



Turkish Retinoblastoma Research: A Bibliometric Analysis (1966-2024)

Aslan Aykut^{1,2}, Almıla Sarıgül Sezenöz^{1,3}

¹University of Michigan, Kellogg Eye Center, Department of Ophthalmology and Visual Sciences, Michigan, USA

²Marmara University Faculty of Medicine, Department of Ophthalmology, İstanbul, Türkiye

³Başkent University Faculty of Medicine, Department of Ophthalmology, Ankara, Türkiye

Abstract

Objectives: To conduct the first bibliometric analysis of retinoblastoma research in Türkiye and identify leading institutions, authors, collaboration patterns, and potential growth areas.

Materials and Methods: We conducted a search on international databases (Web of Science [WoS] and Scopus), a national database (TR Dizin), and gray literature sources (thesis/Scientific and Technological Research Council of Türkiye project reports). Data were cleaned and analyzed using bibliometric tools, including Open Refine and VOSviewer. Bibliometric indicators such as number of publications, journals, h-index, collaboration patterns, and co-occurrence of keywords were examined.

Results: A search of WoS and Scopus entries published between 1966 and 2024 yielded 122 relevant publications, with articles (n=78, 63.9%) being the most common document type. More than two-thirds of the publications were from 4 institutions: İstanbul University (n=48, 23.8%), Hacettepe University (n=34, 16.8%), Ankara University (n=33, 16.3%), and İstanbul University-Cerrahpaşa (n=22, 10.9%). The total number of citations was 1,148, with an average of 10.16 per publication and an h-index of 16. Excluding 8 internationally collaborated articles, the citations and h-index decreased to 661 and 14, respectively. *Pediatric Blood & Cancer* was the most preferred journal, with 22 publications (19.5%). The national database search yielded 18 publications with 0 citations. Of 29 relevant theses, only 4 (13.8%) were published. The estimated publication growth predicted an increase in publication numbers per year until 2030.

Conclusion: This study represents the first bibliometric analysis of retinoblastoma research conducted in Türkiye. Our findings underscore the concentration of research in a few institutions, the importance of international collaborations, and the potential for growth in particular areas. Addressing these areas strategically can empower Turkish researchers to enhance their contributions to the field and improve patient care.

Keywords: Bibliometrics, retinoblastoma, Türkiye

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Address for Correspondence: Aslan Aykut, University of Michigan, Kellogg Eye Center, Department of Ophthalmology and Visual Sciences, Michigan, USA; Marmara University Faculty of Medicine, Department of Ophthalmology, İstanbul, Türkiye

E-mail: aslanaykut81@gmail.com **ORCID-ID:** orcid.org/0000-0001-5426-1992

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Introduction

Retinoblastoma, the most common intraocular tumor in children, poses significant challenges in diagnosis and treatment due to its unique characteristics and impact on young patients.^{1,2,3} Management of retinoblastoma requires a multidisciplinary approach involving ophthalmologists, pediatric oncologists, and radiologists. Collaborative care coordination is essential to optimize treatment outcomes, minimize side effects, and improve survivors' quality of life.⁴ Understanding the landscape of retinoblastoma research is crucial for advancing knowledge and improving patient outcomes.

Bibliometric analysis offers a powerful tool for evaluating the scientific output of various research components within a field (such as papers, authors, keywords, journals, institutions, and nations). It differs from other forms of research in several aspects. In contrast to meta-analysis, which synthesizes empirical data by analyzing the direction, strength, and relationships of effects, bibliometric studies use quantitative techniques to synthesize the bibliometric capital of a field by examining the relationships between different scientific elements at the intellectual, social, and conceptual levels.^{5,6} Additionally, due to the possibility of interpretation bias by scholars from different backgrounds, bibliometric research provides objectivity that systematic literature reviews may not provide.⁷ However, bibliometric analysis should not be viewed as a replacement for other traditional methods of discussing developments in a field, such as meta-analyses or systematic literature reviews. Rather, they complement the areas where these methods are lacking.⁵ Bibliometric analysis could offer a valuable tool for mapping the retinoblastoma research landscape, enabling researchers to identify trends, patterns, and gaps in the existing literature, which can inform future research directions and ultimately contribute to improved patient care.

The current landscape of bibliometric analysis in Turkish ophthalmology literature appears to be limited. We found few articles presenting Turkish ophthalmologists' contributions to international bibliometric studies, and only one study directly targeted the Turkish context.^{8,9,10,11} This highlights a potential



gap in the use of bibliometric analysis to understand the dynamics of national ophthalmology research. Such analyses could be invaluable to Turkish institutions and researchers, providing insights into publication trends, leading contributors, focus areas, collaboration patterns, and opportunities for strategic growth.

This study aims to address the gap in bibliometric research within the context of Turkish ophthalmology literature, specifically focusing on retinoblastoma. Recognizing the absence of prior comprehensive bibliometric analyses in this domain, we conducted an extensive search encompassing international, national, and gray literature sources across a broad timeframe.

Materials and Methods

International Database Search Strategy

A comprehensive search was conducted on the Web of Science (WoS) Core Collection and Scopus. These databases were chosen for their extensive coverage of peer-reviewed literature across various disciplines and detailed bibliographic data necessary for bibliometric analysis.

Web of Science Search

The search query was formulated as follows: All fields=(retinoblastoma) AND All fields=(Turkey). No language restrictions or time limits were applied to ensure a comprehensive coverage of relevant literature. The search was conducted on March 22, 2024, and the results were exported in a tab-delimited file, including full records and cited references.

Inclusion and Exclusion Criteria

The search results were filtered to include documents that focused solely on retinoblastoma research, had at least one author affiliated with a Turkish institution, and were classified as articles, reviews, editorials, letters, or conference papers.

We omitted documents not related solely to retinoblastoma research, documents without any Turkish-affiliated authors, and documents with Turkish-affiliated authors if the studies were conducted outside of Türkiye.

Two researchers independently screened the search results for eligibility based on the inclusion and exclusion criteria, and discrepancies were resolved by discussion and consensus.

Scopus Search

We also did a Scopus search with the same criteria that we used for WoS.

Data Cleaning and Clustering

The exported data from WoS was preprocessed using Open Refine (version 3.4.1) to ensure data consistency and accuracy. The following steps were performed:

Harmonizing Keywords: Different writing styles, abbreviations, or name changes over time were identified and harmonized to enable precise keyword analysis.

Author Clustering: Open Refine's clustering algorithms were applied to group together different name variations belonging to the same author. This step helped in correctly

attributing publications to individual authors and avoiding author name ambiguity.

Data Analysis

Both WoS and Scopus were used to determine the total number of unique publications. However, the two databases have different indexing systems and rules. Therefore, we chose to use the WoS database, which is the most authoritative database.¹²

Publication years, document types, authors, author affiliations, WoS categories, WoS index, languages, and journal names were recorded using the WoS analyze section. Since most of the data fit into multiple bins within their respective categories, we used the full counting method. As a result, the total percentage of data exceeded 100%.

Although our study mainly focuses on ophthalmology, we also wanted to investigate the research contribution of pediatric oncology clinics to the field of retinoblastoma in Türkiye. To assess this, we specifically searched for articles published solely by pediatric oncology departments without any collaboration with ophthalmology clinics.

As the citation sources of the two databases were different, we used WoS for citation analysis because it contained more articles. To determine the impact of international collaboration, we carried out two analyses, one with and one without international collaboration.

Growth Trends of Publications

Using Microsoft Excel for Microsoft 365, we generated the prediction model $f(x) = ax^3 + bx^2 + cx + d$ to calculate cumulative publications. This allowed us to predict future publication trends and forecast the growth trends of publications in the field. Here, x stands for time (year), and $f(x)$ is the total number of publications per year.¹³

Turkish Database Search

We conducted a search of the TR Index through the website (<https://trdizin.gov.tr/>) using the keyword "retinoblastoma".

Gray Literature Search

National Theses: To identify theses related to retinoblastoma and explore which ones have been published, we searched the Council of Higher Education Thesis Center website (<https://tez.yok.gov.tr/>) using the keywords "retinoblastoma" and "retinoblastom". The results were then cross-referenced with the TR index and other databases (PubMed, WoS) to determine which theses had been published as articles in peer-reviewed journals.

Scientific and Technological Research Council of Türkiye (TÜBİTAK) Projects: We searched the TÜBİTAK project database using the keyword "retinoblastoma" to find relevant projects (<https://app.trdizin.gov.tr/search/projectSearch.xhtml>).

Visual Analysis

Using VOSviewer (version 1.6.20), co-authorship networks with and without international collaborations and keyword co-occurrence maps were generated. The author and keywords with most total link strength were recorded.

Results

Web of Science and Scopus Results

A total of 113 publications were retrieved from the WoS collection. Another 9 publications that were not on the WoS list were identified from the Scopus search. Most of the publications were research articles (n=78, 63.93%), followed by meeting abstracts (n=25, 20.49%), reviews (n=11, 9.00%), letters (n=5, 4.10%), editorial materials (n=2, 1.64%), book chapters (n=2, 1.64%), proceeding papers (n=2, 1.64%), and early access papers (n=1, 0.82%).

Our analysis of the three most common publication types (articles, meeting abstracts, and reviews) in retinoblastoma research in Türkiye revealed varying trends across different decades. From 1990 to 1999, articles dominated (92.3%), with only one meeting abstract (7.7%) and no reviews. The 2000–2009 period saw a slight decrease in articles (71.4%) and an increase in meeting abstracts (23.8%) and reviews (4.8%). The 2010–2019 decade showed a further shift, with articles comprising only 45.0%, while meeting abstracts (32.5%) and reviews (22.5%) increased. Finally, from 2020 to 2024, articles resurged (83.3%), accompanied by a decrease in meeting abstracts (16.7%) and no reviews.

There were 43 different affiliations associated with the publications in the dataset. The most prominent affiliations were Istanbul University with 48 publications (23.76%), Hacettepe University with 34 publications (16.83%), Ankara University with 33 publications (16.34%), and İstanbul University-Cerrahpaşa with 22 publications (10.89%). These four affiliations together accounted for more than two-thirds (67.82%) of the total affiliations in the dataset.

The dataset included publications in three different languages: English, Turkish, and French. English was by far the most dominant language, with 115 publications, accounting for 94.26% of the total. Turkish followed with 6 publications, representing 4.92% of the dataset.

The top 5 most represented WoS categories were ophthalmology with 49 publications (43.36%), oncology with 44 publications (38.93%), pediatrics with 39 publications (34.51%), hematology with 26 publications (23%), and radiology, nuclear medicine, and medical imaging with 5 publications (4.44%). There was only one article (0.82%) that was published solely by a pediatric oncology clinic without any contribution from an ophthalmology department.

The most represented database was the Science Citation Index Expanded-SCIE, with 104 publications accounting for 92.04% of the total. This was followed by the Emerging Sources Citation Index-ESCI with 8 publications (7.08%), the Conference Proceedings Citation Index-Science-CPCI-S with 5 publications (4.43%), and both the Book Citation Index-Science-BKCI-S and Social Sciences Citation Index-SSCI with 1 publication each (0.89%).

The top 10 most represented journals were *Pediatric Blood & Cancer* with 22 articles (19.46%), *European Journal of Ophthalmology* with 6 articles (5.31%), *Journal of Pediatric*

Ophthalmology & Strabismus with 6 articles (5.31%), *Journal of Clinical Oncology* with 5 articles (4.42%), *Turkish Journal of Ophthalmology* with 5 articles (4.42%), *Pediatric Hematology and Oncology* with 4 articles (3.54%), *Japanese Journal of Ophthalmology* with 3 articles (2.65%), *Ophthalmology* with 3 articles (2.65%), *Turkish Journal of Pediatrics* with 3 articles (2.65%), and *British Journal of Ophthalmology* with 2 articles (1.77%).

These top 10 journals collectively published 59 articles, accounting for more than half (52.21%) of the total publications.

Citation Report

Citation analysis of the 113 documents in WoS revealed a total of 1,148 citations, with an average of 10.16 citations per item. The h-index was 16. The 3 most cited and 5 of the 10 most cited articles came from international collaboration. When the 8 documents involving international collaboration were removed, the total number of citations and h-index decreased to 661 and 14, respectively. [Figure 1](#) shows publications and citations over time excluding international collaborated documents. [Table 1](#) shows the top 20 most cited articles excluding international collaborated documents.

Growth Trends Results

Based on the total number of publications over the previous two decades, publication trends for the next 5 years were estimated. The model predicted accelerated growth in publication numbers ([Figure 2](#)).

Turkish Database Results

The total publication number was 18. After removing the publications in the WoS and Scopus to prevent duplication, there were 14 publications between 1995 and 2022. The journal with the most publications was *MN Ophthalmology* with 6 documents, the highest contributing author was Kaan Gündüz (Department of Ophthalmology, Ankara University) with 5 publications, and the most frequent affiliation was Ankara University with 7 documents. The total number of citations was zero.

Thesis Results

A total of 33 theses were evaluated. The department with the highest number of theses was Ankara University, Ophthalmology Department with 9 theses (27.3%). Ophthalmology departments collectively accounted for 20 theses (60.6%). Five theses (15.2%) resulted in publications. Hayyam Kıratlı (Ophthalmology Department, Hacettepe University) was the most productive thesis advisor, supervising 7 theses (21.2%).

TÜBİTAK Project Results

The thesis titled “Polymorphic marker (RELP) analysis in cytogenetics and mutant alleles in retinoblastoma cases”, done in 1995 at Hacettepe University Faculty of Medicine, Department of Medical Biology, was the only relevant project funded by TÜBİTAK.

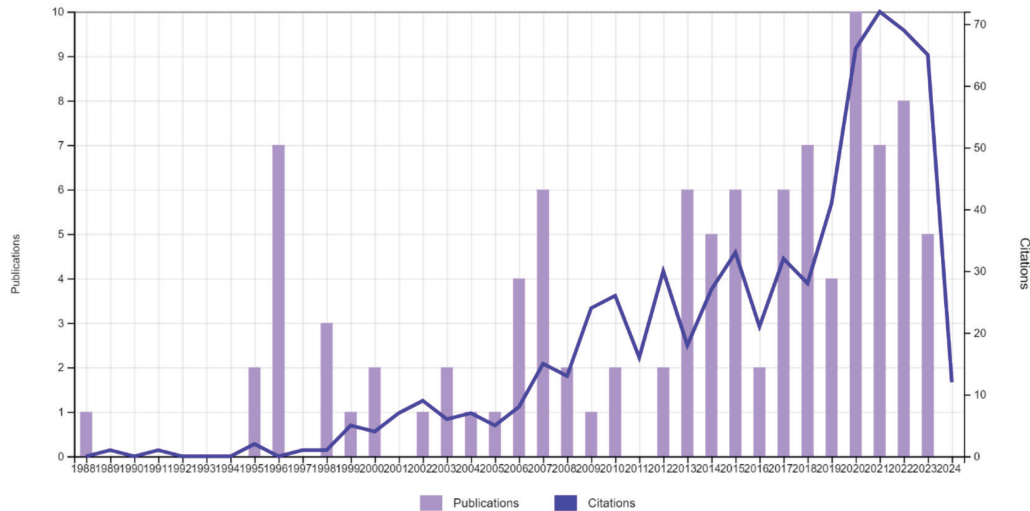


Figure 1. Publications and citations between 1988 and 2024 in WoS. WoS: Web of Science

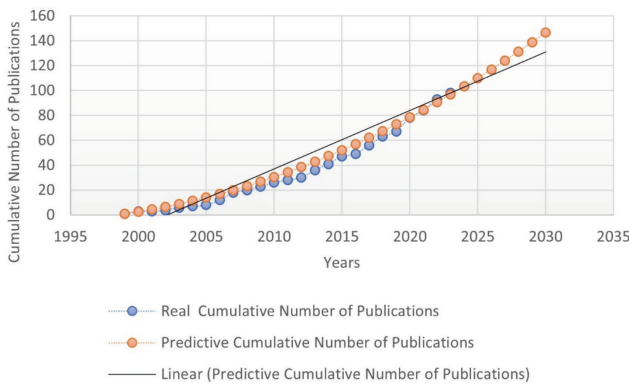


Figure 2. Real and predicted cumulative number of publications in international databases

Author Collaboration Analysis

Figure 3 shows author collaborations with and without international collaborations. Rejin Kebudi (Pediatric Hematology and Oncology Department, İstanbul University) had the highest total link strength.

Keyword Analysis

Figure 4 shows keyword link strength and changes over time. “Chemotherapy” and “management” had the highest link strengths.

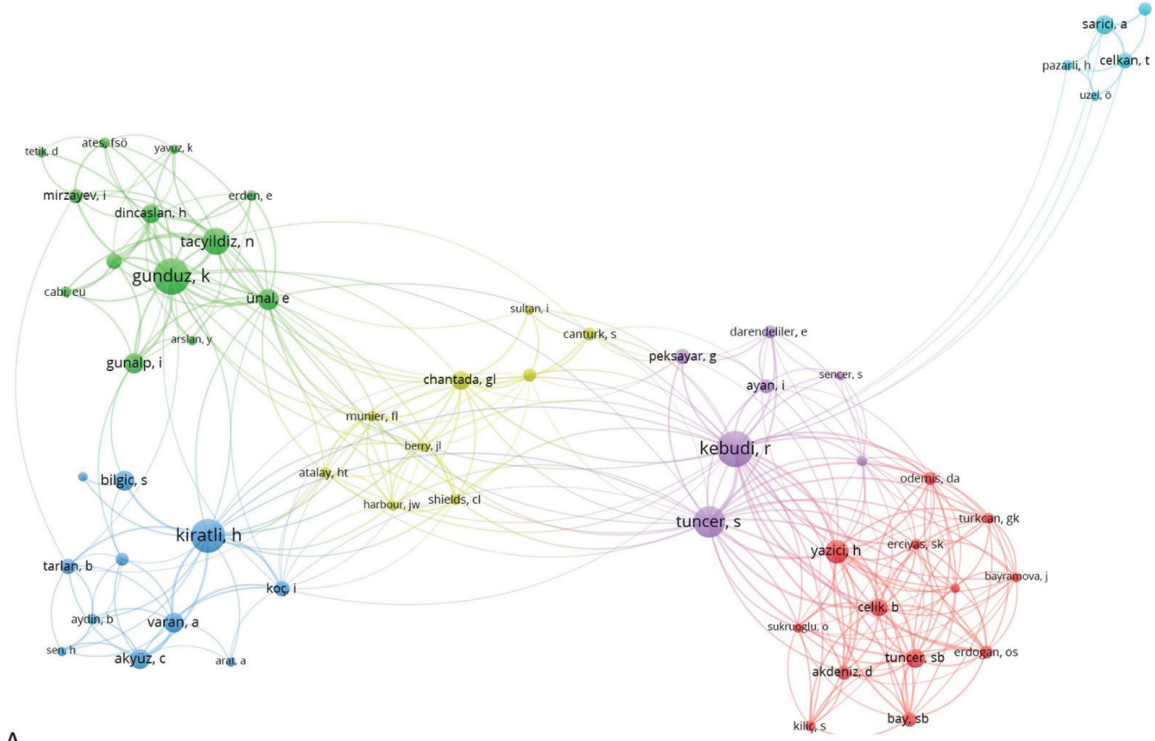
Discussion

Bibliometric studies of ocular oncology are remarkably limited, indicating a possible gap in understanding of the research dynamics in this subspecialty.^{14,15,16} While broader bibliometric analyses in ophthalmology exist, they may not fully capture ocular oncology research.^{17,18}

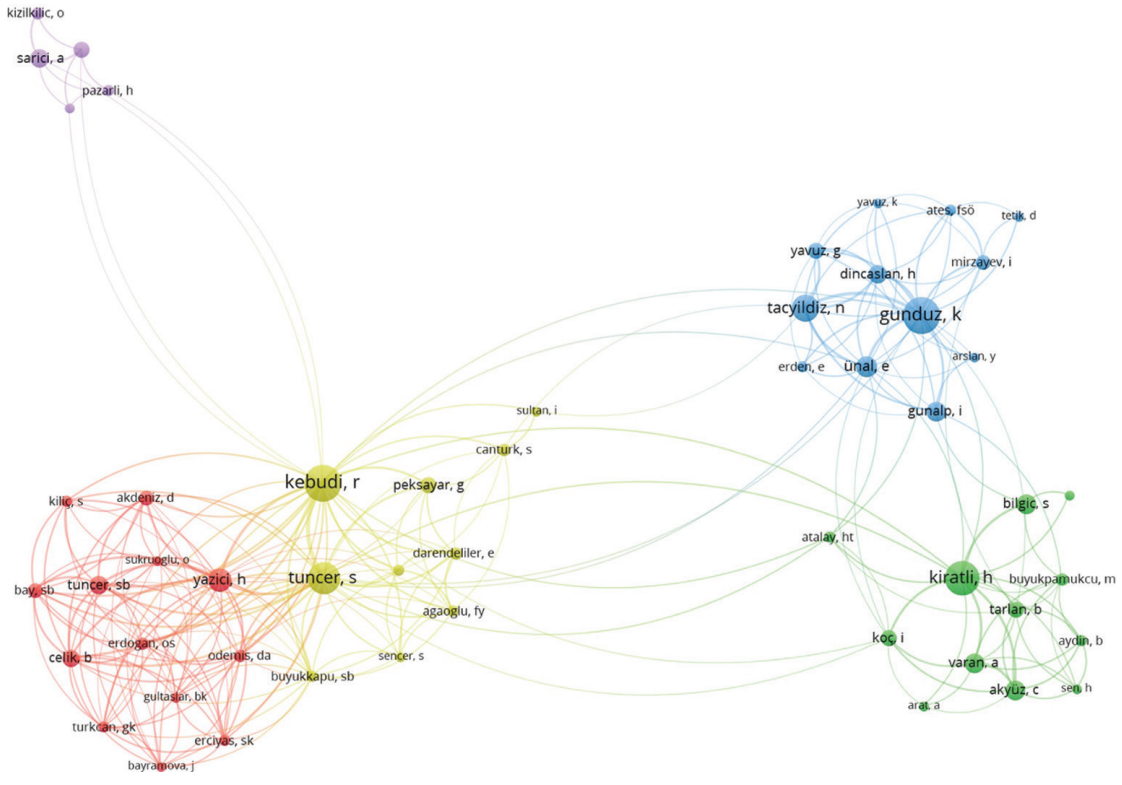
A recent bibliometric study examining global retinoblastoma research from 2001 to 2021 showed that the United States contributed 643 publications (38.4% of global production), received 16,931 citations (56.2% of total citations), and had the highest h-index of 67. Eleven of the 20 most productive institutions (55%) were located in the United States. Of the remaining 9 institutions, 1 was in Canada, 2 were in Argentina, and 1 was in India.¹⁴ While our study highlights the significant contributions made by Turkish researchers and institutions, no Turkish institution ranked among the top 20 institutions according to that study.¹⁴ Retinoblastoma is a very rare disease with an incidence that does not vary by race.¹⁹ It is expected that due to their large populations, countries like the United States and India would have relatively more patients and consequently conduct more research. However, the presence of 3 centers from countries with smaller populations than ours on this list hints that there may be areas where retinoblastoma research can be improved. As our study shows, most of the patients in Türkiye are currently treated in 4 centers.

However, clinical studies alone are not the only focus of retinoblastoma research. For instance, the pathophysiology of retinoblastoma has been the subject of growing research recently, especially in molecular biology and biochemistry.^{20,21} We found that only one of the studies examined in our analysis was classified by WoS in this category. In addition, the retinoblastoma animal model, which is an important part of retinoblastoma translational research, has not been utilized in Turkish studies.²²

The h-index can be used as a metric that captures the contribution and impact of a country’s research on a particular subject.²³ According to the WoS database, the h-index for retinoblastoma research in Türkiye was 16. When compared to the global h-index, Türkiye’s impact on retinoblastoma research is relatively modest.¹⁴ Our study showed that the 3 most cited



A



B

Figure 3. Co-authorship networks in WoS. (A) Including international collaborations. Yellow cluster represents well-known international retinoblastoma researchers. (B) Excluding international collaboration. WoS: Web of Science

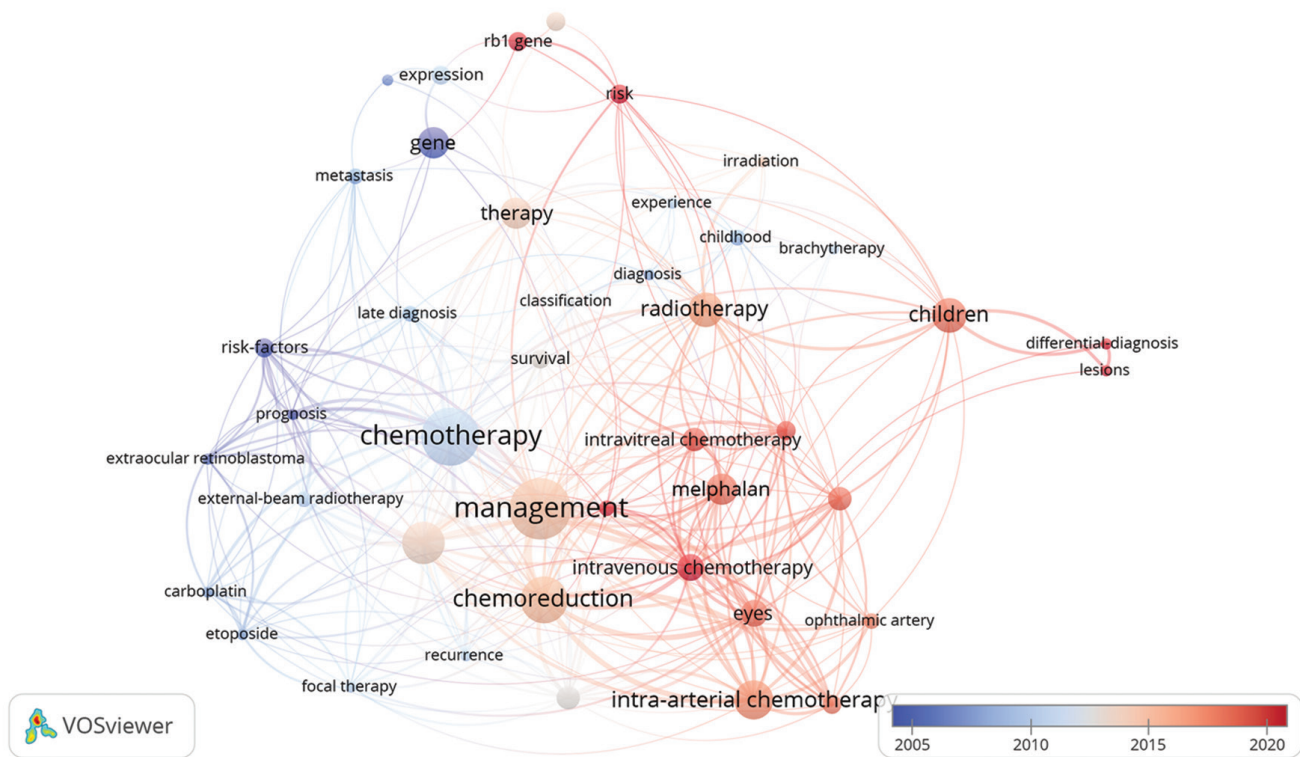


Figure 4. Co-occurrence of keywords and changes over time in WoS. WoS: Web of Science

articles from our data set, all of which involved international partnerships, significantly contributed to Türkiye's h-index of 16, because it dropped to 14 when we removed them. Additionally, when we removed 8 internationally collaborated studies, the number of citations dropped by almost half. Therefore, by fostering partnerships with leading international research groups, Türkiye can further improve its h-index. Furthermore, network visualization offered insights into the collaboration patterns between Turkish and international researchers in retinoblastoma. The yellow cluster in [Figure 3A](#), which represents well-known international retinoblastoma researchers, appears interconnected with three universities through the most productive authors in Türkiye.

When examining the top journals publishing retinoblastoma research from Türkiye, we found both similarities and differences compared to global trends.¹⁴ In our dataset, the most represented journal was *Pediatric Blood & Cancer*, accounting for 19.4% of the total publications. This is consistent with the global data, where *Pediatric Blood & Cancer* ranked third, publishing 3.5% of the papers in the field. However, the *British Journal of Ophthalmology*, which published the most retinoblastoma papers globally (5.0%), was not as prominent in the Turkish dataset, ranking tenth with only 1.7% of the publications. In terms of concentration, the top 10 journals in the Turkish dataset collectively published more than half (52.21%) of the total

publications, indicating a higher concentration compared to the global data, where the top 20 journals accounted for 38.7% of the papers. This suggests that Turkish researchers tend to target a more focused set of journals for their retinoblastoma research.

Our analysis revealed 18 published documents in the national database between years 1995 and 2022. The reason for this could be that collecting sufficient data requires collaboration and often spans several years. Given the effort invested in these studies, researchers naturally want their work to have the greatest possible impact and visibility. Moreover, publishing in international journals enhances the visibility and credibility of Turkish researchers within the global scientific community. Also surprisingly, the total number of citations for the articles in the national database was zero. This lack of citations raises questions about the visibility and impact of research published in national journals and highlights the need for further investigation into the citation practices of Turkish authors.

Gray literature contains documents with potential for publication, therefore it helps to understand some of the research shortcomings in a particular area.²⁴ A study done in Türkiye showed that half of the theses (n=154, 50%) were converted to journal articles.²⁵ However, in our study we found that only 13.8% of retinoblastoma theses resulted in publication. The main reason might be that ophthalmology journals can be more meticulous for retinoblastoma articles,

Table 1. The top 20 most cited articles excluding international collaborated publications

Title	Corresponding author	Journal	Year	Citations	
				Pear year	Total
Metastatic retinoblastoma clinical features, treatment, and prognosis ²⁶	Gündüz, Kaan	<i>Ophthalmology</i>	2006	4.16	79
Causes of chemoreduction failure in retinoblastoma and analysis of associated factors leading to eventual treatment with external beam radiotherapy and enucleation ²⁷	Gündüz, Kaan	<i>Ophthalmology</i>	2018	2.76	58
Chemotherapy in retinoblastoma: current approaches ²	Yankı, Özge	<i>Turkish Journal of Ophthalmology</i>	2015	3.5	35
Superselective intra-arterial chemotherapy in the primary management of advanced intra-ocular retinoblastoma: first 4-year experience from a single institution in Turkey of intra-arterial chemotherapy ²⁸	Tuncer, Samuray	<i>Acta Ophthalmologica</i>	2016	3.67	33
Retinoblastoma in Turkey: survival and clinical characteristics 1981-2004 ²⁹	Özkan, Alp	<i>Pediatrics International</i>	2006	1.7	33
Severe pseudo-preseptal cellulitis following sub-Tenon's carboplatin injection for intraocular retinoblastoma ³⁰	Kıratlı, Hayyam	<i>Journal of AAPOS</i>	2007	1.44	26
A 20-year audit of retinoblastoma treatment outcomes ³¹	Gündüz, Kaan	<i>Eye</i>	2020	4.8	24
Clinical and epidemiological characteristics of retinoblastoma: correlation with prognosis in a Turkish pediatric oncology center ³²	Taçyıldız, Nurdan	<i>Pediatric Hematology and Oncology</i>	2007	1.22	22
Management of massive orbital involvement of intraocular retinoblastoma ³³	Kıratlı, Hayyam	<i>Ophthalmology</i>	1998	0.74	20
Intravitreal chemotherapy in the management of vitreous disease in retinoblastoma ³⁴	Kıratlı, Hayyam	<i>European Journal of Ophthalmology</i>	2017	2.38	19
Retinoblastoma in Turkey: diagnosis and clinical characteristics ³⁵	Güenalp, İlhan	<i>Ophthalmic Genetics</i>	1996	0.66	19
Retinoblastoma in Turkey: results from a tertiary care center in Ankara ³⁶	Gündüz, Kaan	<i>Journal of Pediatric Ophthalmology & Strabismus</i>	2013	1.33	16
Retinoblastoma in Turkey--treatment and prognosis ³⁷	Gündüz, Kaan	<i>Japanese Journal of Ophthalmology</i>	1996	0.55	16
Quantitative analysis of proliferation, apoptosis, and angiogenesis in retinoblastoma and their association with the clinicopathologic parameters ³⁸	Kıratlı, Hayyam	<i>Japanese Journal of Ophthalmology</i>	2003	0.68	15
The treatment of retinoblastoma with four-drug regimen including cisplatin, etoposide, vincristine, and cyclophosphamide ³⁹	Varan, Ali	<i>Pediatric Hematology and Oncology</i>	2012	1.08	14
Clinicopathological parameters and expression of P-glycoprotein and MRP-1 in retinoblastoma ⁴⁰	Kıratlı, Hayyam	<i>Ophthalmic Research</i>	2007	0.72	13
The final diagnosis: retinoblastoma or pseudoretinoblastoma ⁴¹	Gündüz, Kaan	<i>Journal of Pediatric Ophthalmology & Strabismus</i>	2021	3	12
Intravitreal lower-dose (20 µg) melphalan for persistent or recurrent retinoblastoma vitreous seeds ⁴²	Tuncer, Samuray	<i>Ophthalmic Surgery Lasers & Imaging Retina</i>	2015	1.2	12
Intra-arterial chemotherapy for retinoblastoma: a single-center experience ⁴³	Varan, Ali	<i>Ophthalmologica</i>	2015	1.2	12
Blue toe syndrome as a complication of intra-arterial chemotherapy for retinoblastoma ⁴⁴	Sarıcı, Ahmet	<i>JAMA Ophthalmology</i>	2013	1	12

which appeal to a very small portion of their readers. As a solution to the low publication rate of retinoblastoma theses, young researchers may consider publishing their work in a national database. Publishing in national databases provides an opportunity for young researchers to gain experience in the publication process and can help enrich the Turkish scientific literature on retinoblastoma.

As another kind of gray literature, we found only one research project funded by TÜBİTAK back in 1995. Since adequate financial support is essential for conducting high-quality research, trying to benefit more from the opportunities

provided by TÜBİTAK may increase the number of research studies and publications.

The publication growth trend showed that starting from just a few publications in the late 1990s, the cumulative number has consistently grown, indicating a positive trend in retinoblastoma research output in Türkiye. The growth in the real cumulative number of publications appears to have accelerated in recent years, particularly from 2015 onwards. The predictive model also suggests that the curve becomes steeper in the later years, implying that the number of publications added each year is expected to rise in concordance with the global trend.¹⁴

Keyword visualization analysis revealed a shift in treatment focus over time, with a gradual decrease in the prominence of external beam radiotherapy-related keywords from 2005 and a corresponding increase in chemotherapy, particularly intra-arterial chemotherapy keywords towards 2020. This change reflects the adoption of newer therapies in the Turkish retinoblastoma research landscape. However, genetic and biological research-related keywords appear to be less prominent compared to clinical and treatment-related themes. Compared to the global network, the Turkish network appears to be more treatment-focused, while the global network covers a wider range of topics, suggesting potential areas for growth in Turkish retinoblastoma research.¹⁴

In our study, we found only one article published by a pediatric oncology clinic without any contribution from the department of ophthalmology. This disparity may be due to several factors, and without further research, it is difficult to determine which of them has the greatest influence. It could be that retinoblastomas are primarily diagnosed and treated by ophthalmologists, resulting in a higher number of ophthalmology publications. Alternatively, there may be a lack of dedicated pediatric oncology clinics specializing in retinoblastoma, resulting in fewer pure pediatric oncology trials. Another possibility is that the multidisciplinary nature of retinoblastoma treatment promotes collaborative research between the two specialties and reduces the number of publications in individual specialties. In addition, our collaboration analysis revealed that a single researcher, Rejin Kebudi (Department of Pediatric Hematology and Oncology, İstanbul University), and the affiliated clinic predominated in the field of pediatric oncology, which may indicate that there are few pediatric oncology clinics that have significant resources for retinoblastoma research in Türkiye. Further studies are needed to investigate these potential factors and their impact on the research landscape of retinoblastoma in Türkiye.

Study Limitations

Our study has some limitations. Firstly, while we aimed to provide a through overview of retinoblastoma research in Türkiye, our analysis focused primarily on quantitative aspects, such as publication counts, citation impact, and collaboration networks. Qualitative aspects, such as the specific research questions, methodological quality, and clinical implications of individual studies were not explored in depth. Secondly, the comparisons made between Turkish and global retinoblastoma research were based on a single bibliometric study, and a more comprehensive comparison would require additional data sources and analyses.

Conclusion

In conclusion, bibliometric studies are powerful tools for assessing a country's research performance in a specific field, providing valuable insights into past achievements and future directions. This study represents the first comprehensive bibliometric analysis of retinoblastoma research conducted by

Turkish researchers. Our findings highlight the dominance of a few academic centers, the value of international collaborations, and the potential for further growth in areas like basic science and genetics research. The comparison with global trends reveals areas for growth and the importance of international collaboration in enhancing research impact. Our study lays the groundwork for future bibliometric analyses of the Turkish ophthalmology literature.

Ethics

Ethics Committee Approval: This study was deemed exempt by the Kellog Eye Center Institutional Review Board.

Informed Consent: Not necessary.

Authorship Contributions

Concept: A.A., **Design:** A.A., **Data Collection or Processing:** A.A., A.S.S., **Analysis or Interpretation:** A.A., A.S.S., **Literature Search:** A.A., A.S.S., **Writing:** A.A.

Conflict of Interest: No conflict of interest was declared by the authors.

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