Cumhuriyet Dental Journal, 28(4): 545-551, 2025
DOI: https://doi.org/10.7126/cumudj.1722091

Cumhuriyet Dental Journal

| cdj.cumhuriyet.edu.tr | Founded: 1998 Available online, ISSN: 1302-5805 Publisher: Sivas Cumhuriyet Üniversitesi

Research Performance of Turkish Endodontists: A National Analysis

Merve Gökyar[1,a,*], İdil Özden[1,b], Hesna Sazak Öveçoğlu[1,c]

[1]*Department of Endodontics, Faculty of Dentistry, Marmara University, İstanbul, Türkiye.*
**Corresponding author*

Research Article

History

Received: 18/06/2025
Accepted: 23/10/2025

ABSTRACT

Objectives: The aim of this study is to evaluate the scientific performance and academic productivity of Turkish endodontists in detail. The study seeks to assess the research productivity, impact, and developments in the field of endodontics at both national and international levels, with the goal of providing a reference to better understand the contribution of Turkish endodontic research to the global scientific community.

Materials and Methods: In this study, conducted using the Web of Science database, a detailed search was performed using the keywords 'endodontics*' OR 'root canal treatment*' OR 'root canal therapy*'. Subsequently, a year filter was applied to select studies published between 2014 and 2024, and a country filter was used to select 'TURKEY' and 'TURKIYE.' For data visualization, the VOSviewer software was employed, while Microsoft Excel was used for tabulation.

Results: An analysis of studies conducted in the last 10 years reveals that Turkey ranks 6th among all countries. The highest number of publications occurred in 2023, and the number of publications has steadily increased over the years. The most productive researchers are Hakan Arslan, Cangül Keskin, and Taha Özyürek. The institutions with the highest number of publications are Hacettepe University, Ondokuz Mayıs University, and Ankara University. Regarding the journals in which the publications were published, the Journal of Endodontics ranks first.

Conclusions: The contributions of Turkish endodontists to the international scientific community significantly impact the development of endodontic practice and provide a crucial foundation for further research in this field. This lays the groundwork for the emergence of new treatment approaches and the deepening of future studies.

Keywords: Bibliometrics, endodontics, research productivity, Turkey

Türk Endodontistlerin Araştırma Performansı: Ulusal Bir Analiz

Araştırma Makalesi

Süreç

Geliş: 18/06/2025
Kabul: 23/10/2025

ÖZ

Amaç: Bu çalışmanın amacı, Türk endodontistlerin bilimsel performansını, akademik üretkenliklerini ayrıntılı bir şekilde değerlendirmektir. Çalışma, Türk endodontistlerin ulusal ve uluslararası düzeydeki araştırma üretkenliğini, etkilerini ve bu alandaki gelişmeleri izlemeyi hedeflemekte olup, Türk endodonti araştırmalarının global bilimsel topluluğa katkısını daha iyi anlamaya yönelik bir referans oluşturmayı amaçlamaktadır.

Gereç ve Yöntemler: Web of Science veri tabanı kullanılarak gerçekleştirilen bu çalışmada, 'endodontics*' OR 'root canal treatment*' OR 'root canal theraphy*' anahtar kelimeleri kullanılarak detaylı bir arama yapılmıştır. Daha sonra yıl filtresi ile 2014-2024 yılları arasındaki çalışmalar, ülke filtresi kullanılarak da 'TURKEY' ve 'TURKIYE' seçilmiştir. Verilerin görselleştirilmesi için VOSviewer programı, tablolaştırma için ise Microsoft Excel programı kullanılmıştır.

Bulgular: Son 10 yılda yapılan çalışmalar incelendiğinde, Türkiye'nin tüm ülkeler arasında 6. sırada yer aldığı görülmektedir. 2014-2024 seneleri arasında en fazla yayın 2023 yılına aittir ve seneler geçtikçe yayın sayısının arttığı görülmektedir. En üretken akademisyenler; Hakan Arslan, Cangül Keskin ve Taha Özyürek olmuştur. En fazla yayın sayısına sahip kurumlar; Hacettepe Üniversitesi, Ondokuz Mayıs Üniversitesi ve Ankara Üniversitesi olmuştur. Yayınların yayınlandıkları dergiler incelendiğinde ise, ilk sırayı Journal of Endodontics almaktadır.

Sonuçlar: Türk endodontistlerin uluslararası bilimsel alandaki katkıları, endodonti pratiğinin gelişmesine önemli ölçüde etki etmekte ve gelecekte bu alandaki araştırmaların daha da derinleşmesi, yeni tedavi yaklaşımlarının ortaya çıkması için önemli bir zemin hazırlamaktadır.

Anahtar Kelimeler: Bibliyometri, endodonti, araştırma üretkenliği, Türkiye

Copyright

This work is licensed under Creative Commons Attribution 4.0 International License

[a] *mervegokyar@gmail.com* *0000-0002-2735-156X*
[c] *idil.akman94@gmail.com* *0000-0003-4709-422X*
[b] *hsazak@marmara.edu.tr* *0000-0003-0838-4355*

How to Cite: Gökyar M, Özden İ, Sazak Öveçoğlu H. (2025) Research Performance of Turkish Endodontists: A National Analysis, Cumhuriyet Dental Journal, 28(4): 545-551.

Introduction

Clarivate Analytics' Web of Science is one of the most widely used and prestigious global platform citation search, discovery, and analysis. It functions both as a library tool for academic research and as a comprehensive source for large-scale, data-driven studies across disciplines. The database contains millions of bibliographic records, billions of citation links and extensive metadata, with thousands of new items added daily. It hosts publications dating back to 1945 and

allows users to perform advanced, general, and citation reference searches using keywords.[1]

Bibliometric analysis is a computer-assisted method that examines academic publications within a specific field to uncover relationships among authors, institutions, and countries.[2] This approach uses citation data to demonstrate the impact and intellectual flow of publications, often presenting citation counts over time through visualizations.[3] Scientometric analysis, a complementary in-depth method, applies to bibliometric data with the aim of generating insights through visual tools such as keyword, author, and country mapping. This enables readers to better understand the complexity of a topic and explore its knowledge domain through mapping techniques.[4]

One of the common methods to measure research productivity is bibliometric analysis, which uses publication and citation counts obtained from databases, sometimes combined with national or institutional research and development data. This method helps identify trends at the levels of country, institution, and discipline. However, when assessing the productivity of individual researchers, it may fall short in terms of inclusivity, especially regarding academic discipline, publication type, and language. For this reason, some researchers prefer to evaluate individual productivity through surveys completed by academics rather than relying solely on bibliometric data.[5]

The research productivity and advancement of countries are not limited to technological development; they are also linked to multidimensional progress and welfare levels in economic and social spheres. These factors show how a country's scientific and academic achievements interact with and reinforce social development and living standards.[6] In addition to institutional models such as entrepreneurial and globally recognized universities, the widespread use of competitive evaluation tools like university ranking systems has encouraged administrations to hire highly productive researchers and reward performance in internal promotions. These dynamics lead universities to make strategic decisions aimed at enhancing academic success and shaping performance metrics.[7] For these reasons, many countries expect higher levels of research productivity from academics, and these expectations are continually increasing.

Three key metrics of international publication activity are widely accepted for determining the global ranking of countries in scientific fields, comparing the quality of universities or countries, and evaluating the researcher performance: 1) the number of articles published in international journals, 2) the number of articles in journals indexed by scientific databases, and 3) the number of citations received. Indices based on international publications and citations, developed by institutions in the United States and Europe, have been increasingly used by universities and countries to assess scientific performance. In this context, publication indices have also been recognized as a fundamental indicator for academic promotion and performance evaluations at universities in Turkey.[8]

As of 2024, Turkey has 105 dental faculties, with 12 more yet to begin their educational programs. By 2022, the total number of faculty members reached 2,599, including 826 professors, 457 associate professors, and 1,316 assistant professors (tdb.org.tr). In recent years, policies aimed at increasing research productivity in higher education have become increasingly prominent. Since 2015, the research, projects, and publications of academics at state universities have been evaluated according to specific numerical targets and criteria, with financial incentives provided to encourage these activities.[9]

In Turkey, the Scientific and Technological Research Council of Turkey (TÜBİTAK) and universities promote and reward works indexed in international publication databases in various ways. The International Scientific Publications Incentive Program, operated by TÜBİTAK, encourages researchers working at universities and public or private sector research centers to publish internationally, offering incentives in the fields of basic sciences, health sciences, and engineering.[10] Similarly, updated regulations for appointment and promotion to associate professorship and faculty positions require applicants to publish in international and national indexed journals, according to criteria set by the Interuniversity Council or individual universities. These publications must meet specific quantity and point-value thresholds.[11,12] Recent studies also indicate that Turkey has experienced a significant increase in research and development expenditures, resulting in a notable rise in international publications.[13]

It is important to independently assess the scope and impact of the endodontic literature produced in Turkey. The results of this research will serve as a reference for future studies. Therefore, this study aims to provide a detailed evaluation of the scientific performance and academic productivity of Turkish endodontists by examining the bibliometric characteristics of endodontic publications indexed in the Web of Science between 2014 and 2024.

Materials and Methods

The dataset was retrieved from the Web of Science Core Collection (Clarivate Analytics), a globally recognized citation database, between late December 2024 and early January 2025. A search was conducted in the main search box using the terms 'endodontics*' OR 'root canal treatment*' OR 'root canal therapy*' (All Fields). Then, a year filter was applied to select publications from the years 2014 to 2024. To achieve the primary objective, the global publication growth in the field of endodontics was first assessed. During this process, no country or region filter was applied. After obtaining the global intellectual landscape, the country filter was applied, and Turkey was selected (TURKEY and TURKIYE). Subsequently, specific characteristics of the endodontic literature contributed by authors from Turkey were analyzed. All publications categorized as 'articles' (including case reports) and 'review papers' written in English, authored by at least one Turkish researcher, and published in the field of endodontics were included. Publications categorized as early access, editorial material, corrections, letters, retractions, retracted publications, and conference proceedings were excluded.

For each article, the following information was recorded: the journal in which it was published, the article title, publication year, citation count, author names, and affiliations.

The retrieved records were exported in a Tab Delimited File format. Bibliometric analysis of the data and its visualization were performed using VOSviewer (version 1.6.20) (Center for Science and Technology Studies, Leiden University), while Microsoft Excel (Microsoft, Inc., Redmond, Washington) was used for data tabulation. Since this research involved bibliometric data only and did not include clinical studies or patient information, ethical approval was not required. This study did not involve human or animal participants; therefore, no ethics committee approval was required, in accordance with the Declaration of Helsinki.

Statistical Analysis

All data were processed and organized using Microsoft Excel (Microsoft Corp., Redmond, WA, USA). Visualizations including co-authorship networks and keyword mapping, were generated using VOSviewer (version 1.6.20; Leiden University, Netherlands). Since this study involved descriptive evaluation of publication metadata without hypothesis testing, no further statistical analysis was performed. Although a steady upward trend in publication numbers was observed, no inferential statistical tests (e.g., trend analysis) were applied, as the study aimed to provide a descriptive bibliometric overview rather than hypothesis-driven inference.

Results

The initial search yielded 33,237 records. After applying the exclusion criteria, studies published between 2014 and 2024 were selected. Without applying a country filter, 904 publications were identified in 2014 and 1,460 in 2024. During this period, Turkey ranked sixth in total publication output. The countries with the highest numbers of publications were the USA, Brazil, and India, respectively (Table 1).

Table 1. Most productive countries in endodontics research from 2014 to 2024

Country	Publication count
United States	1953
Brazil	1947
India	1521
China	1221
Saudi Arabia	902
Turkey	713
Italy	651
Iran	538
Germany	502
England	449

After applying the country filter (selecting TURKEY and TURKIYE as countries/regions), a total of 908 results were obtained. The annual distribution of these publications was as follows: 69 in 2014, 82 in 2015, 82 in 2016, 77 in 2017, 71 in 2018, 65 in 2019, 92 in 2020, 86 in 2021, 91 in 2022, 99 in 2023, and 94 in 2024. The highest number of publications was observed in 2023.

When examining the most productive academics, Hakan Arslan was identified as the researcher with the highest output in the past 10 years, with 52 publications and 1,296 citations (without the requirement of first authorship). He was followed by Cangül Keskin with 32 publications (484 citations) and Taha Özyürek with 28 publications (637 citations). Based on citation counts, Hakan Arslan again ranked first with 1,296 citations, followed by İsmail Davut Çapar with 717 (18 publications) and Taha Özyürek, third with 637. Figure 1 shows the relationship between co-authors over the years.

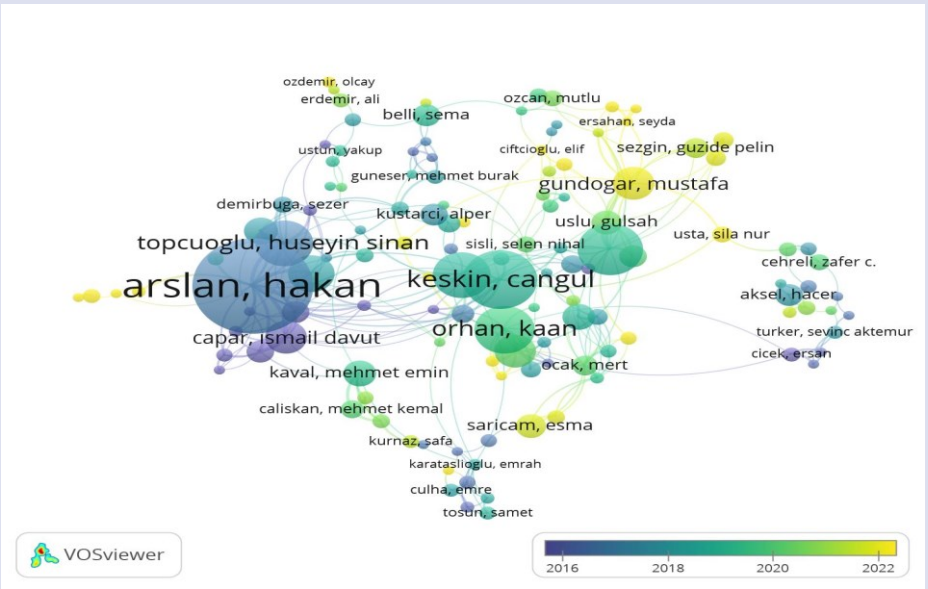


Figure 1. Relationships between co-authors over the years.

When examining citation counts, the most cited study was published in 2014 in the *Journal of Endodontics* by İsmail Davut Çapar, receiving 139 citations (Comparative Study of Different Novel Nickel-Titanium Rotary Systems for Root Canal Preparation in Severely Curved Root Canals). The second most cited paper, also from 2014, appeared in the *International Endodontic Journal* and was authored by Jale Tanalp and Tufan Güngör (125 citations; Apical extrusion of debris: a literature review of an inherent occurrence during root canal treatment). The third most cited article, from 2015, was published in the *Journal of Endodontics* by Tuğba Bezgin and colleagues (122 citations; Efficacy of Platelet-rich Plasma as a Scaffold in Regenerative Endodontic Treatment). Among the ten most cited papers, six were published in the *Journal of Endodontics* and three in the *International Endodontic Journal*. Figure 2 illustrates the relationship between publication and citation counts by year.

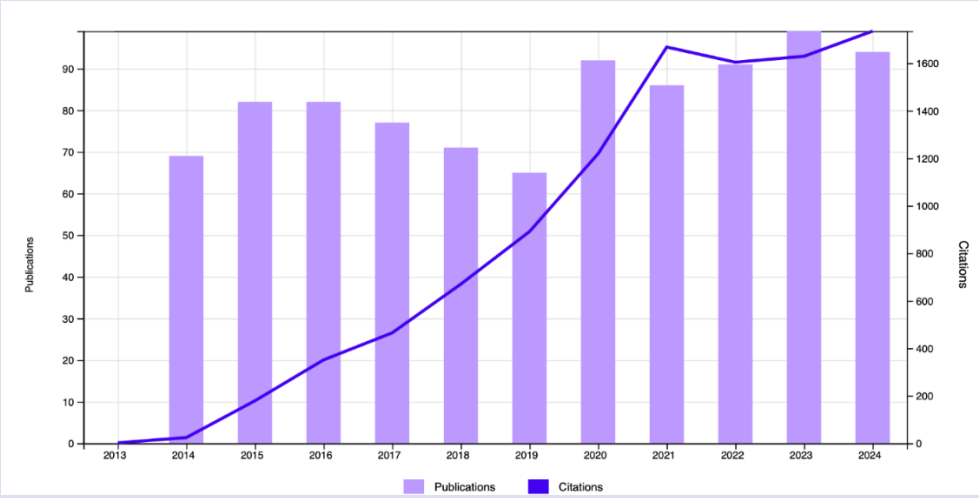


Figure 2. Distribution of the number of publications over the years.

Among the institutions with the highest publication output, Hacettepe University ranked first with 71 publications and 1,080 citations, followed by Ondokuz Mayıs University with 70 publications and 1,254 citations. Ankara University (68 publications; 977 citations), Atatürk University (64 publications; 1,291 citations), and Erciyes University (52 publications; 712 citations) also ranked among the top contributors. Figure 3 illustrates the relationships among the most productive institutions.

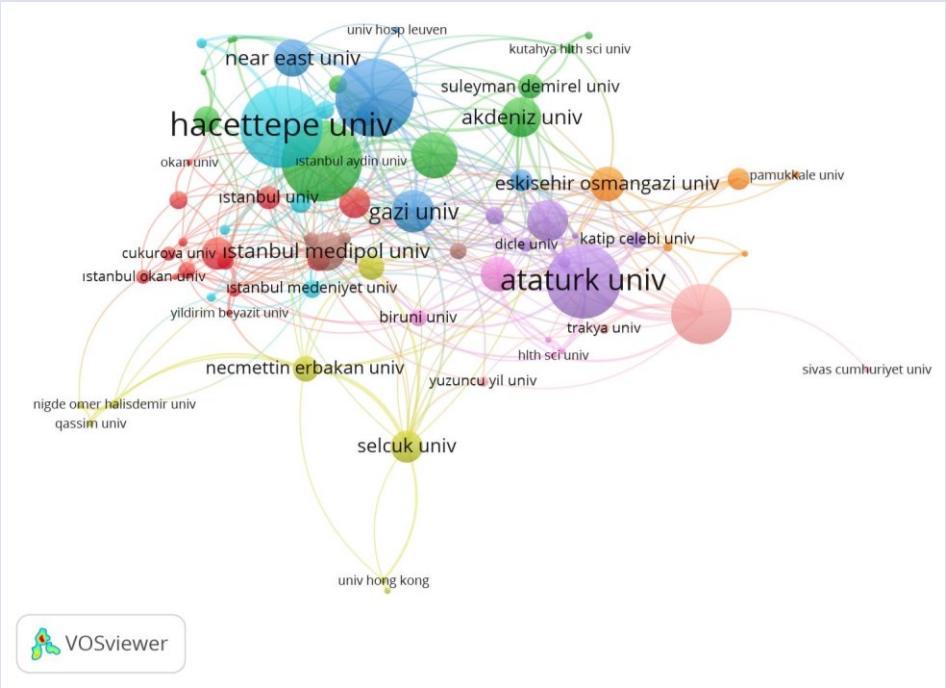


Figure 3. Visualization of collaborating authors' institutions.

The most frequently used keywords were endodontics (196), root canal treatment (52), postoperative pain (47), cone-beam computed tomography (38), and retreatment (38) (Figure 4).

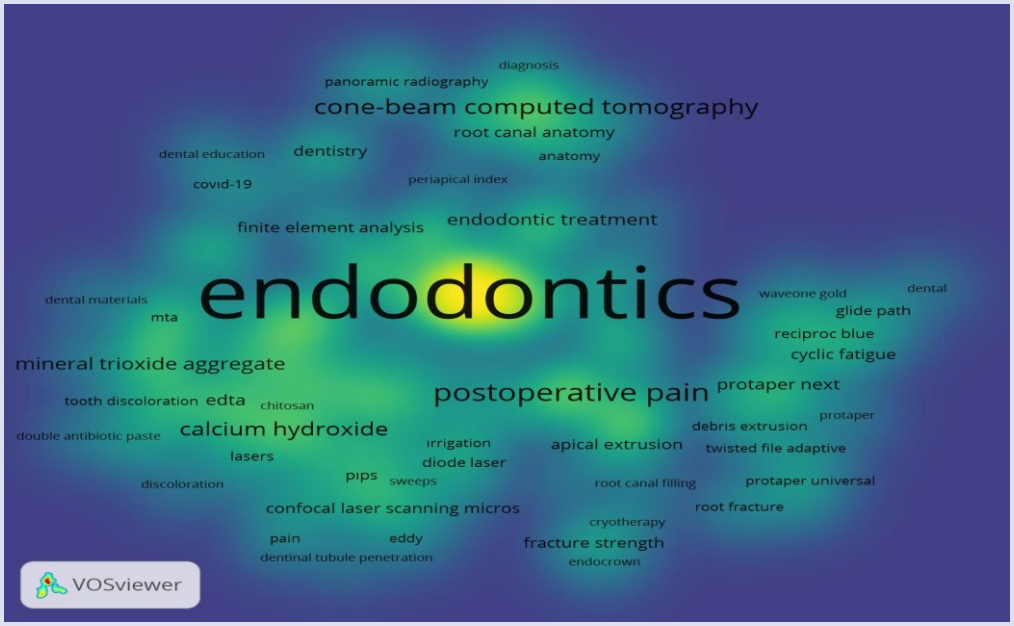


Figure 4. Commonly used keywords.

Among the journals in which the studies were published, the *Journal of Endodontics* ranked first with 186 publications, followed by the *International Endodontic Journal* (41 publications), the *Australian Endodontic Journal* (40), and the *Nigerian Journal of Clinical Practice* (37) (Figure 5).

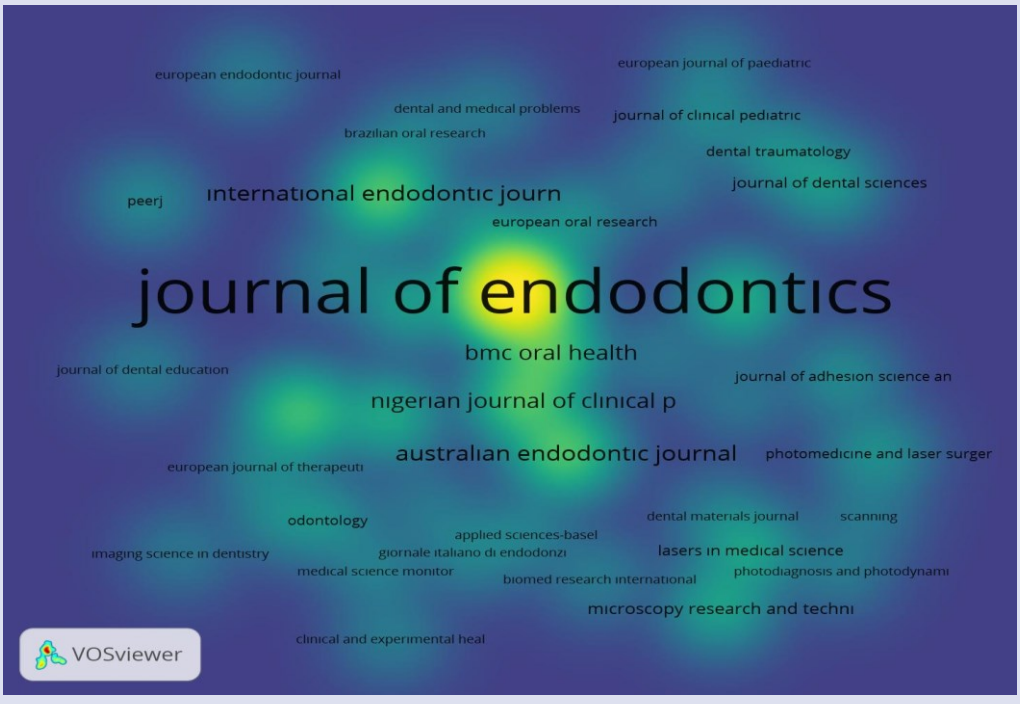


Figure 5. Leading journals.

Discussion

Research is a fundamental element of any field of knowledge, and evaluating scientific communication within a specific area provides valuable insights for understanding its development.[14] Bibliometric analysis is an effective research method commonly used to examine the quality and characteristics of published works.[15]

More than a quarter of global endodontic research is produced by Brazil and the United States, with hold a

significant share in this field. These countries, along with several in Europe, established modern research institutions many years ago and have long prioritized scientific activity, enabling them to achieve strong research productivity. Such progress is possible only in environments with favorable economic conditions. Consequently, countries facing socio-economic challenges or limited research infrastructure have generally contributed less to research output.[16] Turkey, by contrast, is a relatively young in terms of modern higher education and research infrastructure. In recent years, budget allocations for the education sector have increased significantly, a finding that aligns with the results of the present study.[13] When examining endodontic research between 2014 and 2024, the United States and Brazil ranked first and second, while Turkey ranked sixth overall.

The total number of endodontic publications from Turkey in 2024 was higher than in 2014, reflecting the country's progress in scientific research and academic productivity. In recent years, the strengthening of research infrastructure, expansion of international collaborations, and the influence of scientific incentive programs have significantly contributed to this upward trend. These findings suggest that Turkey is experiencing sustained growth in its global research share in endodontics. Moreover, this increase is expected to become even more pronounced as research policies are reinforced and scientific support continues to expand. This pattern is consistent with global trends indicating a steady increase in research output and international collaboration within the field of endodontics.

Some influential journals in a specific field account for a significant portion of the published literature.[17] This trend is also evident in the present study. The two highest-impact journals in endodontics - *Journal of Endodontics* and *International Endodontic Journal* - have been the most frequent publication venues for Turkish endodontists over the past decade. Articles appearing in these high-impact journals are more likely to receive citations due to their wider visibility and recognition in the scientific community.[18] Consistent with this, six of the ten most cited papers in the present study were published in the *Journal of Endodontics*. A high impact factor reflects the prestige and scientific influence of a journal, making it a preferred publication platform for researchers. This, in turn, motivates authors to select such journals for their work, given the higher likelihood of widespread dissemination and citation.

The findings of this study indicate that selected keywords play a crucial role in identifying trends within the existing publications. Keywords acts as a coded message, helping researchers gain a comprehensive understanding of the literature. By emphasizing core themes and concepts, they enable researchers to navigate large volumes of work and identify emerging areas of interest.[19] In this context, the careful selection of appropriate keywords is essential for accurately defining the literature.[20] When searching for specific topics, researchers tend to use terms that are commonly adopted in their field. Consequently, frequently used keywords help them locate relevant articles more quickly and effectively. In the present study, following *endodontics* and *root canal treatment,* the most common keywords were *postoperative pain*, *cone-beam computed tomography*, and *retreatment*. This pattern suggests that current research trends reflect the main directions of investigation over the past decade and may provide guidance for future studies.

In the present study, the publications and academic productivity of Turkish endodontists over the past decade were evaluated using the Web of Science database. A review of the literature indicates that no comparable study has been conducted in Turkey, although similar analyses have been performed in other countries.[21,22] Accordingly, this study may serve as a reference and guide for future research.

Study Limitation

This study has several limitations that should be acknowledged.

First, the bibliometric analysis was based solely on data retrieved from the Web of Science database. As a result, publications indexed in other databases such as Scopus, PubMed, or Embase were not included, which may have led to an underestimation of the total number of endodontic publications from Turkey.

Second, the search strategy relied on a limited set of keywords ("endodontics*", "root canal treatment*", and "root canal therapy*"), which, although comprehensive, may have excluded relevant studies that did not explicitly use these terms in their titles, abstracts, or keywords.

Third, the study did not distinguish between publication types beyond excluding non-article categories (e.g., editorials, letters), potentially overlooking the quality or study design of the included articles. In addition, while publication and citation counts were considered, author-level performance indicators such as h-index or m-index were not included, which may limit the depth of individual productivity analysis.

Finally, citation counts were used as a measure of impact, but citations can be influenced by factors unrelated to scientific quality, such as self-citation practices or journal visibility.

Future research could incorporate multiple databases, broader search strategies, and qualitative assessments to provide a more comprehensive analysis of Turkish endodontic research performance.

Conclusions

This bibliometric analysis highlights the growing scientific contributions of Turkish endodontists to the international research landscape over the past decade. The steady increase in publication activity reflects both the enhanced research capacity and the growing global integration of Turkish academia in the field of endodontics. These findings not only underscore Turkey's rising visibility in scientific output but also establish a solid foundation for future collaborative and high-impact research initiatives. Continued support for research

excellence and international collaboration will be essential to further advancing Turkey's position within the global endodontic community.

Acknowledgements

No source of funding was used to assist in the preparation of this paper.

Conflicts of Interest Statement

The authors declare that they have no conflict of interest.

References

1. Clarivate Analytics. Web of Science Core Collection. Available at: https://clarivate.com/products/web-of-science/ Accessed: January 1, 2025.
2. Han J, Kang HJ, Kim M, Kwon GH. Mapping the intellectual structure of research on surgery with mixed reality: bibliometric network analysis (2000–2019). J Biomed Inform 2020;109:103516.
3. Usta SN, Uğur-Aydın Z, Demirkaya K, Aydın C. Contemporary research trends on nanoparticles in endodontics: a bibliometric and scientometric analysis of the top 100 most-cited articles. Restor Dent Endod 2023;48(3):e27.
4. Shamszadeh S, Asgary S, Nosrat A. Regenerative endodontics: a scientometric and bibliometric analysis. J Endod 2019;45(3):272–280.
5. Bentley PJ. Cross-country differences in publishing productivity of academics in research universities. Scientometrics 2015;102(1):865-883.
6. Jaffe K, ter Horst E, Gunn LH, Zambrano JD, Molina G. A network analysis of research productivity by country, discipline, and wealth. PLoS One 2020;15(5):e0232458.
7. Abramo G, D'Angelo CA, Soldatenkova A. The ratio of top scientists to the academic staff as an indicator of the competitive strength of universities. J Informetr 2016;10(2):596-605.
8. Ak M, Gülmez A. Türkiye'nin Uluslararası Yayın Performansının Analizi. Akademik İncelemeler 2006;1(1):22-49.
9. Maviş Sevim FÖ. Doktora öğrencileri için hazırlanan araştırma üretkenliğini destekleme programının geliştirilmesi ve değerlendirilmesi [Doktora Tezi]. Tokat Gaziosmanpaşa Üniversitesi; 2018.
10. The Scientific and Technological Research Council of Turkey (TÜBİTAK). UBYT International Scientific Publications Incentive Program Implementation Principles (2016). Available at: https://cabim.ulakbim.gov.tr/wp-content/uploads/sites/4/2017/09/2016-Yılı-UBYT-Programı-Uygulama-Esasları-2.pdf. Accessed: January 1, 2025.
11. Official Gazette of the Republic of Turkey. Regulation on the Promotion of Academic Staff. Published on April 15, 2018. Available at: https://www.resmigazete.gov.tr/eskiler/2018/04/20180415-3.htm. Accessed: January 1, 2025.
12. Official Gazette of the Republic of Turkey. Regulation on the Procedures and Principles Regarding Research, Development and Project Incentives in Higher Education Institutions. Published on June 12, 2018. Available at: https://www.resmigazete.gov.tr/eskiler/2018/06/20180612-6.htm. Accessed: January 1, 2025.
13. Demir SB. Pros and cons of the new financial support policy for Turkish researchers. Scientometrics 2018;116(3):2053-2068.
14. Ullah A, Ameen K. Relating research growth, authorship patterns and publishing outlets: a bibliometric study of LIS articles produced by Pakistani authors. Scientometrics 2021;126(9):8029-8047.
15. Tanveer Awan M, Bhaumik A, Hassan S, Haq IU. A Scopus based bibliometric evaluation of Saudi Medical Journal from 1979 to 2019. Talent Dev Excell 2020;12(2):2328-2337.
16. Bozkurt AS. Bibliometric analysis of the published studies on the kindling model between 1980 and 2023. Eur J Ther 2023;29(2):188-193.
17. Garfield E. Bradford's law and related statistical patterns. Essays of an Information Scientist 1980:476-483.
18. Brookes BC. Bradford's law and the bibliography of science. Nature 1969;224(5223):953-956.
19. Natarajan K, Stein D, Jain S, Elhadad N. An analysis of clinical queries in an electronic health record search utility. Int J Med Inform 2010;79(7):515-522.
20. Arshad AI, Ahmad P, Karobari MI, Asif JA, Alam MK, Mahmood Z, et al. Antibiotics: a bibliometric analysis of top 100 classics. Antibiotics (Basel) 2020;9(5):219.
21. Abraham S, Mehta DL, Bellad SC, Patil S, Kamble AB, Chaudhari S. The contribution of Indian endodontists in rotary endodontics to Pubmed Database, from 2000-2017. Open Access Maced J Med Sci 2018;3;6(10):1878-1881.
22. Alrubaig NA, Haq IU, Alfouzan K, Iyer K, Bijai LK. Research performance of Saudi Arabia in endodontics: a bibliometric analysis. J Int Soc Prev Community Dent 2023;13(2):96-105.