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Original Article

A Bibliometric Assessment of the Turkish Journal of Orthodontics after WoS Indexing

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Main Points

- Since being indexed in 2017, the Turkish Journal of Orthodontics has maintained a steady output of publications (n=244) and an increasing number of citations, yielding an h-index of 15 and 5.77 citations per article.
- While case reports remained an accepted article type, no case reports were published after the third quarter of 2022, whereas systematic reviews became more frequent from the first quarter of 2023.
- Publications span 39 countries with; Türkiye and India the leading readers and cross regional collaboration hubs have expanded.
- Co-occurrence mapping highlights a growing focus on clear aligners, digital workflows, and artificial intelligence alongside conventional topics.
- Authorship is highly collaborative (94.7% multi-authored) and exhibits near gender parity.

ABSTRACT

Objective: This study analyzed the publication characteristics, citation patterns, and research trends of the Turkish Journal of Orthodontics (TJO) since its Web of Science (WoS) indexing in 2017.

Methods: A retrospective bibliometric analysis was conducted using data from the WoS Core Collection (2018-24) on April, 2025. Network analysis was performed using CiteSpace 6.3.R1 and VOSviewer 1.6.18. Descriptive statistics were used to analyze publication trends, authorship patterns, geographical distribution, and citation performance.

Results: A total of 244 publications were analyzed, comprising 192 (78.7%) original articles, 27 (11.1%) reviews, eight (3.3%) systematic reviews, and 17 (7.0%) case reports. The journal achieved an h-index of 15, with 1408 total citations and an average of 5.77 citations per article. Türkiye contributed the most publications (58.2%), followed by India (16.8%), the USA (6.6%), and Iran (5.3%). International collaboration involved 39 countries, and the most-cited article received 32 citations. The gender distribution of authorship was closely balanced: 52.2% female and 47.8% male. 94.7% of publications were multi-authored, with an average of 3.5 authors per article. Keyword analysis revealed thematic clusters dominated by clear aligners, malocclusion, cone-beam computed tomography, and dental materials.

Conclusion: TJO shows consistent growth in publication volume, expansion of international collaboration, and increases in citation impact since WoS indexing. The journal successfully captures emerging trends in clear aligners and rapid maxillary expansion while maintaining coverage of fundamental orthodontic topics. A strategic editorial evolution toward systematic reviews indicates a commitment to evidence-based practice. This bibliometric overview offers a data-driven foundation for future editorial decision-making and monitoring the journal's evolving role within orthodontic research.

Keywords: Abstracting and indexing, bibliometrics, journal impact factor, orthodontics, periodical

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INTRODUCTION

Scientific journals play a key role in sharing research and advancing science. The Turkish Journal of Orthodontics (TJO), the official publication of the Turkish Orthodontic Society, is a scientific, open-access periodical published quarterly in March, June, September, and December.[1] Since its inception in January 1988, TJO has supported the development of orthodontic science and practice, becoming a respected journal for publishing high-quality and ethically conducted research, clinical studies, and reviews.

A major milestone for the journal was its inclusion in the Web of Science (WoS) in 2017, which greatly increased its international visibility and academic impact. The WoS is a database owned by Clarivate Analytics and is a leading multidisciplinary bibliographic platform that indexes high-quality scientific journals and is widely used to measure research visibility and credibility.[2,3]

Bibliometric analysis is a quantitative method used to evaluate scientific literature and measure a journal's scholarly influence. The analysis provides insights into research growth, development, and collaboration patterns.[4-9] Bibliometric methodologies are generally divided into two complementary analytical dimensions: performance analysis and science mapping. Performance analysis evaluates the productivity and influence of research constituents, such as authors, institutions, and countries, whereas science mapping examines the intellectual and collaborative relationships among these constituents to reveal the structural and thematic evolution of a discipline.[5,6]

Given TJO's evolving position in orthodontic research following WoS indexing, a comprehensive bibliometric analysis can help reveal its academic impact, contributions, and connections within the global research community. Therefore, this study aimed to systematically evaluate TJO's publication characteristics, citation performance, authorship patterns, geographical distribution, institutional collaborations, and thematic evolution since its WoS indexing in 2017 and to provide a comprehensive understanding of the journal's impact on orthodontic research.

METHODS

Study Design and Search Strategy

This retrospective, observational study used bibliometric analysis to evaluate TJO's academic performance after its indexing in the WoS database.

The methodological framework of this study was guided by the dual-dimensional model proposed by Donthu et al.,[5] which categorizes bibliometric analyses into two complementary approaches: performance analysis and science mapping. Performance analysis was used to assess publication productivity, authorship characteristics, institutional and country-level contributions, and citation impact. Science mapping techniques were used to visualize and interpret the intellectual, thematic, and collaborative structures within the TJO research network, including co-authorship, co-citation, and keyword co-occurrence patterns.

All data were retrieved from the Clarivate Analytics WoS Core Collection (WoSCC) (webofscience.com). In the "Documents" section, the journal name "Turkish Journal of Orthodontics" was entered into the "Publication Titles" field, and a comprehensive search was performed in April 2025.

The initial search yielded 547 records. After the duplicate records were removed, the remaining records were subsequently filtered by "Publication Years," limiting the results to 2018-24. The analysis focused on complete annual data through December 2024, excluding 2025 publications to ensure sufficient citation accumulation time, resulting in 257 records. The document type was further restricted to include only case reports, articles, and review articles, resulting in a final dataset of 244 records after excluding one retracted case report from 2019 (Figure 1). Publications were exported in "plain text" format as full records and references from the WoSCC.

Data Collection and Classification

Data were manually retrieved from the journal's official website. Each article was individually reviewed by the same researcher (A.A.) and systematically classified according to multiple parameters: publication year, study type (e.g., original research, case report, etc.), keywords, funding status, number of authors, authors' gender, institutional affiliation and department of all authors, including the first author, and the academic or non-academic nature of affiliations. Author gender was determined based on the given names and, where necessary, publicly available institutional information. Affiliations were categorized by institution type (e.g., university, private practice, etc.) and departmental origin (e.g., orthodontics, prosthodontics, etc.). Following manual data curation, the authors systematically identified the research types and assigned each work to its relevant scientific domain through article-by-article screening conducted directly on the journal's official website.

Bibliometric Analysis Tools

VOSviewer (version 1.6.18, Leiden University, Netherlands) was used to perform collaboration network analysis (e.g., countries, institutions, and authors) and to generate keyword co-occurrence visualizations.[10] The LinLog/modularity method was used in VOSviewer to optimize network layouts.

CiteSpace (v6.3.R1 Advanced, Philadelphia, USA) was used to analyze co-citation and collaboration networks with 1-year time slices (i.e., G-index k=25, top n=50).[11] Tree-ring histories and cluster views were generated, and networks were pruned using sliced-network pruning and minimum spanning tree algorithms.

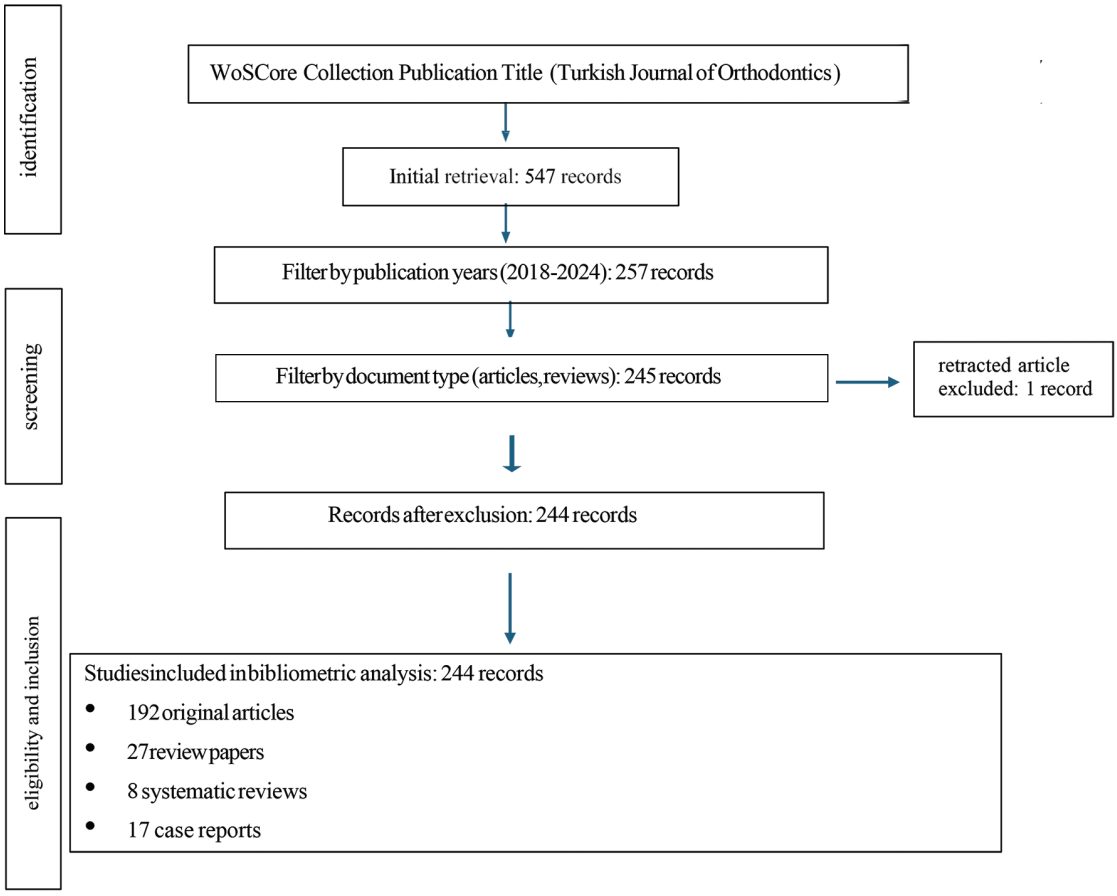

Figure 1. Study selection process following PRISMA guidelines.

Interpretation of Visulizations

The cluster view was used to identify the co-citation, co-authorship, and keyword co-occurrence patterns, facilitating the detection of major research themes and their relationships. Tree-ring history was used to visualize the temporal evolution of nodes such as authors, institutions, countries, or keywords. Betweenness centrality was used to measure how often a node lies on the shortest paths between other nodes, reflecting its role as a connector.

Statistical Analysis

Descriptive statistics were used (e.g., counts and percentages). No hypothesis testing was undertaken because the unit of analysis was the entire WoS-indexed population.

RESULTS

Performance Analysis

Publication trends

A total of 257 documents related to TJO were identified in the WoSCC between 2018 and 2024. Following search refinement to include only articles and review articles (245 records) and exclusion of one retracted case report from 2019, the final dataset comprised 244 publications; consisting of 192 (78.7%) original articles, 27 (11.06%) review papers, eight (3.28%) systematic reviews, and 17 (6.97%) case reports.

From 2018 to 2024, TJO published 244 articles, and one case report was retracted. Annual publication output by year was: 21 (2018); 40 (2019 and 2022); 34 (2020); 33 (2021); 37 (2023); and 36 (2024). Original articles consistently predominated. Case reports were published through the third quarter of 2022, with a peak of seven reports in 2019; none were published thereafter. Systematic reviews were first included in 2023, whereas review articles were published regularly throughout the study period.

Study methodologies

Methodological analysis revealed that 128 (52.5%) publications were clinical studies; of these, 80 (32.8%) were observational and 48 (19.7%) were interventional designs. Laboratory-based studies accounted for 28 (11.5%) of the publications, while a further 88 (36.0%) comprised non-patient-based research, including finite element method analyses, healthcare professional surveys, and bibliometric investigations.

Citation performance and impact

Although the number of publications has remained constant, citation analysis has shown an upward trend. Articles published in 2018 gradually accumulated citations, which peaked in subsequent years. The 2019 cohort, which represented the highest publication volume, showed strong citation growth, particularly from 2022 onwards.

Publications from 2020 to 2022 continued to receive citations, while articles from 2023 and 2024 began to accrue citations shortly after publication. Total citations exceeded 300 by 2024.

Years with higher publication volumes (e.g., 2019 and 2022) did not correspond to proportionally higher citation counts in those years. Instead, the highest citation counts were recorded in 2023-24, reflecting cumulative recognition of articles published in previous years. This finding indicates a temporal lag between publication and peak citation, consistent with patterns of citation maturation in scientific literature.

The analyzed publications received citations from 1309 articles, totaling 1408 citations. Excluding self-citations, 1282 unique citing articles accounted for 1376 citations. The average citation rate was 5.77 per article.

During the study period, TJO achieved an h-index of 15, indicating that 15 papers were cited at least 15 times. Additional metrics included a Clarivate 5-year impact factor of 1.5 and a Scopus CiteScore of 2.0. All records were indexed as "Dentistry Oral Surgery Medicine" in the Emerging Sources Citation Index.

Most frequently cited articles

The top ten most cited articles are presented in Table 1. The most cited publication was "Orthodontic Treatment with Clear Aligners and the Scientific Reality Behind Their Marketing: A Literature Review" by Tamer (2019), with 92 citations (11.5 per year). This was followed by "Assessment of Reliability of YouTube Videos on Orthodontics" by Kilinc (2019), with 62 citations (7.75 per year), and "Fixed Orthodontic Retainers: A Review" by Kaya (2019), with 50 citations (6.25 per year). Other highly cited publications included "Web-based Fully Automated Cephalometric Analysis" by Meric (2020) with 48 citations (6.86 per year) and "The Prevalence of Cleft Lip and Palate Patients: A Single-Center Experience for 17 Years" by Yilmaz (2019) with 42 citations (5.25 per year). Articles focusing on digital orthodontics, online health information, and emerging technologies; such as three-dimensional imaging, digital content reliability, microbial colonization, and 3D printing, also appeared among the most cited works, with citation counts ranging from 20 to 32.

Table 1. The top ten high impact articles published by TJO between 2017 and 2025

Title	Corresponding author	Publication year	Total citations	Average per year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Orthodontic Treatment with Clear Aligners and The Scientific Reality Behind Their Marketing: A Literature Review	Tamer	2019	92	11.5	0	0	0	2	5	14	15	31	24
Assessment of Reliability of YouTube Videos on Orthodontics	Kilinc	2019	62	7.75	0	0	0	3	9	13	15	11	10
Fixed Orthodontic Retainers: A Review	Kaya	2019	50	6.25	0	0	0	3	0	11	16	10	10
Web-based Fully Automated Cephalometric Analysis: Comparisons between App-aided, Computerized, and Manual Tracings	Meric	2020	48	6.86	0	0	0	0	1	8	15	10	12
The Prevalence of Cleft Lip and Palate Patients: A Single-Center Experience for 17 Years	Yilmaz	2019	42	5.25	0	0	0	3	8	7	5	6	8

Table 1. Continued

Title	Corresponding author	Publication year	Total citations	Average per year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Three-Dimensional Imaging in Orthodontics	Erten	2018	32	3.56	0	0	1	5	4	5	4	6	7
Evaluation of Internet Information about Lingual Orthodontics Using DISCERN and JAMA Tools	Olkun	2018	27	3	0	0	2	3	3	7	4	3	5
Microbial Colonization on Elastomeric Ligatures during Orthodontic Therapeutics: An Overview	Sawhney	2018	24	2.67	0	0	2	3	6	4	3	6	0
Directly Printed Aligner: Aligning with the Future	Panayi	2023	21	5.25	0	0	0	0	0	0	0	15	6
The Use of 3D Printers in Orthodontics-A Narrative Review	Ergul	2023	20	5	0	0	0	0	0	0	1	6	12

TJO, Turkish Journal of Orthodontics.

Authorship and collaboration patterns

A total of 851 authors contributed to the 244 publications included in this analysis, with an average of 3.5 authors per article. The average number of authors per article is a key bibliometric indicator used to assess the collaborative nature of scientific production; it is calculated using the formula: average number of authors=total number of authors/total number of articles.

Multi-authored papers comprised 94.7% of the total output (n=231), with the remaining 13 (5.3%) papers being single-authored. Gender-based authorship analysis revealed a balanced distribution. Overall, 444 (52.2%) female and 407 (47.8%) male authors were identified. Among the first authors, 134 (54.9%) were female and 109 (45.1%) were male.

Evaluation of institutional affiliations showed that 786 authors (92.4%) were affiliated with academic institutions, while 65 authors (7.6%) were affiliated with non-academic sectors, such as private practice or independent research organizations. Most contributors were from orthodontics, followed by prosthodontics, pediatric dentistry, and biostatistics.

The co-authorship network showed strong collaboration among researchers. Each node represents an author, with its size indicating the number of publications. Links between nodes represent co-authorship relationships, and color gradients show the average publication year. Many authors collaborated within the same institutions, while inter-institutional and international partnerships increased over time. Several active collaboration groups led by authors including Altug A.T., Arslan C., Ozdemir F., and Cesur E. were identified (Figure 2).

Multidisciplinary contributions

The journal included contributions from 26 disciplines beyond orthodontics, including anatomy; biomaterials and tissue engineering; bioengineering; pharmacology; otorhinolaryngology; psychology; biostatistics; microbiology; biotechnology; computer engineering; molecular biology; medical biochemistry; plastic surgery; physiology; child and adolescent psychiatry; developmental sciences; histology; occupational health; nuclear medicine; pathology; chemistry; general surgery; medical biology and genetics; and orthopedics.

Institutional and country-level contributions

Publications in the TJO between 2018 and 2024 originated from 39 different countries. The highest contributions were from Türkiye (n=37) and Türkiye (n=105), totalling 142 and representing 58.2% of all publications. The next-highest contributions were from India (n=41, 16.8%), the United States (n=16, 6.6%), and Iran (n=13, 5.3%). Additional contributions were recorded from Brazil (n=9); Italy (n=5); Cyprus, Egypt, Greece, Iraq, Saudi Arabia, Sweden, and Switzerland (each n=3); and Australia, Canada, and Malaysia (each n=2). Single-country contributions (n=1) included Austria, Azerbaijan, Cambodia, Denmark, England, Japan, Kuwait, Lebanon, Lithuania, Malta, Morocco, Nigeria, Pakistan, the People's Republic of China, Peru, Portugal, Scotland, Serbia, South Africa, Syria, the United Arab Emirates, South Korea, and Palestine. The geographical distribution of contributing countries is shown in Figure 3a.

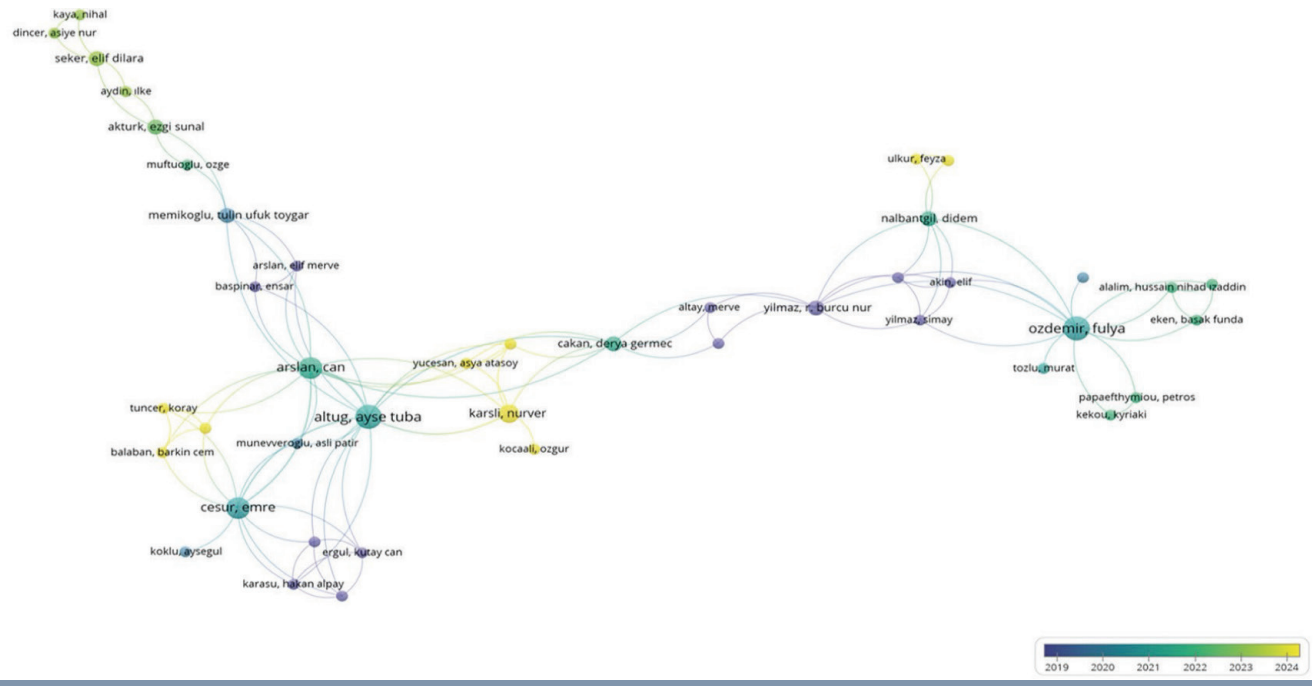

Figure 2. Co-authorship network analysis of publications in Turkish Journal of Orthodontics. Network visualization shows collaboration patterns among authors who published in TJO during the study period. Each node represents an author, with node size proportional to the number of publications. Edges (connections) between nodes indicate co-authorship relationships. Node colors indicate publication years according to the timeline shown in the bottom right corner, with a gradient shifting from purple to yellow-green. Larger nodes and multiple connections indicate authors with higher productivity and more extensive collaborative networks. The network identifies key research clusters and highlights the multidisciplinary collaborative nature of orthodontic research published in TJO. The visualization was generated using VOSviewer software. TJO, Turkish Journal of Orthodontics.

Collaboration network analysis identified Türkiye as the central hub of international partnerships, followed by India and the United States (Figure 3b). Strong collaborative links were observed between Türkiye and each of the following countries: India, the USA, and Switzerland. Additional cross-national partnerships included Canada, Iran, Serbia, Malaysia, Sweden, the UK, and Italy. Between 2018 and 2024, Türkiye and India experienced the most notable growth in publication output.

At the institutional level, Marmara University (n=15), Yeditepe University (n=13), Başkent University (n=11), and İstanbul Medipol University (n=11) published the most studies, followed by Ankara University (n=10), Bezmialem Vakıf University (n=9), and Istanbul University (n=8). The institutional collaboration network presented in Figure 4 shows that Atatürk University has the highest betweenness centrality, indicating that it plays a key bridging role by connecting otherwise weakly linked institutional clusters within the network. Other institutions, such as Marmara University and Yeditepe University, showed high publication volume but low centrality, reflecting localized research collaboration patterns.

Research topics

The WoS citation-topic analysis revealed that 199 (81.6%) publications were classified as "Dentistry & Oral Medicine". Additional topics included "Health Literacy & Telemedicine" (n=9, 3.7%), "Sleep Science & Circadian Systems" (n=7, 2.9%), and various interdisciplinary fields, including virology, psychiatry, laser therapy, and oncology (collectively 12.3%), highlighting TJO's multidisciplinary scope.

At the micro level, orthodontic treatment was the dominant topic, with 138 publications (56.6%), followed by dentin (n=23, 9.4%), dental regeneration (n=11, 4.5%), digital health literacy (n=9, 3.7%), and the temporomandibular disorders (n=9, 3.7%). Other notable topics included obstructive sleep apnea and periodontal microbiome (2.9% each), and cleft lip and palate (2.5%).

Funding and research support

The analysis revealed that 17 (7.0%) studies received support from national institutions, while 13 (5.3%) were funded by international organizations. Most publications (211 studies, 86.5%) did not report external funding sources.

Science Mapping

Citation and co-citation networks

Citation and co-citation analyses were conducted to identify the core intellectual structure of the TJO publications between 2018 and 2024 and the most influential journals cited by these publications (Figure 5). Among the cited journals, the American Journal of Orthodontics and Dentofacial Orthopedics had the highest co-citation frequency, followed by The Angle Orthodontist, European Journal of Orthodontics, and Dental Press Journal of Orthodontics. These journals occupied central positions within the network and formed the primary

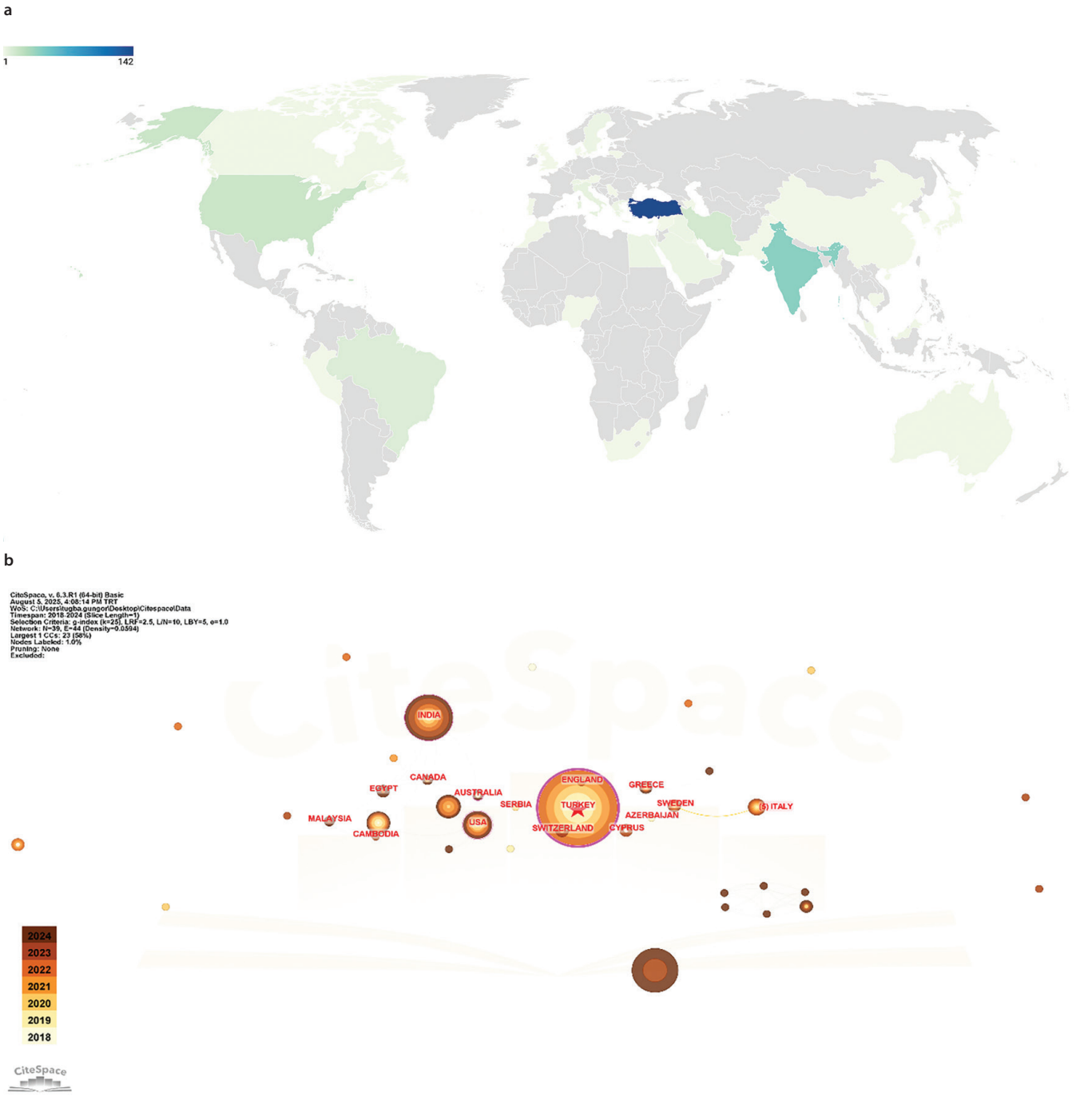

Figure 3. Geographical characteristics of Turkish Journal of Orthodontics contributions (2018-24). **(a)** World map showing geographical distribution of publications by country. Color intensity represents publication volume. The visualization was generated using Datawrapper. **(b)** International collaboration network visualized by CiteSpace 6.3.R1 and showing co-authorship patterns between countries. Node size represents publication productivity, and connecting lines indicate collaborative relationships.

knowledge base supporting TJO publications. Other frequently cited sources included the Journal of Orofacial Orthopedics, the Korean Journal of Orthodontics, and the Seminars in Orthodontics.

Keyword co-occurrence analysis

The network visualization map was generated using CiteSpace 6.3.R1 to illustrate the co-occurrence and temporal distribution of keywords (Figure 6). Each node represents a keyword, with node size proportional to occurrence frequency. The largest connected component comprises 169 nodes, representing 84% of the network. Lines connecting the nodes indicate co-occurrence relationships between keywords, with line thickness representing the strength of association (network density=0.0243). Node colors correspond to the year of first appearance, ranging from purple (2018) to dark red (2024), as indicated in the temporal legend.

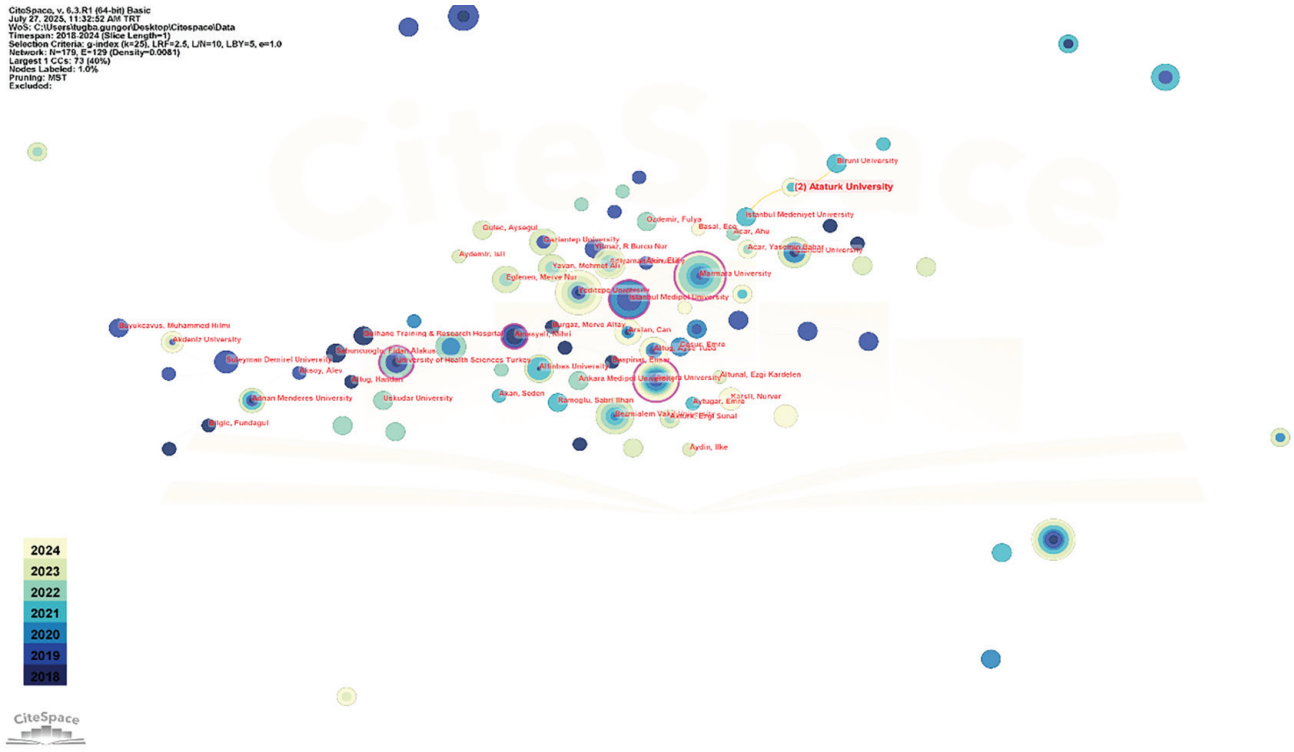

Figure 4. Institutional collaboration network of Turkish Journal of Orthodontics (2018-24). The network visualization, generated by CiteSpace 6.3.R1, shows research institutions and their collaborative relationships. Node size reflects publication volume, while betweenness centrality reflects the extent to which an institution acts as a bridge connecting otherwise separate collaboration clusters within the network. Temporal rings represent the progression of institutional activity over time.

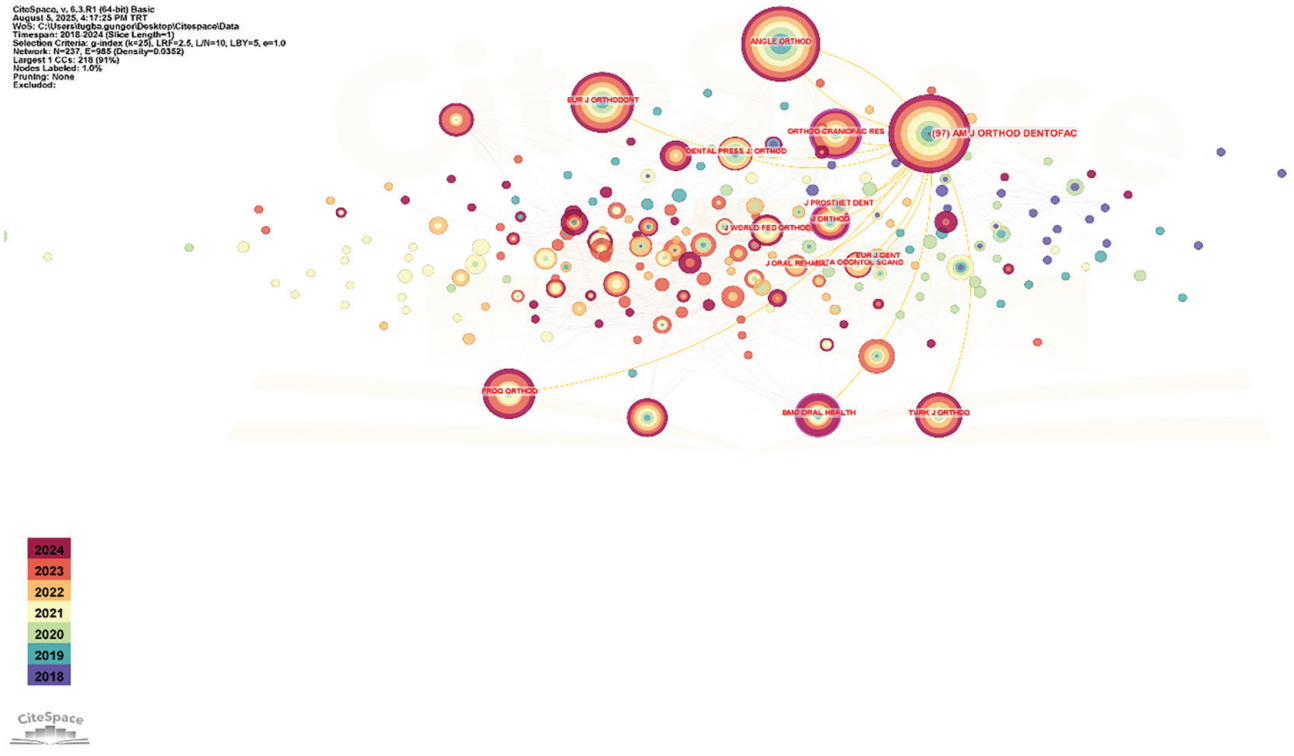

Figure 5. Citation network of journals most frequently cited by Turkish Journal of Orthodontics publications (2018-24). Node size represents citation frequency, and lines indicate co-citation relationships. Temporal rings illustrate citation activity over time. The network was generated using CiteSpace 6.3.R1 (i.e., tree-ring history visualization).

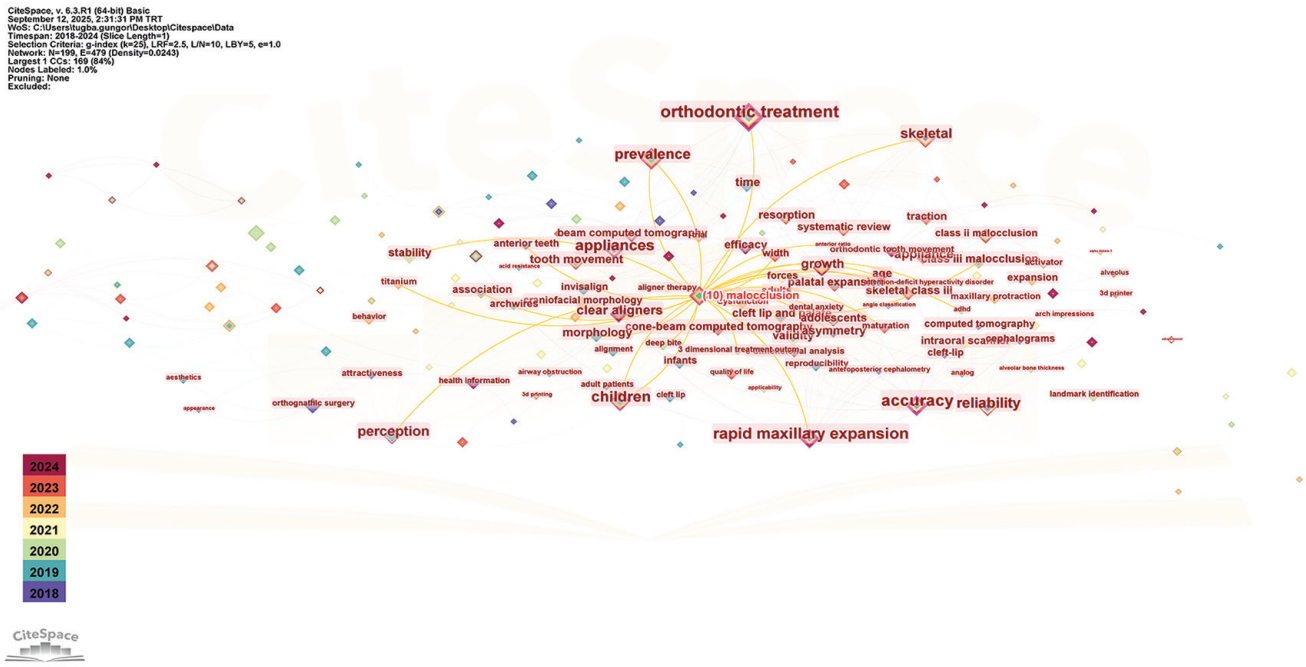

Figure 6. Keyword co-occurrence network generated using CiteSpace and based on publications indexed between 2018 and 2024. 169 keywords were grouped into five thematic clusters, with modularity (Q=0.69) and silhouette (S=0.86) values indicating a well-structured and internally consistent network. In the visualization, node size reflects keyword frequency, while link thickness represents the strength of co-occurrence between keywords. Colors correspond to the time of appearance of keywords, ranging from earlier publications (blue–green) to more recent (yellow–red) publications. The identified clusters represent major research themes, including orthodontic treatment modalities (e.g., appliances, clear aligners, and Invisalign), diagnostic approaches (e.g., cone-beam computed tomography and cephalograms), clinical outcomes (e.g., accuracy, reliability, and skeletal Class II/III malocclusion), treatment planning strategies (e.g., rapid maxillary expansion and tooth movement), and patient-related factors (e.g., children, adolescents, and cleft lip and palate).

Keyword co-occurrence analysis revealed 169 keywords forming five distinct thematic clusters (modularity Q=0.69, silhouette S=0.86), indicating well-defined research areas. Major thematic clusters include: orthodontic treatment modalities (e.g., appliances, clear aligners, and Invisalign), diagnostic approaches (e.g., cone-beam computed tomography and cephalograms), clinical outcomes (e.g., accuracy, reliability, and skeletal Class II/III malocclusion), treatment planning (e.g., rapid maxillary expansion and tooth movement), and patient-specific factors (e.g., children, adolescents, and cleft lip and palate).

The analysis showed a chronological shift in thematic emphasis. Earlier publications (2018-20) primarily focused on malocclusion, bonding, and growth assessment, whereas studies published after 2022 increasingly addressed clear aligner systems, digital orthodontic techniques, and artificial intelligence-based diagnostic tools.

DISCUSSION

This study provides a comprehensive bibliometric analysis of the publication characteristics and academic impact of TJO since its inclusion in WoS. Although TJO was indexed in WoS in 2017, this bibliometric analysis focused on data from 2018 onward, as the first year of meaningful citation accumulation typically follows the year of initial indexing.[3] A total of 244 articles published over a 7-year period were analyzed. The data show consistent publication activity, wider international participation, and increasing citation counts, pointing to the journal's ongoing growth and recognition in orthodontic research.

The analysis showed that the number of publications remained relatively stable between 2018 and 2024, ranging from 23 to 40 articles per year. Despite small variations, citation counts increased steadily, indicating growing scientific interest in studies published in TJO. The citation peak in 2024 indicates that papers from previous years have gained greater visibility within the orthodontic community. The apparent decline in 2025 could be attributed to incomplete data for that year, as full publication and citation records had not yet been incorporated at the time of analysis; therefore, it should not be interpreted as a true decrease in performance.

Publication activity during 2020 and 2021 overlapped with the COVID-19 pandemic, which interrupted clinical research and workflows, and reduced access to patient data.[12,13] Despite these difficulties, TJO maintained a relatively stable number of publications, demonstrating both editorial stability and the dedication of its contributors.

A clear change in publication patterns was observed after 2022. Although case reports were still being accepted for evaluation according to the journal's submission guidelines, no case reports were identified in the dataset after the third quarter of

2022, and systematic reviews began to appear in 2023.[14] Similar trends have been reported in the literature on orthodontics. Papageorgiou et al.[15] showed that the number of systematic reviews in orthodontics increased with time while Almotairy[16] reported a continued rise in systematic review publications across major orthodontic journals, highlighting their growing role in evidence-based practice. Case reports continue to have educational and clinical value, particularly in documenting rare or unique clinical scenarios.[17-19] However, because they are based on individual or limited clinical observations, their findings are inherently less generalizable and may attract fewer citations compared with broader analytical study designs.[20] In contrast, systematic reviews synthesize available evidence and typically provide higher-level evidence, potentially contributing to broader academic visibility and citation performance.[21]

An important finding of this analysis concerns the relationship between short-term and long-term citation metrics. Although TJO currently holds a clarivate impact factor of 1,5, the calculated average number of citations per article was 5.77, which is substantially higher than the impact factor would suggest. This discrepancy merits careful interpretation and highlights important distinctions between different bibliometric indicators.

The impact factor represents the average number of citations received in a particular year by articles published in the preceding 2 years, thus reflecting short-term citation performance within a narrow temporal window. This metric is inherently limited to recent publications and only captures the immediate impact.[22,23] In contrast, the average number of citations per article calculated in this analysis encompasses all publications from 2018 to 2024 and includes citations accumulated over variable time periods, thus providing a broader view of the journal's cumulative influence.

This substantial difference between the impact factor and the overall average number of citations per article suggests that many articles published in TJO continue to receive citations well beyond the 2-year citation window used to calculate the impact factor. This pattern indicates long-term relevance and sustained academic interest in the journal's content. Articles addressing foundational topics, methodological innovations, or comprehensive reviews can accumulate citations over extended periods as they become established references. Furthermore, the 5-year impact factor of 1.5 and the Scopus CiteScore of 2.0 provide additional perspectives on the journal's citation performance across different timeframes and indexing systems. The results indicate that TJO publications receive ongoing attention from researchers beyond their initial release. This finding underscores the value of using multiple bibliometric indicators rather than relying exclusively on the traditional 2-year impact factor when evaluating journal performance and research impact.

The h-index of 15 indicates consistent impact: 15 articles were cited at least 15 times, reflecting sustained rather than short-term influence.[24]

Among the top ten most-cited articles published by TJO between 2018 and 2025, the most common research themes were artificial intelligence applications, clear aligner therapy, temporomandibular disorders, and airway changes. The prominence of these topics can be explained by the growing popularity of clear aligner treatments and an increasing interest in the potential use of artificial intelligence in orthodontics. These topics represent modern, technology-driven areas that continue to attract attention and receive an increasing number of citations within recent orthodontic literature.[24] Furthermore, the number of publications related to clear aligner therapy more than quadrupled between 2020 and 2024, with the American Journal of Orthodontics and Dentofacial Orthopedics and the Angle Orthodontist being the leading outlets for this type of research.[25] The results of the present study are consistent with these findings and show that technology-oriented topics, such as artificial intelligence and aligners, have become major areas of interest in recent orthodontic research.

The methodological pattern in TJO publications reflects the diverse nature of orthodontic research. Most studies were clinical (52.5%), especially observational ones (32.8%), which are practical for evaluating treatment outcomes and growth patterns.[26] Since orthodontic treatment spans long periods, interventional studies are often difficult to conduct. In recent years, there has been a growing preference for retrospective study designs.[26] A considerable portion of TJO research (36.0%) was non-patient-based including finite element analyses, surveys, and bibliometric studies. These approaches show that orthodontic research is expanding beyond traditional clinical designs to include computational and secondary data analyses that do not require ethical approval.

The journal's multidisciplinary scope, evidenced by contributions from 26 disciplines beyond orthodontics, underscores its recognition that orthodontic treatment intersects with craniofacial growth, temporomandibular disorders, sleep-disordered breathing, psychological well-being, and systemic health considerations. This interdisciplinary approach enriches the journal's content and reflects contemporary understanding that orthodontic care requires the integration of knowledge across multiple domains.

From the perspective of international collaboration, TJO has a strong national base and a growing international reach. Most publications come from Türkiye (58.2%), reflecting the importance of the journal of the Turkish Orthodontic Society, with India emerging as the second-largest contributor (16.8%).

The network analysis revealed Türkiye's central position as a collaboration hub, maintaining partnerships across multiple continents including Asia (eg. India), North America (eg. USA and Canada), Europe (e.g., Switzerland, Sweden, UK, and Italy), and other regions (eg. Serbia, Malaysia, and Iran). This bridging role facilitates knowledge exchange between different research traditions and clinical approaches, potentially enriching the global orthodontic evidence base.

Contributions from 39 countries, including 22 single-publication countries (e.g., Cambodia, Lithuania, Morocco, Palestine, and Peru), highlight TJO's accessibility to researchers from emerging scientific regions. However, international co-authorship remains infrequent, indicating the need for stronger global collaborations to support knowledge exchange and innovation in orthodontic research.

Publications were predominantly produced by a small number of research-active universities, but contributions were shared across several institutions, indicating a balanced, healthy research environment. The five most productive institutions- Marmara University, Yeditepe University, Başkent University, Istanbul Medipol University, and Ankara University- collectively contributed 50 publications (20.5%), indicating a moderate rather than an extreme concentration. This pattern indicates a balanced research environment with several active institutions rather than one dominant center. The identification of Atatürk University as a central node in the institutional collaboration network, despite not ranking among the top five in absolute publication volume, highlights the distinction between productivity and influence. As such, research impact was not solely determined by publication numbers.

Authorship analysis showed an approximately balanced gender distribution (52.2% female, 47.8% male), with slightly more female than male authors. While male authors have traditionally dominated scientific publishing, recent studies indicate a positive shift in orthodontic research toward greater female representation.[27,28]

Most TJO papers (94.7%) were written by multiple authors, with an average of 3.5 authors per article, which is indicative of strong collaboration among researchers. Since most authors were from universities (92.4%), the journal primarily represents academic research, with limited contributions from clinicians in private practice.[24,25]

The most-cited articles and keyword-cluster analysis highlight the journal's thematic priorities and emerging research frontiers. The prominence of digital technologies among highly cited works, including automated cephalometric analysis, directly printed aligners, and artificial intelligence applications, reflects orthodontics' ongoing digital transformation.[29-31]

The keyword co-occurrence analysis revealed a temporal shift from traditional treatment approaches toward advanced digital technologies and patient-centered orthodontics.

Traditional research topics, including skeletal classifications, growth assessment, bracket bonding, and maxillary expansion, maintained a consistent presence throughout the study period. The sustained research attention to temporomandibular disorders, sleep-disordered breathing, and airway considerations reflects an expanding recognition that orthodontic treatment intersects with broader health outcomes beyond dental alignment.

Study Limitations

Recent publications (2023-24) have had limited time to accumulate citations, which may lead to an underestimation of their eventual impact. Although the use of standardized vocabularies such as MeSH is recommended for bibliometric accuracy, the keywords analyzed in this study were predominantly author-defined rather than MeSH-standardized, which potentially affected the consistency of keyword clustering and co-occurrence mapping. In addition, WoS coverage might not fully capture all collaboration patterns, particularly those involving journals or emerging research groups not indexed in WoS, which could lead to an underrepresentation of specific types of collaborations.

CONCLUSION

This bibliometric analysis demonstrates that TJO has shown consistent growth in scientific visibility, citation impact, and international participation since its inclusion in the Web of Science. The journal reflects both established orthodontic research themes and emerging trends, particularly in digital orthodontics, clear aligner therapy, and artificial intelligence applications. The increasing presence of systematic reviews and multidisciplinary contributions further indicates a progressive shift toward evidence-based and collaborative research. Continued efforts to support international collaboration, methodological diversity, and rigorous reporting standards may further strengthen the journal's academic influence and long-term contribution to orthodontic literature.

Ethics

Ethics Committee Approval: As this study analyzed publicly available data from the Web of Science database, it was granted exempt status.

Informed Consent: Not applicable, as the study was based on publicly available bibliometric data and did not involve human participants.

Footnotes

Author Contributions: Concept - A.A., B.S.A.; Design - A.A., B.S.A.; Data Collection and/or Processing - A.A., T.G., B.S.A.; Analysis and/or Interpretation - A.A., T.G., B.S.A.; Literature Search - A.A., B.S.A.; Writing - A.A., B.S.A.

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