoea. Sleep Med Rev 2016;27:108-24.
327. Shi Q, Yang S, Jia F, Xu J. Does low level laser therapy relieve the pain caused by the placement of the orthodontic separators?—A meta-analysis. Head Face Med 2015;11:28.
328. Silveira GS, de Almeida NV, Pereira DMT, Mattos CT, Mucha JN. Prosthetic replacement vs space closure for maxillary lateral incisor agenesis: a systematic review. Am J Orthod Dentofacial Orthop 2016;150:228-37.
329. Skeggs RM, Benson PE, Dyer F. Reinforcement of anchorage during orthodontic brace treatment with implants or other surgical methods. Cochrane database Syst Rev 2007;CD005098.
330. Solano-Hernandez B, Antonarakis GS, Scolozzi P, Kiliaridis S. Combined orthodontic and orthognathic surgical treatment for the correction of skeletal anterior open-bite malocclusion: a systematic review on vertical stability. J Oral Maxillofac Surg 2013;71:98-109.
331. Sonesson M, Bergstrand F, Gizani S, Twetman S. Management of post-orthodontic white spot lesions: an updated systematic review. Eur J Orthod 2017;39:116-21.
332. Song F, O'Meara S, Wilson P, Golder S, Kleijnen J. The effectiveness and cost-effectiveness of prophylactic removal of wisdom teeth. Health Technol Assess 2000;4:1-55.
333. Sunnak R, Johal A, Fleming PS. Is orthodontics prior to 11 years of age evidence-based? A systematic review and meta-analysis. J Dent 2015;43:477-86.
334. Tang X, Sensat ML, Stoltenberg JL. The antimicrobial effect of chlorhexidine varnish on mutans streptococci in patients with fixed orthodontic appliances: a systematic review of clinical efficacy. Int J Dent Hyg 2016;14:53-61.
335. Tannure PN, Oliveira CAGR, Maia LC, Vieira AR, Granjeiro JM, Costa M de C. Prevalence of dental anomalies in nonsyndromic individuals with cleft lip and palate: a systematic review and meta-analysis. Cleft Palate Craniofac J 2012;49:194-200.
336. Thilander B. Orthodontic space closure versus implant placement in subjects with missing teeth. J Oral Rehabil 2008;35(Suppl 1):64-71.
337. Thilander B, Bjerklin K. Posterior crossbite and temporomandibular disorders (TMDs): need for orthodontic treatment? Eur J Orthod 2012;34:667-73.
338. Thiruvenkatachari B, Harrison JE, Worthington HV, O'Brien KD. Orthodontic treatment for prominent upper front teeth (class II malocclusion) in children. Cochrane Database Syst Rev 2013;CD003542.
339. Thiruvenkatachari B, Harrison J, Worthington H, O'Brien K. Early orthodontic treatment for Class II malocclusion reduces the chance of incisal trauma: Results of a Cochrane systematic review. Am J Orthod Dentofacial Orthop 2015;148:47-59.
340. Tieu LD, Saltaji H, Normando D, Flores-Mir C. Radiologically determined orthodontically induced external apical root resorption in incisors after non-surgical orthodontic treatment of class II division 1 malocclusion: a systematic review. Prog Orthod 2014;15:48.
341. Toffol L, Pavoni C, Baccetti T, Franchi L, Cozza P. Orthopedic treatment outcomes in class III malocclusion. A systematic review. Angle Orthod 2008;78:561-73.
342. Trpevska V, Kovacevska G, Benedeti A, Jordanov B. T-scan III system diagnostic tool for digital occlusal analysis in orthodontics—a modern approach. Pril (Makedonska Akad na Nauk i Umet Oddelenie za Med Nauk 2014;35:155-60.
343. Tsanidis N, Antonarakis GS, Kiliaridis S. Functional changes after early treatment of unilateral posterior cross-bite associated with mandibular shift: a systematic review. J Oral Rehabil 2016;43:59-68.
344. Tsichlaki A, Chin SY, Pandis N, Fleming PS. How long does treatment with fixed orthodontic appliances last? A systematic review. Am J Orthod Dentofacial Orthop 2016;149:308-18.
345. Tsichlaki A, O'Brien K. Do orthodontic research outcomes reflect patient values? A systematic review of randomized controlled trials involving children. Am J Orthod Dentofacial Orthop 2014;146:279-85.
346. Tsui WK, Chua HDP, Cheung LK. Bone anchor systems for orthodontic application: a systematic review. Int J Oral Maxillofac Surg 2012;41:1427-38.
347. Tulloch JF, Medland W, Tuncay OC. Methods used to evaluate growth modification in Class II malocclusion. Am J Orthod Dentofacial Orthop 1990;98:340-7.
348. Tunison W, Flores-Mir C, ElBadrawy H, Nassar U, El-Bialy T. Dental arch space changes following premature loss of primary first molars: a systematic review. Pediatr Dent 2008;30:297-302.
349. Uzel A, Alparslan ZN. Long-term effects of presurgical infant orthopedics in patients with cleft lip and palate: a systematic review. Cleft Palate Craniofac J 2011;48:587-95.
350. van Vlijmen OJC, Kuijpers MAR, Berge SJ, Schols JGJH, Maal TJJ, Breuning H, et al. Evidence supporting the use of cone-beam computed tomography in orthodontics. J Am Dent Assoc 2012;143:241-52.
351. Verstraaten J, Kuijpers-Jagtman AM, Mommaerts MY, Berge SJ, Nada RM, Schols JGJH. A systematic review of the effects of bone-borne surgical assisted rapid maxillary expansion. J Craniomaxillofac Surg 2010;38:166-74.
352. Viglianisi A. Effects of lingual arch used as space maintainer on mandibular arch dimension: a systematic review. Am J Orthod Dentofacial Orthop 2010;138:382.e1-4.
353. von Bohl M, Kuijpers-Jagtman AM. Hyalinization during orthodontic tooth movement: a systematic review on tissue reactions. Eur J Orthod 2009;31:30-6.
354. von Bohl M, Ren Y, Fudalej PS, Kuijpers-Jagtman AM. Pulpal reactions to orthodontic force application in humans: a systematic review. Endod 2012;38:1463-9.
355. von Bremen J, Ruf S. Orthodontic and dentofacial orthopedic management of juvenile idiopathic arthritis: a systematic review of the literature. Orthod Craniofac Res 2011;14:107-15.
356. Walker S, Tieu L, Flores-Mir C. Radiographic comparison of the extent of orthodontically induced external apical root resorption in vital and root-filled teeth: a systematic review. Eur J Orthod 2013;35:796-802.
357. Wanderley E, Rodrigues Cardoso A, Camelo M, Ribeiro M, Gomes Moreira V, Rodriguez F, et al. Orthodontics as a Treatment of Temporomandibular Disorders: Determination of the Scientific Evidence Level. Rev Bras Ciências da Saúde 2013;17:97-104.
358. Wanderley RB, Cardoso AMR, Moreira M, Paulino MR, Moreira VG, Nunes FMR, et al. Ortodontia como tratamento da disfunção temporomandibular: determinação do nível de evidência científica da literatura. Rev Bras Ciências da Saúde 2013;17:97-104.
359. Wasserman I, Barberá A, Conte F, Zajia E. Férula de retención o placa Essix® como alternativa en ortodoncia: revisión sistemática. Rev Salud Bosque 2015;4:37-50.
360. Wasserman I, Morales Á, Navas Y, Rodríguez S. ¿ La fibrotomía contribuye a la estabilidad del tratamiento de ortodoncia? Revisión sistemática. Rev Salud Bosque 2014;4:51-62.

361. Watkinson S, Harrison JE, Furness S, Worthington HV. Orthodontic treatment for prominent lower front teeth (Class III malocclusion) in children. Cochrane Database Syst Rev 2013.
362. Weltman B, Vig KWL, Fields HW, Shanker S, Kaizar EE. Root resorption associated with orthodontic tooth movement: a systematic review. Am J Orthod Dentofacial Orthop 2010;137:462-76: discussion 12A.
363. Wen YF, Wong HM, Lin R, Yin G, McGrath C. Inter-ethnic/racial facial variations: a systematic review and Bayesian meta-analysis of photogrammetric studies. PLoS One 2015;10:e0134525.
364. Wen YF, Wong HM, McGrath CP. Longitudinal photogrammetric analysis of soft tissue facial changes: a systematic review of the literature and a summary of recommendations. J Craniofac Surg 2015;26:1830-4.
365. Winsauer H, Vlachojannis C, Bumann A, Vlachojannis J, Chrubasik S. Paramedian vertical palatal bone height for mini-implant insertion: a systematic review. Eur J Orthod 2014;36:541-9.
366. Woon SC, Thiruvenkatachari B. Early orthodontic treatment for Class III malocclusion: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2017;151:28-52.
367. Wu F-L, Wang L-Y, Huang Y-Q, Guo W-B, Liu C-D, Li S-G. Interleukin-1beta +3954 polymorphisms and risk of external apical root resorption in orthodontic treatment: a meta-analysis. Genet Mol Res 2013;12:4678-86.
368. Xiang M, Hu B, Liu Y, Sun J, Song J. Changes in airway dimensions following functional appliances in growing patients with skeletal class II malocclusion: a systematic review and meta-analysis. Int J Pediatr Otorhinolaryngol 2017;97:170-80.
369. Xiaoting L, Yin T, Yangxi C. Interventions for pain during fixed orthodontic appliance therapy. A systematic review. Angle Orthod 2010;80:925-32.
370. Yang X, Su N, Shi Z, Xiang Z, He Y, Han X, et al. Effects of self-ligating brackets on oral hygiene and discomfort: a systematic review and meta-analysis of randomized controlled clinical trials. Int J Dent Hyg 2017;15:16-22.
371. Yang X, He Y, Chen T, Zhao M, Yan Y, Wang H, et al. Differences between active and passive self-ligating brackets for orthodontic treatment. J Orofac Orthop/Fortschritte der Kieferorthopädie 2017;78:121-8.
372. Yang X, Li C, Bai D, Su N, Chen T, Xu Y, et al. Treatment effectiveness of Fränkel function regulator on the class III malocclusion: a systematic review and meta-analysis. Am J Orthod Dentofacial Orthop 2014;146:143-54.
373. Yao J, Li D-D, Yang Y-Q, McGrath CPJ, Mattheos N. What are patients' expectations of orthodontic treatment: a systematic review. BMC Oral Health 2016;16:19.
374. Yengopal V, Mickenautsch S. Caries-preventive effect of resin-modified glass-ionomer cement (RM-GIC) versus composite resin: a quantitative systematic review. Eur Arch Paediatr Dent 2011;12:5-14.
375. Yepes E, Quintero P, Rueda ZV, Pedroza A. Optimal force for maxillary protraction facemask therapy in the early treatment of class III malocclusion. Eur J Orthod 2014;36:586-94.
376. Yu Y, Sun J, Lai W, Wu T, Koshy S, Shi Z. Interventions for managing relapse of the lower front teeth after orthodontic treatment. Cochrane Database Syst Rev 2013.
377. Zahrowski J, Jeske A. Apical root resorption is associated with comprehensive orthodontic treatment but not clearly dependent on prior tooth characteristics or orthodontic techniques. J Am Dent Assoc 2011;142:66-8.
378. Zawawi KH, Melis M. The role of mandibular third molars on lower anterior teeth crowding and relapse after orthodontic treatment: a systematic review. Scientific World J 2014;2014:615429.
379. Zenobio EG, Moreira RC, Soares RV, Feres M, Chambrone L, Shibli JA. A mixed-model study assessing orthodontic tooth extrusion for the reestablishment of biologic width. A systematic review and exploratory randomized trial. Int J Periodontics Restorative Dent 2015;35:19-27.
380. Zhang W, Qu HC, Zhang Y. PAX-9 polymorphism may be a risk factor for hypodontia: a meta-analysis. Genet Mol Res 2014;13:9997-10006.
381. Zhang W, Qu HC, Zhang Y. Association of MSX1 and TGF-beta1 genetic polymorphisms with hypodontia: meta-analysis. Genet Mol Res 2014;13:10007-16.
382. Zhou Y, Long H, Ye N, Xue J, Yang X, Liao L, et al. The effectiveness of non-surgical maxillary expansion: a meta-analysis. Eur J Orthod 2013;36:233-42.
383. Zhou Y, Wang Y, Wang X, Volière G, Hu R. The impact of orthodontic treatment on the quality of life a systematic review. BMC Oral Health 2014;14:66.
384. Zhu Y, Long H, Jian F, Lin J, Zhu J, Gao M, et al. The effectiveness of oral appliances for obstructive sleep apnea syndrome: a meta-analysis. Dent 2015;43:1394-402.
385. Zhu Y, Li J, Tang Y, Wang X, Xue X, Sun H, et al. Dental arch dimensional changes after adenoidectomy or tonsillectomy in children with airway obstruction: a meta-analysis and systematic review under PRISMA guidelines. Medicine (Baltimore) 2016;95:e4976.
386. Zhylich D, Suri S. Mandibular incisor extraction: a systematic review of an uncommon extraction choice in orthodontic treatment. Orthod 2011;38:185-95: quiz 231.
387. Zuccati G, Casci S, Doldo T, Clauser C. Expansion of maxillary arches with crossbite: a systematic review of RCTs in the last 12 years. Eur J Orthod 2013;35:29-37.
388. Zurfluh MA, Kloukos D, Patcas R, Eliades T. Effect of chin-cup treatment on the temporomandibular joint: a systematic review. Eur J Orthod 2015;37:314-24.
389. Zymperdikas VF, Koretsi V, Papageorgiou SN, Papadopoulos MA. Treatment effects of fixed functional appliances in patients with Class II malocclusion: a systematic review and meta-analysis. Eur J Orthod 2016;38:113-26.