

# Reporting Quality of Abstracts in Systematic Reviews in Orthodontics: An Observational Study

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## ABSTRACT

**Aim:** This study aimed to evaluate the reporting quality of systematic review (SR) abstracts in leading orthodontic journals using the PRISMA abstract criteria. Additionally, the study examined characteristics associated with improved abstract reporting quality.

**Materials and methods:** A retrospective observational study design was employed. Systematic reviews published between January 2018 and December 2022 in four prominent orthodontic journals were identified through electronic and manual searches. Inclusion criteria focused on articles with "SR" or "meta-analysis" keywords in the title or abstract. Narrative and historical reviews, scoping reviews, and case reports with extensive literature reviews were not considered as part of the exclusion criteria. The screening was carried out in duplicate and independently by the two authors.

**Results:** The European Journal of Orthodontics had the highest number of included articles, while the Journal of Orthodontics had the lowest. The majority of SRs had authors affiliated with academic institutions. Compliance scores varied across journals and regions, with Asia scoring the highest. Certain checklist items, such as identifying the report as an SR, stating objectives, describing included studies, providing interpretation, and registration, were adequately reported in over 93% of the reviews. However, the reporting of risk of bias and synthesis of results showed room for improvement.

**Conclusion:** The study revealed a significant improvement in the overall Preferred Reporting Items for SRs and Meta-Analyses for Abstracts (PRISMA-A) score of included SRs, primarily due to enhanced reporting of specific checklist items. However, there remains considerable scope for further improvement in abstract reporting, highlighting the importance of striving to meet higher standards in SR abstracts.

**Clinical significance:** The study showed a notable increase in the PRISMA-A score. However, there is still a need for continued efforts to meet higher reporting standards in SR abstracts.

**Keywords:** Abstract quality, Orthodontics, The Preferred Reporting Items for Systematic Reviews and Meta-analyses for Abstracts, Reporting quality, Systematic reviews.

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## INTRODUCTION

For the majority of readers of biomedical research, the abstract is the first and frequently only step in determining if an article is relevant to them. Due to paywalls, limited time, or the manuscript's native language, the abstract may be the only source to which a reader has access in certain circumstances.<sup>1</sup> Furthermore, it is important to highlight that a significant number of studies are initially presented as summaries or abstracts at professional meetings. However, less than half of these conference-presented studies are ultimately published as peer-reviewed journal articles, indicating a notable disparity between the presentation of research findings and their subsequent availability in the scientific literature.<sup>2</sup> Similarly, during submissions, journal editors mainly read the abstract to decide whether to reject the paper immediately or to continue with the peer-reviewing process.<sup>3</sup> As a result, the utilization of a well-structured and clearly written abstract is crucial for effectively and transparently disseminating scientific research findings across all study designs. However, this is particularly essential for systematic reviews (SRs) due to their vital function in synthesizing evidence from which conclusions and informed decisions in clinical practice can be derived.<sup>4</sup> The Preferred Reporting Items for SRs and Meta-Analyses for Abstracts (PRISMA-A) were developed and subsequently endorsed by the scientific community with the aim of aiding writers in delivering transparent and comprehensive reporting of their SR abstracts. In 1996, the Quality of Reporting of Meta-analyses

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(QUOROM) statement was created, then renamed PRISMA-A in 2009, and updated in 2015 and 2020.<sup>5</sup> Several journals and editorial groups have endorsed the guidelines and adopted them.

A small body of research has investigated the reporting quality of SR abstracts in the field of orthodontics, and these studies primarily encompassed publications before 2018.<sup>6–8</sup> With the growing volume of SRs and meta-analyses published in the field of orthodontics in recent years, there has been a modest enhancement in the quality of reporting in SR abstracts. The authors highlighted that compliance with PRISMA guidelines for SRs in orthodontics was insufficient in both abstracts and full texts, particularly in non-Cochrane studies, in various domains.

The main aim of this study was to assess the reporting quality of SR abstracts in prominent orthodontic journals, specifically in relation to the criteria outlined in the PRISMA abstract guidelines. A secondary purpose was to investigate characteristics related to improved abstract reporting quality.

## MATERIALS AND METHODS

The study design was a retrospective observational study. From January 2018 to December 2022, a combination of electronic and hand search was conducted to identify SRs, with or without meta-analysis, regardless of their research question, in the following four leading orthodontic journals: American Journal of Orthodontics and Dentofacial Orthopedics (AJODO), Angle Orthodontist, European Journal of Orthodontics (EJO), and Journal of Orthodontics (JO). Articles were initially identified for inclusion if their titles or abstracts contained the keywords "SR" or "meta-analysis." Subsequently, full texts were retrieved for any article containing one or more of these keywords for further confirmation that it indeed reported a SR. Exclusion criteria encompassed literature reviews with non-systematic approaches, including narrative, historical, and scoping reviews, as well as case reports featuring extensive reviews. The screening was carried out in duplicate and independently by the two authors. Disagreements between the authors were resolved through discussion until a census was reached.

The reporting quality of abstracts from the SRs included in the study was assessed by one author (RA) using the PRISMA-A guidelines for abstract reporting. To strengthen the assessment protocol, the assessing author (RA) was calibrated using a pilot study and direct reference to PRISMA-A guidelines and associated explanation.<sup>9</sup> This calibration process involved utilizing three SRs that were not included in the final sample. The guidelines are comprised of 12 items, including title, background, eligibility criteria, information sources, risk of bias, methods of synthesis of results, included studies, results of the synthesis of results, limitation of evidence, interpretation, funding, and registration. Each item was scored as "Yes" if it was reported, "No" if it was not reported, or "NA" if it was not applicable. In cases where certain items, such as result synthesis in non-meta-analyses, were not applicable, they were labeled as "NA". An overall PRISMA-A compliance score was computed for each review and then converted into a percentage.

Furthermore, the subsequent details were obtained for each identified abstract of a SR: the journal in which it was published, the publication year, the number of authors, the continent and country of the first author, the first author's affiliation, and whether a statistician was involved.

Another author (FA) scored a 10% random sample to evaluate the inter-rater reliability between the authors. In addition, another 10% of the random sample was reassessed by same author (RA) for reporting quality after a 3-month washout period in order to assess intra-examiner reliability.

The descriptive data and percentage of compliance with PRISMA checklist items for published SRs were evaluated. To explore the relationships between the overall mean compliance score and potential influencing factors, a linear regression analysis was conducted. Additionally, inter-correlation coefficient (ICC) tests were used to assess both inter- and intraexaminer reliability. The SPSS 22.00 was used to conduct statistical analysis (IBM SPSS Statistics for Macintosh, Version 22.0. IBM Corp, Armonk, NY, USA).

## RESULTS

Inter-rater and intrarater reliability for abstract reporting assessment were high, as demonstrated by ICCs of 0.81 and 0.88, indicating strong agreement among and within raters.

Among the reports published in the four selected journals between 2018 and 2022 (2114), only 5.2% (111) of the published papers were identified as SRs. The EJO had the highest number of articles included in this study, accounting for 49% of the total (54 out of 111), while the JO contributed only 8% with nine SRs. Europe had the highest representation of first authors, with 42% of the papers, followed by Asia with 26%. Furthermore, 96% of the included reports had a first author affiliated with an academic institution. Additionally, a majority of the SRs (66 out of 111) had 4–6 authors, making up more than half of the total. The characteristics of the included SRs are summarized in Table 1.

The compliance score for all 111 SRs evaluated in this study was 71.6% (95% CI: 69.5–73.6). The EJO had the highest compliance score with a mean of 73.8% (95% CI: 71.1–76.4), followed by JO with a mean of 73.1% (95% CI: 66.1–80.1). The American Journal of Orthodontics and Dentofacial Orthopedics (AJODO) had a mean score of 68.3% (95% CI: 61.3–75.3), and the Angle Orthodontist (AO) had a mean score of 69.7% (95% CI: 65.9–73.5), both lower than EJO. Univariate analysis presented in Table 2 did not reveal statistically significant differences between the journals.

**Table 1:** Characteristics of the 111 SRs

Characteristics	Number of publications	Percentage	Mean score	SD	95% CI
<b>Journals</b>					
AJODO	20	18%	68.34	14.9	61.3–75.3
JO	9	8%	73.1	9.1	66.1–80.1
EJO	54	49%	73.8	9.6	71.1–76.4
AO	27	24%	69.7	9.5	65.9–73.5
<b>Years</b>					
2018	23	21%	72.4	12.4	67.1–77.8
2019	18	16%	69.4	10.6	64.1–74.4
2020	25	23%	72.3	11.9	67.4–77.3
2021	26	23%	72.1	9.6	68.2–76.0
2022	19	17%	71	9.7	66.3–75.7
<b>Authors</b>					
<4	29	26%	75	10.2	71.1–78.9
4–6	66	59%	69.6	11.3	66.7–72.3
>6	16	14%	73.9	7.9	69.7–78.2
<b>Work in academia</b>					
No	4	4%	66.7	11.7	47.9–85.4
Yes	107	96%	71.8	10.9	69.7–73.9
<b>Continent</b>					
Asia	29	26%	76.7	9.2	73.1–80.2
Africa	2	2%	50.0		
North America	9	8%	73.1	12.3	63.6–82.6
South America	21	19%	68.6	9.1	64.5–72.7
Europe	47	42%	70.9	10.7	67.7–74.1
Australia	3	3%	63.8	9.6	39.9–87.8
Overall	111	100%	71.6	10.8	69.5–73.6

SD, standard deviation

The mean compliance score varied across regions, with SRs from Asia scoring the highest at 76.7% (95% CI: 73.1–80.2). Europe and South America had scores of 70.9% (95% CI: 67.7–74.1) and 68.6% (95% CI: 64.5–72.7), respectively. The compliance score for Europe was significantly lower than that of Asia, but not significantly different from reports originating from North and South America.

Univariate analysis revealed that the quality of reporting in abstracts of SRs appears to be influenced by the continent of origin. Specifically, abstracts originating from Asia tended to have higher scores compared with those from Europe. Similarly, abstracts authored by three or fewer authors showed better quality than those authored by 4–6 authors. However, factors such as journal, year of publication, and affiliation were not found to be statistically significant in relation to the quality of reporting.

**Table 2:** Univariate linear regression derived coefficients (B) and 95% confidence interval with mean score of compliance with CONSORT as dependent variable for 111 SRs

Predictor variables		Univariate analysis	
Variable	Category	B	95% CI
Journals	EJO	Baseline (reference)	
	AJODO	-0.194	-10.9 to 0.15
	JO	-0.016	-8.3 to 7.1
	AO	-0.16	-9.03 to 0.9
Continents	Europe	Baseline (reference)	
	Asia	0.236	1.03–10.5*
	Africa	-0.258	-35.5 to -6.3*
	North America	0.056	-5.1 to 9.5
	South America	-0.082	-7.6 to 3.02
Years	Australia	-0.106	-19.1 to 4.9
	2018	Baseline (reference)	
	2019	-0.103	-9.8 to 3.8
	2020	-0.004	-6.4 to 6.2
	2021	-0.013	-6.5 to 5.9
Number of authors	2022	-0.049	-8.1 to 5.4
	4–6 authors	Baseline (reference)	
	Fewer than 4	0.22	0.73–10.14*
	More than 6	0.14	-1.5 to 10.3

\*p-value < 0.05

The reporting of PRISMA checklist items ranged from 43 to 100% across the included papers. Items such as identifying the report as a SR (item 1), stating objectives (item 2), describing included studies (item 7), providing interpretation (item 10), and registration (item 12) were adequately reported in over 93% of the included SRs. However, the reporting of risk of bias (item 5) and synthesis of results (item 8) was adequate in 78 and 62% of the papers, respectively. The remaining checklist items were reported inadequately in more than half of the included papers. The detailed percentages of PRISMA-A checklist item reporting can be found in [Table 3](#).

## DISCUSSION

Abstracts of SRs provide concise summaries of knowledge generated through comprehensive review and analysis of studies investigating specific research question. As such, they offer valuable information for clinical decision-making processes. Ensuring the adequacy of reporting in SRs is crucial to maintain high standards in scientific publishing.<sup>10</sup> This study aimed to assess the adequacy of reporting in abstracts of SRs in the field of orthodontics, focusing on four highly influential journals known for their rigorous review processes.

The findings of this study revealed that the proportion of published SRs was below 6% of the total articles published in these journals. This number was even lower than the number of published randomized controlled trials (RCTs).<sup>11</sup> Among the selected journals, the EJO stood out as the primary publisher of SRs, accounting for almost half of the total publications from 2018 to 2022. This could be attributed to the frequency of journal issues and the preference of both editors and authors to use this journal as a platform for disseminating SR findings. Notably, this journal demonstrated a strong performance in reporting most items of the PRISMA checklist, suggesting a positive impact of their focus on publishing SRs on reporting standards. It is important to mention that all four journals endorse the use of PRISMA guidelines for reporting SRs in their manuscript submissions. However, the differences in reporting adequacy among the journals were not statistically significant, as revealed by the univariate analysis.

A total of 111 SRs were analyzed in this study, and they were published in selected four journals. The reviews were evaluated against the 2020 PRISMA checklist, which sets standards for reporting abstracts of SRs. The PRISMA-A guidelines were initially published in 2013 and underwent subsequent updates, leading to an improvement in reporting standards across various fields of

**Table 3:** Calculated score value of PRISMA abstracts checklist

Item	All journals (%)	AJODO	JO	EJO	AO
1. Identify the report as a systematic review	100%	100%	100%	100%	100%
2. Objectives	100%	100%	100%	100%	100%
3. Eligibility criteria (inclusion and exclusion criteria)	49%	65%	44%	44%	46%
4. Information sources (databases/registers)	43%	55%	44%	35%	50%
5. Risk of bias	78%	70%	56%	94%	61%
6. Methods of synthesis results	52%	40%	56%	52%	61%
7. Included studies	94%	80%	100%	96%	96%
8. Synthesis of results	62%	50%	100%	70%	43%
9. Limitation of evidence	30%	35%	22%	22%	43%
10. Interpretation	93%	75%	100%	100%	89%
11. Funding	63%	55%	56%	70%	57%
12. Registration	95%	95%	100%	100%	86%

dentistry, including operative dentistry, general dentistry, implant dentistry, dental medicine, and periodontology.<sup>12–16</sup> Previous studies, similar to the present study, have demonstrated improvements in reporting specific checklist items, such as the inclusion of the “title” and “objectives” in abstracts of SRs. However, the previous studies and the current study found that other vital items, such as “limitations” and “information sources,” were either not reported or inadequately reported.<sup>8,17</sup> The publication of the PRISMA-A checklist and its subsequent updates likely played a role in driving these improvements, as evidenced by a comparison of reporting quality before and after the checklist’s release. It is important to note that many peer-reviewed journals support adherence to these guidelines through their “instructions to the authors” section. Vasquez-Cardena et al. conducted an extensive search and examined all published SRs prior to 2018.<sup>8</sup> Their findings revealed a notable improvement in the quality of reporting abstracts of SRs in orthodontics following the publication of the PRISMA-A guidelines. Although the quality was not perfect, the authors emphasized the significant progress. Prior to the publication of PRISMA-A, the compliance score was 48.3%, which increased to 59.1%. In the current study, which focused on publications from 2018 to 2022 and utilized the updated version of the guidelines, a similar trend of improvement in reporting abstracts of SRs was observed.<sup>6,8</sup> The differences between the two studies may be attributed to the use of different checklist versions and the inclusion of SRs from orthodontic journals with high impact factors within a specific 4-year period. However, it remains imperative to consistently strive for improvement in adhering to reporting guidelines and closely monitor the submission of manuscripts as integral steps within the peer-review process.<sup>18,19</sup> Reviewers and editors play a crucial role in this process during the paper submission and peer-review stage. Reviewers have the important task of thoroughly evaluating the manuscript to assess its compliance with reporting guidelines and the overall quality of the SR.

The subjective nature of scoring the checklist items presents an inherent limitation in our study. However, we made efforts to minimize subjectivity by directly referencing the PRISMA-A checklist when assessing the included SRs. It is important to acknowledge that the inclusion of reports from journals with high impact factors may introduce bias, limiting the generalizability of our findings to the broader population of published SRs. Nevertheless, our study provides valuable insights into the quality of reporting in abstracts of systematically reviewed articles that have undergone rigorous peer review. By selecting journals with high impact factors, we aimed to capture the highest standards of publication in the field. Recognizing the significance of transparent scientific publishing, regular evaluations of researchers’ reporting practices are crucial to ensure the accurate reporting of research findings.

## CONCLUSION

The study demonstrated a significant improvement in the overall PRISMA-A score of the included SRs, primarily attributed to the enhanced reporting of two specific checklist items. This indicates that there is still considerable room for further improvement, emphasizing the importance of making efforts to meet higher standards in reporting abstracts of SRs.

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