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# Bibliometric Analysis of Ophthalmology Publications from Arab Countries between 2012 and 2022

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## Abstract:

**PURPOSE:** The purpose of this study was to conduct a bibliometric analysis of articles published in Ophthalmology Journals from Arab countries from 2012 to 2022.

**METHODS:** This cross-sectional analysis of all original ophthalmology research and review articles published by authors with an affiliation with an institution from Arab countries and indexed in the ISI Web of Science between January 2012 and December 2022.

**RESULTS:** For the years 2012–2022, 4292 articles published in Ophthalmology Journals by authors from Arab-based institutions were identified. A 2.11-fold progressive increase in the number of publications was observed over the last decade with a substantial increase in publication volume during the first 2 years of the COVID-19 pandemic. The countries with the highest number of publications were Egypt (38.51%), Saudi Arabia (35.56%), and the United Arab Emirates (7.88%). According to affiliation, authors from King Khaled Eye Specialist Hospital (KKESH) ( $n = 644$ ) published the highest number of ophthalmology articles, followed by King Saud University ( $n = 585$ ) and Cairo University ( $n = 393$ ).

**CONCLUSION:** Over the last decade, the overall productivity of research in the field of ophthalmology has significantly increased. Majority of the articles in ophthalmology were published by authors from Egypt and Saudi Arabia with KKESH as the most productive institution among Arab nations.

## Keywords:

Bibliometric analysis, ophthalmology, research productivity

## Introduction

The field of biomedical research has grown tremendously over the last few decades.<sup>[1]</sup> While a significant upward trend in publication volume has been observed globally, there have been wide variations in research productivity across different regions and countries due to differences in health-care systems, educational programs, and funding support programs.<sup>[1]</sup> Within the Arab region, political, socioeconomic, and security dynamics have also been found to influence scientific productivity.<sup>[2]</sup>

Based on bibliometric reviews of biomedical articles published between 1988 and 2002 by Tadmouri and Bissar-Tadmouri<sup>[2]</sup> and between 2001 and 2005 by Benamer and Benamer,<sup>[3]</sup> the scientific production of Arab nations was found to be significantly lower compared to other countries in the world. In the field of ophthalmology alone, research productivity from Arab league countries was also found to relatively lag behind.<sup>[4,5]</sup> Using the time frame 1900–2012, research output in ophthalmology from Arab countries (0.96%) represented <1% of the global research productivity in ophthalmology.<sup>[4]</sup> While the aforementioned barriers to research activity and scientific publication likely contribute to this research disparity, it is also important to note that the

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accuracy of prior bibliometric analysis was affected by the lack of inclusion and indexing of many of the journals commonly used for publication by Arab-based authors within the standard databases such as ISI Web of Science, Scopus, and MEDLINE for bibliometric analyses.<sup>[2-5]</sup>

Given the recent indexing of several major regional journals such as the *Middle East African Journal of Ophthalmology* in 2020, *Saudi Journal of Ophthalmology* in 2020, and the *Journal of the Egyptian Ophthalmological Society* in 2021 within the ISI Web of Science database, we sought to re-examine the status of ophthalmology research and provide a more accurate presentation of the geographic trends of research output and scientific productivity in Arab countries. In this study, we evaluated the research output of authors from Arab-based institutions in the field of ophthalmology from 2012 to 2022.

## Methods

This cross-sectional study involved a bibliometric analysis of all original research and review articles published in Ophthalmology Journals by ophthalmologists, optometrists, and researchers working in vision science with an affiliation with an institution from an Arab League nation between January 1, 2012, and December 31, 2022. As the study did not involve the evaluation or management of human participants, ethics committee review and approval were waived by the local institutional review board. This study abided by the Strengthening the Reporting of Observational Studies in Epidemiology reporting guideline for cross-sectional studies.<sup>[6]</sup>

The data were extracted from the ISI Web of Science database last March 28, 2023. Using the advanced search engine of ISI Web of Science, the search was limited to the “ophthalmology” category tag. Using the countries filter, Arab-based scientific articles were identified by restricting the search to the following countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Libya, Mauritania, Morocco, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen. To evaluate the more recent production in the field of ophthalmology, the period of analysis was restricted to articles published over the last decade between January 1, 2012, and December 31, 2022. The analysis was further limited to documents classified as articles, articles in press, and reviews. Letters, correspondences, and replies were excluded from this analysis. No other exclusion criteria for language or other publication parameters were applied. All collected data were imported into Microsoft Excel (Microsoft Corp., Redmond, WA, USA) for analysis. The number of articles was used as the

indicator of quantity for scientific productivity. The countries and institutions were ranked according to the number of articles produced.

## Results

For the years 2012–2022, 4292 articles published in Ophthalmology Journals by authors from Arab-based institutions were identified. The number of publications by Arab authors in journals indexed in ISI Web of Science increased steadily during the early years of this decade. During the first 2 years of the COVID-19 pandemic between 2020 and 2021, the annual output of research articles nearly quadrupled from 169 in 2012 to 621 in 2020 and 645 in 2021. In 2022, the number of publications slightly decreased to 527, which was still substantially higher than prepandemic levels [Figure 1]. Overall, a 2.11-fold increase was observed within this decade.

Figure 2 depicts the global distribution of ophthalmology articles published between 2012 and 2022. Both Egypt and Saudi Arabia ranked within the top 25 countries with the highest number of publications worldwide.

Within the Arab League [Figure 3], the highest number of ophthalmology articles were published from Egypt ( $n = 1653$ , 38.51%). This was followed by Saudi Arabia ( $n = 1526$ , 32.74%), United Arab Emirates ( $n = 338$ , 7.88%), Lebanon ( $n = 299$ , 6.97%), and Tunisia ( $n = 254$ , 5.92%).

According to the institution affiliation within Arab nations [Table 1], King Khaled Eye Specialist Hospital (KKESH) in Saudi Arabia ranked the highest in terms of scientific productivity with 644 articles, followed by the King Saud University in Saudi Arabia with 585 articles and the Cairo University in Egypt with 393 articles.

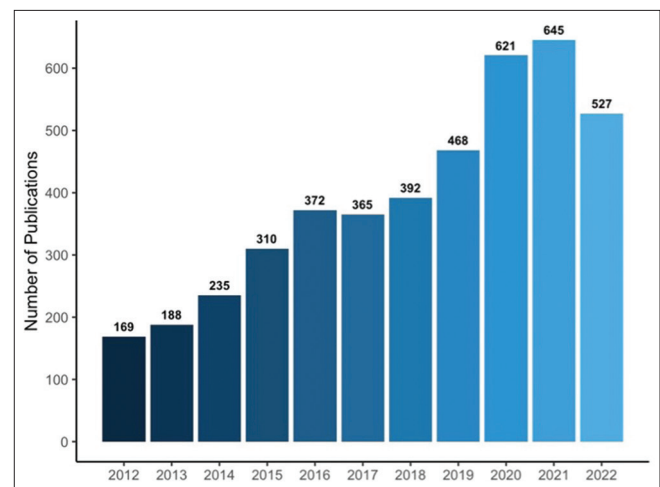


Figure 1: Total annual number of ophthalmology publications from Arab countries between 2012 and 2022

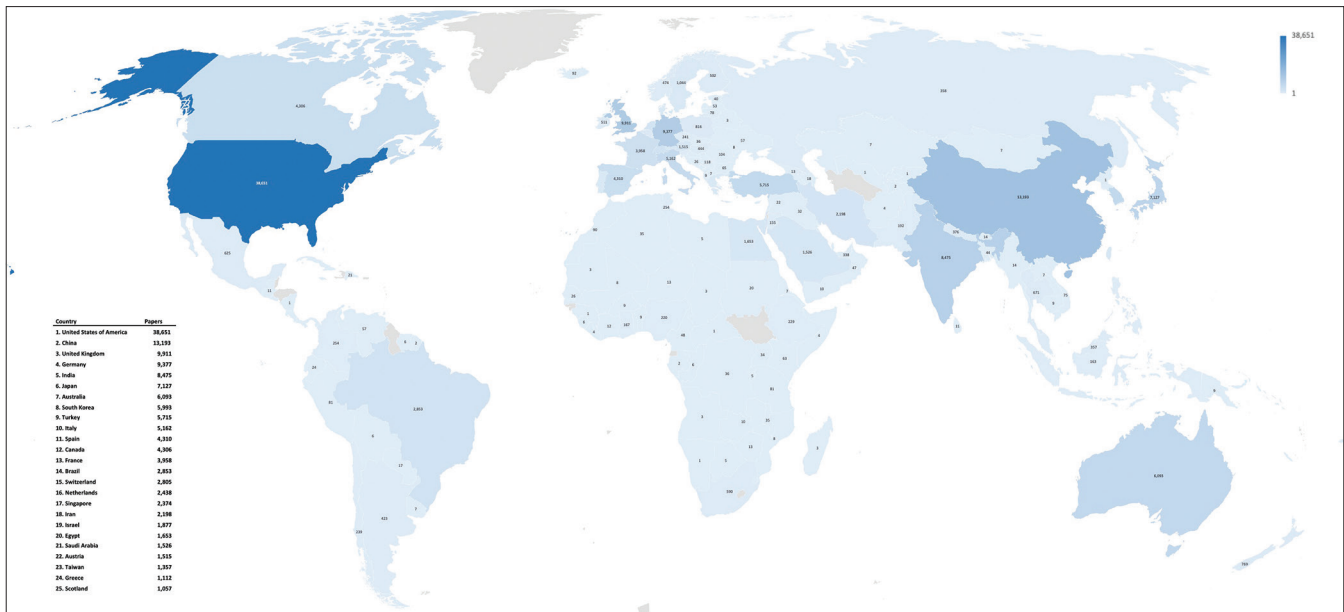


Figure 2: Global distribution of ophthalmology publications between 2012 and 2022

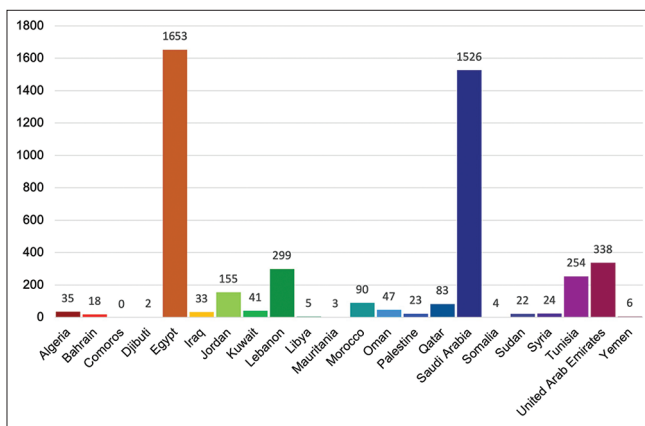


Figure 3: Total number of ophthalmology publications between 2012 and 2022 according to country

In terms of language, the majority of the articles produced were in English ( $n = 4136, 96.37\%$ ) while the rest were in French ( $n = 151, 3.52\%$ ), German ( $n = 3, 0.07\%$ ), and Spanish ( $n = 2, 0.05\%$ ). Table 2 shows the top 25 peer-reviewed journals that were used for publication by Arab-affiliated ophthalmology researchers. *Clinical ophthalmology* (8.11%) was the most commonly used, followed by the *Saudi Journal of Ophthalmology* (5.78%).

## Discussion

Analysis of biomedical research and publications in a country or group of countries is an important tool to monitor progress and trends in research and scientific activity. Research productivity can be quantitatively measured in terms of the number of publications in peer-reviewed journals. While a number of bibliometric analyses in the Arab region have been previously

published by various authors,<sup>[2-5]</sup> recent indexing of major Arab-based Ophthalmology Journals within the ISI World of Science database, as well as the progress toward open research in ophthalmology, has provided the opportunity to comprehensively assess the wider breadth of research and accurately evaluate research productivity within the region.

This bibliometric study of publications of research from Arab nations in the field of ophthalmic and vision research shows that research productivity has substantially increased over the last decade. Notably, a sharp spike in publication volume was observed between 2020 and 2021 during the COVID-19 pandemic. This surge in publications fueled by the COVID-19 pandemic was similarly observed across all biomedical fields.<sup>[7]</sup> Although the total number of publications in 2022 ( $n = 645$ ) had decreased compared to 2021 ( $n = 527$ ), the annual volume in 2022 is substantially higher than pre-pandemic levels. Overall, a 2-fold overall increase in research productivity was observed over the last decade. This trend in research productivity follows the exponential growth in publications not only in the field of ophthalmology but in biomedical research in general.<sup>[1-3]</sup>

Several studies have discussed the factors that have led to the relative paucity of biomedical publications in the Arab region.<sup>[1-3]</sup> While the current analysis finds that both Egypt (top 20) and Saudi Arabia (top 21) have now ranked among the top 25 countries worldwide in terms of the number of ophthalmology publications in the last decade [Figure 2], the rest of Arab nations still lag behind in terms of research productivity. In fact, a close review of the relative contributions of different countries in the

**Table 1: Top ten Arab institutions in ophthalmology research ranked according to number of publications produced from 2012 to 2022**

Rank	Affiliation	Country	Publications
1	KKESH	Saudi Arabia	644
2	King Saud University	Saudi Arabia	585
3	Cairo University	Egypt	393
4	Alexandria University	Egypt	250
5	American University of Beirut	Lebanon	209
6	Ain Shams University	Egypt	204
7	General Organization of Teaching Hospital Institutes	Egypt	192
8	King Abdul Aziz University	Saudi Arabia	185
9	Research Institute of Ophthalmology	Egypt	183
10	Tanta University	Egypt	168

KKESH: King Khaled Eye Specialist Hospital

**Table 2: Top journals for Arab-affiliated ophthalmology researchers from 2012 to 2022**

Rank	Journal	Publications
1	<i>Clinical Ophthalmology</i>	348
2	<i>Saudi Journal of Ophthalmology</i>	248
3	<i>Journal Francais D'Ophthalmologie</i>	199
4	<i>Middle East African Journal of Ophthalmology</i>	179
5	<i>Journal of Ophthalmology</i>	173
6	<i>International Ophthalmology</i>	169
7	<i>European Journal of Ophthalmology</i>	161
8	<i>British Journal of Ophthalmology</i>	136
9	<i>Ocular Immunology and Inflammation</i>	114
10	<i>International Journal of Ophthalmology</i>	110
11	<i>Retina the Journal of Retinal and Vitreous Disease</i>	104
12	<i>BMC Ophthalmology</i>	100
13	<i>Journal of the Egyptian Ophthalmological Society</i>	97
14	<i>Ophthalmic Genetics</i>	97
15	<i>Cornea</i>	90
16	<i>Eye</i>	90
17	<i>Journal of AAPOS</i>	87
18	<i>Investigative Ophthalmology Visual Science</i>	85
19	<i>Acta Ophthalmologica</i>	82
20	<i>Indian Journal of Ophthalmology</i>	72
21	<i>American Journal of Ophthalmology</i>	68
22	<i>Journal of Glaucoma</i>	66
23	<i>Journal of Cataract and Refractive Surgery</i>	63
24	<i>Ophthalmology</i>	60
25	<i>Graefe's Archive for Clinical and Experimental Ophthalmology</i>	54

Arab region to the total number of publications in the field of ophthalmology showed that three-quarters of the total production in the last decade was contributed by authors from only three countries including Egypt (39%), Saudi Arabia (33%), and the United Arab Emirates (8%). Conversely, low-income Arab states such as Comoros, Djibouti, Mauritania, and Somalia produced the least number of publications in ophthalmology research in the studied period. Moreover, countries affected by wars and internal conflicts including Iraq, Libya, Palestine, Somalia, Sudan, Syria, and Yemen have also fared relatively poorly in terms of research output. These findings are fairly consistent with the results of previous studies.<sup>[4,5]</sup>

While scientific publications are broadly recognized as the primary indicator of research productivity, certain studies have indicated that raw counts should be normalized to indicators such as population size to provide a more accurate presentation of the status within each country.<sup>[5]</sup> When the number of publications is adjusted to each by the population size in 2022,<sup>[8]</sup> Lebanon ranked first with 54 ophthalmic publications per million population, followed by Saudi Arabia with 42 publications per million population and the United Arab Emirates with 35 publications per million within the studied time frame. Saudi Arabia, Egypt, Lebanon, and the United Arab Emirates can, therefore, be considered the leading institutions for ophthalmic research in the Arab League.

In terms of individual research institutions, seven of the top ten performers were university-based centers while the rest were hospital-based research centers. In contrast to a previous bibliometric analysis of ophthalmic publications, KKESH has currently outperformed other institutions with the highest productivity in ophthalmic research within the Arab region. Established in 1983, KKESH is one of the largest specialty eye hospitals in the world with a dedicated budget to support research-related activities. The current position of KKESH among other university-based research centers reflects how the allocation of research funds to academic settings outside the university setting can further promote ophthalmology research and increase overall scientific productivity.

This study should also be viewed in the light of some limitations. First, in an effort to avoid count errors related to entry duplicates, ISI Web of Science was the only database used to identify the publications for analysis. Articles published in journals that have contributed to scientific productivity but were not indexed by the ISI Web of Science at the time of analysis were not considered. Second, while no search restrictions were applied to the type of article authors, the articles were identified under the “ophthalmology” category tag which excluded articles in basic science and general internal medicine journals. While this may have resulted in an underestimation of total output, the 116 Ophthalmology Journals included in this analysis represent the most important journals in the field of ophthalmology within the Arab region and internationally.

### Conclusion

Over the last decade, the overall productivity of research in the field of ophthalmology has significantly increased.

The majority of the articles were published by authors from Egypt and Saudi Arabia with KKESH as the most prolific institution among Arab nations within the studied time frame.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Waast R, Rossi PL. Scientific production in Arab countries. *Sci Technol Soc* 2010;15:339-70.
2. Tadmouri GO, Bissar-Tadmouri N. Biomedical publications in an unstable region: The Arab world, 1988-2002. *Lancet* 2003;362:1766.
3. Benamer HT, Bakoush O. Arab nations lagging behind other Middle Eastern countries in biomedical research: A comparative study. *BMC Med Res Methodol* 2009;9:26.
4. Sweileh WM, Al-Jabi SW, Shanti YI, Sawalha AF, Zyoud SH. Contribution of Arab researchers to ophthalmology: A bibliometric and comparative analysis. *Springerplus* 2015;4:42.
5. Alshahrani S, Al Owaifeer AM. Ophthalmology research trends in Saudi Arabia: A four-decade bibliometric analysis. *Cureus* 2020;12:e11465.
6. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, *et al.* The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Lancet* 2007;370:1453-7.
7. Teixeira da Silva JA, Tsigaris P, Erfanmanesh M. Publishing volumes in major databases related to COVID-19. *Scientometrics* 2021;126:831-42.
8. United Nations. Revision of World Population Prospects; 2022. Available from: <https://population.un.org/wpp/>. [Last retrieved on 2023 May 07].