

# Bibliometric Analysis of Systematic Reviews, Meta-analysis, Randomized Controlled Trials in South Asian Orthodontic Journals from 2015 to 2022

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## ABSTRACT

**Objective:** This study was conducted to explore authorship characteristics and publication trends of all orthodontic randomized controlled trials (RCTs), systematic reviews (SRs), and meta-analyses (MAs) published in South Asian Orthodontic Journals (SAOJ) from 2015 to 2022.

**Materials and methods:** Appropriate search strategies were developed to search for all articles published from January 2015 to July 2022. Asian Pacific Orthodontic Society (APOS) Trends in Orthodontics, Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJODO), The Journal of Indian Orthodontic Society (JIOS), Orthodontic Journal of Nepal (OJN), and Pakistan Orthodontic Journal (POJ) are the only five orthodontic journals that meet these requirements. The initial search yielded 39 results, but after the inclusion criteria were applied, the final number of articles was reduced to 31. For each article, various authorship characteristics were recorded. All parameters' frequency distributions were investigated and tabulated.

**Results:** More than half of the included publications (51.7%) were SRs, followed by RCTs (45.1%), and Mas (3.2%) published in SAOJ. JIOS appeared to outnumber other journals with the most publications, followed by APOS trends in Orthodontics, OJN, and BJODO. Almost 80.4% of articles were acknowledged by educational institutes. Authorship status of the publications authored by two researchers in JIOS and OJN, three in APOS Trends in Orthodontics, and four or more in JIOS.

**Conclusion:** From 2015 to 2021, the amount of level-1 evidence orthodontic literature published in SAOJ increased dramatically. This implies that journals are becoming more interested in evidence-based orthodontic studies, as well as a trend for orthodontic authors to conduct and publish their work.

**Clinical significance:** Academicians, clinicians, and researchers all face challenges in keeping up with the literature as a large number of studies are published in dentistry. RCTs, MAs, and RCTs aid in the summarization of the outcomes of various intervention trials and are thus valuable methods for evidence-based research.

**Keywords:** Hierarchy of evidence, Publication trends, Research, Study design.

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## INTRODUCTION

In this day of rapid technological growth, it is more crucial than ever for clinicians to stay abreast of new advancements. Journals are important because they provide a means of communication and documentation for scientific research that may be used to make therapeutic strategies and generate new research subjects. Bibliometric analyses are a set of quantitative tools for evaluating academic publications. This type of analysis aids us in keeping track of the journals' progress.<sup>1</sup>

The level of evidence provided by publications has become increasingly important in the era of evidence-based medicine, and this is primarily dependent on the research design used in a study. As a result, evaluating such attributes of research publications is a helpful introspective and essential quality control approach.<sup>2</sup>

The goal of scientific journals is to introduce, publish, and distribute new knowledge resulting from innovative thinking and thorough investigation.<sup>3</sup> Journals are frequently graded based on their impact factor, which assesses a journal's impact by analyzing the frequency of citations of its published articles over a period of time.<sup>4</sup> However, SRs, which may or may not include MAs and RCTs, provide the highest possible level of scientific evidence to assess the quality of a published article.<sup>5,6</sup>

Thus, collecting data concerning high-quality published articles would be an indirect method of assessing the quality of

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literature within a scientific field. Bibliometric data from various journals show clear trends toward international collaborations and higher-quality publications. Electronic databases and open-access (OA) publications have clearly improved access to information and cross-specialty communication. In recent years, there has been a significant increase in OA publications in dentistry, with 45.8% of all articles published in a given year being available as open access.<sup>6</sup>

South Asia is attempting to catch up with the rest of the world today in the advancement of orthodontics. With similar trends,

many journals focused on orthodontics are also published in South Asian countries. Although the demographics of articles published in major worldwide orthodontic publications have been studied, South Asian orthodontic periodicals have received less attention.<sup>7,8</sup>

As the speculation over the quality of research and evidence-based clinical practice continues, it becomes increasingly important to evaluate the quality of research published in orthodontic journals, especially since they remain the most influential source of information for orthodontists.<sup>9–11</sup> According to the Cochrane Collaboration's guidelines, MAs, SRs, and RCTs provide the highest level of evidence (level 1—evidence).<sup>12</sup>

The purpose of this study was to look into the demographics of all MAs, SRs, and RCTs published in SAOJ from 2015 to 2022.

## MATERIALS AND METHODS

The publications were selected based on the methodology adopted from Gyawali et al.<sup>9</sup> APOS, BJODO, JIOS, OJN, and POJ are the only five orthodontic journals that meet these requirements. As a result, only articles published between 2015 and 2022 were considered and included in this investigation.

The following parameters were recorded for each article:

- The journal's name.
- The year of publication—the year of publishing was given a numerical value. Articles were also categorized as “published between 2015 and 2022.”
- Type of article (SRs, MAs, and RCTs).
- Number of authors—articles were divided into seven groups based on the number of authors (one author, two authors, three authors, four authors, five authors, six authors, as well as more than six authors).
- Geographic origin—articles were grouped into geographic origins based on the authors' affiliation with the country of the principal investigator
- Type of institutional attachment—academicians, researchers, and private practitioners were the three types of authors of the published article.

## Search Methodology

To identify all SRs, MAs, and RCTs published in SAOJ between 2015 and 2022, precise search strategies were developed and implemented.

The search was based on the methodology created for Medline, but it was modified for each database to take into consideration variations in regulated vocabulary and syntax restrictions (“orthodont\*” and “meta-analysis”) and (“orthodont\*” and “systematic review”) and (“orthodont\*” and “randomised control trial”) and (“orthodont\*” and “randomized control trail”).

No restrictions were applied during the electronic search regarding language or publication status. However, duplicate papers and those without an English abstract were not included. All articles' Portable Document Format (PDF) files were downloaded, archived, and organized on an external hard drive by journal and article type. The articles that were not in PDF format were manually searched, scanned, and then added to the database. The frequency of publication of SAOJ as APOS and JIOS is published on a quarterly basis. OJN and POJ are published biannually, while BJODO is published annually.

All the articles were assessed by two authors independently, and in case of a dispute regarding the type of article, a third opinion was sought, and the decision was finalized.

## RESULTS

All SAOJ—APOS Trends in Orthodontics, BJODO, JIOS, OJN, and POJ—were electronically searched for issues published between 2015 and 2022.

A digital search of the issues published in such journals revealed that BJODO hadn't released any new issues since 2018. Furthermore, OJN released a single issue, and POJ has not yet published any issues from 2021 (Table 1). All of these journals provide open access; therefore, complete texts of every article were downloaded to obtain additional information about the article.

### Frequency Distribution of Articles with Number of Authors in SAOJ

A total of 40 articles were identified, with JIOS publications outnumbering others with 24 articles. The number of authors in an article ranged from one to six, with more articles authored by two researchers in JIOS (five articles) and OJN (four articles), three in APOS Trends in Orthodontics (five articles), and four or more in JIOS (15 articles) (Table 2).

### Frequency Distribution of Country Affiliation by Principal Investigator in SAOJ

The highest level of international collaboration in authorship was found in OJN. However, the majority of authors were from India, where 66.8% of total articles included authors from at least two countries; the lowest level was found in JIOS, where international collaboration was seen in 8.6% of articles and 91.4% of Indian authors.

The majority of the articles in APOS Trends in Orthodontics, JIOS, and OJN were contributed by Indian researchers. Among other journals, the principal authors of most of the articles originated from the country of the publishing journal (Table 3).

### Comparison between Types of Article

The frequency distributions of assorted types of articles were tabulated. SRs were more prevalent than the other two types

**Table 1:** Number of issues published between 2015–2022

Journal	2015	2016	2017	2018	2019	2020	2021	2022
APOS	6	6	6	4	4	4	4	1 + 1 <sup>#</sup>
JIOS	4 + 1*	4 + 1*	4	4 + 2*	4	4	4	3 + 1 <sup>#</sup>
BJODO	1	1	1	–	–	–	–	–
OJN	2	2	2	2	2	2 + 1*	2	1 <sup>#</sup>
PJO	2	2	2	2	2	2	–	–

\*indicates supplementary issues; #indicates online first issues. APOS, APOS trends in Orthodontics; BJODO, Bangladesh Journal of Orthodontics and Dentofacial Orthopedics; JIOS, The Journal of Indian Orthodontic Society; OJN, Orthodontic Journal of Nepal; PJO, Pakistan Journal of Orthodontics

**Table 2:** Total number of articles with number of authors in SAOJ

Number of authors	APOS	JIOS	BJODO	OJN	POJ	Grand total
1	–	–	–	–	–	–
2	2	5	1	4	–	12
3	5	3	–	1	–	9
4	1	5	–	1	–	7
5	–	2	–	–	–	2
6 or >6	2	8	–	–	–	10
Grand total	10	23	1	6	–	40

APOS, APOS trends in Orthodontics; BJODO: Bangladesh Journal of Orthodontics and Dentofacial Orthopedics; JIOS, The Journal of Indian Orthodontic Society; OJN, Orthodontic Journal of Nepal; POJ, Pakistan Journal of Orthodontics

**Table 3:** Country affiliation of principal investigator in SAOJ

Journal	Principal investigator country	Number of articles
APOS	India	8 (80%)
	Dubai	1 (10%)
	Pakistan	1 (10%)
Total		10 (100%)
JIOS	India	21 (91.4%)
	USA	1 (4.3%)
	Brazil	1 (4.3%)
Total		23 (100%)
OJN	India	4 (66.8%)
	Nepal	1 (16.6%)
	West China	1 (16.6%)
Total		06 (100%)
BJODO	Japan	1 (100%)
Total		01 (100%)
POJ	–	0
Total		0%

APOS, APOS trends in Orthodontics; BJODO, Bangladesh Journal of Orthodontics and Dentofacial Orthopedics; JIOS, The Journal of Indian Orthodontic Society; OJN, Orthodontic Journal of Nepal; POJ, Pakistan Journal of Orthodontics

of articles in SAOJ, such as more than half of the included publications (57.5%) were SRs, followed by RCTs (35%) and MAs (7.5%), respectively. In terms of the degree of collaboration for each article, JIOS appeared to outnumber other journals with the most publications, followed by APOS trends in orthodontics, OJN, and BJODO. BJODO has not issued any publications since 2018, and POJ has not published any of these corresponding articles from 2021 (Table 4).

### Comparison of Institutional Attachment of Authors

The majority of the articles were published by authors related to the academic profession, then the private practitioners and researchers in all SAOJ. Almost 85.1% of articles were acknowledged by educational institutes (Table 5).

Among the various orthodontic journals in South Asia, JIOS, and APOS Trends in Orthodontics are the authors' most preferred journals for publishing RCTs, SRs, and MAs, followed by other journals.

## DISCUSSION

The demographic characteristics of all level-1 evidence article in orthodontics published in SAOJ were investigated in this study. It provides valuable bibliometric data that can be used to indirectly assess the quality of orthodontic literature from 2015 to 2022. The research showed certain publication trends in terms of the geographic origin of published articles and article type.

Furthermore, as the academic landscape has become more competitive, educational institution-related authors are increasingly motivated to undertake and publish high-quality research in order to advance their careers. As academic advancement is mostly dependent on receiving public or private research funds,<sup>13</sup> there has been a tendency toward developing high-quality, long-term initiatives. Previous studies have shown that between the late 1980s and 2008, the number of RCTs in the orthodontic literature increased.<sup>14</sup>

As a result, "bibliometrics" is an important scientific instrument for assessing the standard of a journal. Bibliometric analysis is critical in the process of evaluating a scientific journal because it clearly shows the flaws and shows how to improve. The number of issues published in a year denotes a journal's basic research capacity.<sup>15</sup> According to the data obtained from our study, there was an increase in the number of issues (additional supplements) in JIOS beginning in 2012, which increased to four supplements to date.

The study designs published in all SAOJ were predominantly original research work, with 54% of SRs, 43% of RCTs, and 3% of MAs. These are critical for exploring the enormous potential and contributing to the growth of evidence-based orthodontics.<sup>1</sup>

It was noted that the majority of the articles were published by multiple authors from educational institutes, emphasizing the importance of collaboration for the research/survey as well as its coverage. Previous bibliometric studies by Thanuskodi and Thanuskodi results showed that the articles were contributed by single authors (57.01%), while coauthors contributed the remaining 42.98%. According to the study, India accounts for 89.47% of total contributions.<sup>16,17</sup> This also demonstrates that educational institutes encourage more research work as part of the postgraduate curriculum. Hussain et al.,<sup>18</sup> obtained similar results. The current study's findings indicate a lack of interest and participation from private practitioners in our country and other South Asian countries.

The majority of the articles' principal investigators were from the publishing country. JIOS had the lowest percentage of articles with principal foreign investigators, while OJN had the highest. This could be due to nationality prejudices, as mentioned by several authors in the literature.<sup>19,20</sup> A similar trend was observed in major orthodontic journals AJODO and EJO, which had a

**Table 4:** Type of articles published in SAOJ (2015–2022)

Type of study	APOS	JIOS	BJODO	OJN	POJ	Grand total
RCTs	3 (30%)	8 (33.3%)	–	3 (60%)	–	14 (35%)
SRs	6 (60%)	14 (58.4%)	1 (100%)	2 (40%)	–	23 (57.5%)
MAAs	1 (10%)	2 (8.3%)	–	–	–	3 (7.5%)
Grand total	10 (100%)	24 (100%)	1 (100%)	5 (100%)	–	40 (100%)

APOS, APOS trends in Orthodontics; BJODO, Bangladesh Journal of Orthodontics and Dentofacial Orthopedics; JIOS, The Journal of Indian Orthodontic Society; OJN, Orthodontic Journal of Nepal; POJ, Pakistan Journal of Orthodontics

**Table 5:** Type of institutional attachment of authors

Institutional attachment	APOS	JIOS	BJODO	OJN	POJ	Grand total
Educational	33 (82.5%)	83 (84.6%)	2 (100%)	14 (93.3%)	–	132 (85.1%)
Research	2 (5%)	8 (8.2%)	–	–	–	10 (6.5%)
Private	5 (12.5%)	7 (7.2%)	–	1 (6.7%)	–	13 (8.4%)
Grand total	40 (100%)	98 (100%)	2 (100%)	15 (100%)	–	155 (100%)

APOS, APOS trends in Orthodontics; BJODO, Bangladesh Journal of Orthodontics and Dentofacial Orthopedics; JIOS, The Journal of Indian Orthodontic Society; OJN, Orthodontic Journal of Nepal; POJ, Pakistan Journal of Orthodontics

higher proportion of authors from the United States/Canada and the European Union, respectively. Furthermore, the personal influence of authors on editorial board members may be high in the native country, resulting in easy publication in native journals.<sup>9</sup>

The number of authors in an article ranged from six or more than six authors. An increase in the number of authors per article is a sign of collaboration between scholars in a given area of study. Having more minds working on a problem would surely lead to better results, but it is questionable whether all of the coauthors actually contributed significantly to the effort.

The previously uncovered practice of “honorary authorship” is likely to be widespread in South Asia.<sup>21</sup>

As a result, the actual quality of evidence from the article may not be commensurate with the quality expected based on its position in the evidence hierarchy.

In the future, we plan to conduct additional research comparing various other parameters such as the source of the article published, publication bias, and changing study trends. Likewise, further categorization of the focus of studies is required to assess in detail the shifting paradigm in the fields of interest for research in orthodontia.

### Study Limitations

The current study did not take into account the subject coverage of the articles, the ranking of the principal investigator, and the citation analysis.

### CONCLUSION

The amount of international collaboration in authorship and principal foreign investigators was discovered to be minimal.

There is a clear need to increase the proportion of original articles, particularly those with study designs higher in the evidence hierarchy. The recent increase in the number of RCTs and SRs published in the SAOJ, especially in JIOS and APOS trends in orthodontics, is a positive step in the right direction.

Today, there are still notable differences between the SAOJ concerning the type and origin of articles.

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