

Analyzing Turkey's Impact on Orthopedic Literature: A Bibliometric Study

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ABSTRACT

Purpose: Bibliometric analyzes are an important tool for evaluating the progress of scientific research, determining research strategies, and using resources effectively. In our study, bibliometric analysis of publications related to orthopedics in Turkey was made.

Methods: In the field of orthopedics, publications between 1980 and 2022 in SCIE journals were scanned. During this screening only articles as document type were included in the study. The distribution of articles by years, the most frequently published topics, the authors who contributed the most, the journals in which they were published, the educational institutions to which the articles belonged, the status of Open Access and citations of the articles were noted.

Results: Between 1980-2022, 274.902 articles were reached. USA takes the first place in the articles published in the world literature. Türkiye is in the 14th place. When we look at the number of contributions to the articles, Murat Bozkurt takes the first place. Looking at the institutions of the authors, the most publications were produced in Hacettepe University. The citation rate per article was found to be 10.56.

Conclusion: In our study, Turkey has entered a rising trend in terms of contributing to science by writing articles in the field of orthopedics. Improvements to be made in health policies in Turkey, increasing the budgets allocated to scientific research and attempts to increase the quality of health institutions will cause Turkey's rapid rise in the scientific arena.

Keywords: Bibliometric, article, citation, Turkey

Türkiye'nin Ortopedi Literatürüne Katkısının İncelenmesi: Bibliyometrik Analiz

ÖZET

Giriş: Bibliyometrik analizler, bilimsel araştırmaların ilerleyişini değerlendirmek, araştırma stratejilerini belirlemek ve kaynakları etkin kullanmak için önemli bir araçtır. Çalışmamızda Türkiye'de ortopedi ile ilgili yayınların bibliyometrik analizi yapılmıştır.

Materyal ve Metod: Ortopedi alanında SCIE dergilerde 1980 ile 2022 yılları arasındaki yayınlar tarandı. Bu tarama sırasında sadece doküman türü olarak araştırma makaleleri çalışmaya dahil edilmiştir. Makalelerin yıllara göre dağılımı, en sık yayınlanan konuları, en çok katkıda bulunan yazarları, hangi dergilerde yayınlandığı, makalelerin ait olduğu eğitim kurumları, açık erişim durumu ve makalelerin atıfları değerlendirildi.

Sonuçlar: 1980-2022 yılları arasında 274.902 makaleye ulaşılmıştır. Dünya literatüründe yayınlanan makalelerde ilk sırayı ABD almaktadır. Türkiye 14. sırada. Yazılara katkı sayısına baktığımızda ilk sırayı Murat Bozkurt alıyor. Yazarların kurumlarına bakıldığında en çok yayını Hacettepe Üniversitesi'nde yapılmıştır. Makale başına atıf oranı ise 10.56 olarak bulundu.

Tartışma: Çalışmamızda Türkiye ortopedi alanında makaleler yazarak bilime katkı sağlama açısından yükselen bir trend içerisine girmiştir. Türkiye'de sağlık politikalarında yapılacak iyileştirmeler, bilimsel araştırmalara ayrılan bütçelerin artırılması ve sağlık kurumlarının kalitesinin yükseltilmesine yönelik girişimler, Türkiye'nin bilimsel arenada hızla yükselmesine neden olacaktır.

Anahtar Kelimeler: Bibliyometrik, makale, atıf, Türkiye

The bibliometric study studies bibliographic data using numerical and statistical analysis of published scientific articles, books, and other publications. This type of study is used to measure research trends in a particular discipline, the quality and impact of published articles, the publication performance of authors and institutions, and other bibliographic characteristics. Bibliometric analysis can include many different data items. Still, data such as publication type, publication year, number of authors, number of citations, journal name, publisher, citations, and collaborations between authors are usually examined. These analyses show the progress of research on a particular topic, the exploration of new areas, and potential opportunities for future research. While bibliometric studies help advance research and make new discoveries in the academic world, they can also increase competition between researchers and institutions.

Bibliometric studies can also measure a country's contribution to the world literature in any branch area. The number of bibliometric studies from Turkey is very limited in the literature. In our study, it is planned to investigate the contribution of orthopedic publications in Turkey to the world literature and to discuss them in the light of the literature.

Material and Methods

Ethics committee approval is not required as no human or animal research exists. The study is a bibliometric analysis research; participant informed consent is not required. The Clarivate Web of Science database searched publications between 1980 and 2022 in SCIE journals in orthopedics. The search process was made on 20.05.2023. During this screening, publications such as letters to the editor, reviews, and book chapters were excluded from the study and only articles as document type were included. Only English was chosen as the language. Each country's publications per million (PmP) values were found as previously described in the literature (1). Population data is taken from <https://datatopics.worldbank.org/>.

While the number of articles belonging to Turkey was found, only the articles sent from Turkey were included; publications made jointly with different centers or countries abroad were not considered. In addition, the distribution of articles by years, the most frequently published topics, the authors who contributed the most, the journals in which they were published, the educational institutions to which the articles belong, the status of Open Access, and the citations of the articles were noted. The citation

data received by the articles are based on the data up to 20.05.2023 when the search process was made.

Results

Between 1980-2022; 274,902 articles were reached all over the world. Distribution of these articles by country, PmP data are given in Table-1 (data for the first 20 countries are given). The distribution of articles by year in Turkey is given in Figure-1. Considering the distribution of the articles in Turkey, 387 articles are related to the ankle, 365 shoulder, and 345 intervertebral disc. Regarding the number of contributions to the articles, Murat Bozkurt contributed 87, Izge Gunal 82, and Abdulhamit Mısır 65 articles. Considering the authors' institutions, most authors are from Hacettepe University, 9 Eylül University is the 2nd, and Gazi University is the 3rd (table-2). Looking at the journals in which articles are published in Turkey, Acta Orthopaedica Et Traumatologica Turcica Ranks First, Journal Of Back And Musculoskeletal Rehabilitation comes in second place, and Archives Of Orthopaedic And Trauma Surgery ranks third. (Table-3). The open-access status of the articles is given in Table-4. 5826 articles have been cited 61,529 times (57.605 without self-citations). The citation rate per article is 10.56. The top 10 most cited articles are given in Table-5, and the comparison of cited publications is given in figure-1.

Countries/Regions	Record Count	Population (million)	PmP
USA	114688	331,9	345
ENGLAND	20855	55,9	373
JAPAN	18687	125,7	148
PEOPLES R CHINA	15527	1412	10
GERMANY	14264	83,2	171
CANADA	12863	38,2	336
AUSTRALIA	8994	25,6	351
SOUTH KOREA	8812	51,7	170
FRANCE	8592	67,7	126
NETHERLANDS	7948	17,5	454
SWITZERLAND	7527	8,7	865
SWEDEN	7368	10,4	708
ITALY	6618	59,1	111
TURKEY	6514	84,7	76
SPAIN	4172	47,4	88
DENMARK	3851	5,8	663
BRAZIL	3778	214,3	17
INDIA	3692	1408	2
BELGIUM	3436	11,5	298
AUSTRIA	3341	8,9	375
WORLD	274.902	7888	34

Affiliations	Record Count	% of 5.826
ISTANBUL UNIVERSITY	508	8.720
HACETTEPE UNIVERSITY	474	8.136
DOKUZ EYLUL UNIVERSITY	282	4.840
GAZI UNIVERSITY	250	4.291
ANKARA UNIVERSITY	246	4.222
UNIVERSITY OF HEALTH SCIENCES TURKEY	243	4.171
ANKARA NUMUNE TRAINING RESEARCH HOSPITAL	222	3.811
BASKENT UNIVERSITY	215	3.690
MARMARA UNIVERSITY	205	3.519
BALTALIMANI BONE DISEASES TRAINING RESEARCH HOSPITAL	194	3.330

Showing 10 out of 1.467 entries

7 record(s) (0.120%) do not contain data in the field being analyzed

Publication Titles	Record Count	% of 5.826
ACTA ORTHOPAEDICA ET TRAUMATOLOGICA TURCICA	829	14.229
JOURNAL OF BACK AND MUSCULOSKELETAL REHABILITATION	382	6.557
ARCHIVES OF ORTHOPAEDIC AND TRAUMA SURGERY	296	5.081
EKLEM HASTALIKLARI VE CERRAHISI JOINT DISEASES AND RELATED SURGERY	266	4.566
KNEE SURGERY SPORTS TRAUMATOLOGY ARTHROSCOPY	252	4.325
JOINT DISEASES AND RELATED SURGERY	236	4.051
INJURY INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED	172	2.952
ACTA ORTHOPAEDICA BELGICA	169	2.901
SPINE	165	2.832
JOURNAL OF PEDIATRIC ORTHOPAEDICS PART B	159	2.729

Showing 10 out of 93 entries

Open Access	Record Count	% of 5.826
All Open Access	1981	34.003
Gold	1445	24.803
Gold-Hybrid	17	0.292
Free to Read	153	2.626
Green Published	1103	18.932
Green Accepted	3	0.051
Green Submitted	353	6.059

3.845 record(s) (65.997%) do not contain data in the field being analyzed

	Before 2020	2020	2021	2022	2023	Average per Year	Total
Article-1 (2)	156	27	34	19	3	11.95	239
Article-2 (3)	150	15	18	23	6	11.16	212
Article-3 (4)	171	12	11	10	4	9.04	208
Article-4 (5)	159	41	43	43	7	29	203
Article-5 (6)	150	13	12	5	0	9	180
Article-6 (7)	109	21	20	14	1	10.31	165
Article-7 (8)	7	26	62	61	6	27	162
Article-8 (9)	101	20	23	10	6	14.55	160
Article-9 (10)	131	5	7	10	1	7.7	154
Article-10 (11)	135	5	11	3	1	7	154

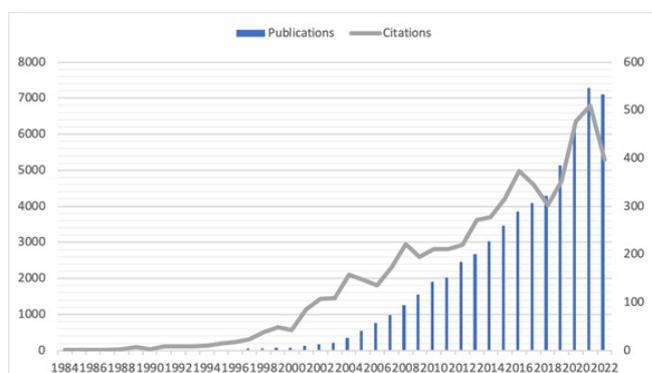


Figure-1. Distribution of publication and citation by years

Discussion

Bibliometric studies of the country where the study was conducted; It provides important data in researching its contribution to the world literature in any branch area. When we look at the top 20 countries with the highest number of publications in the world, we see that Turkey ranks 14th in the field of orthopedics. If we make a comparison according to PMP data, we see that Turkey has regressed from 14th to 17th among 20 countries. When we look at the publications made in our country over the years, while 234 publications were made between 1984-2000, 302 publications were made in the first 3 years (2000-2001-2002), which increased gradually. According to the World Bank data, while the population of Turkey was 64 million in 2000, it was recorded as 85 million in 2022. Here, we see a serious increase in publications per capita. We think there are many reasons for the rapid increase in the number of publications in Turkey since 2000. The widespread use of the internet due to the advancement of technology, the increase in the number of educational institutions in Turkey and Turkey's competitive attitude toward contributing to science are some of the biggest reasons for this increase. Switzerland, Sweden and Denmark constitute the first 3 countries in PMP data. Some common features of these 3 countries are their high educational standards, the wealth of research and development program funds, and the high cooperation between scientists and research institutions.

When we look at the subject distribution of the articles written in Turkey, ankle, shooulder and intervertebral disc constitute the first 3 rows. However, in the last 5 years, there has been a significant increase in the number of studies in the field of Total arthroplasty. Due to the prolongation of the average life expectancy in the world, the increase in the elderly population and the increase in socio-cultural activities in these individuals, studies have focused on joint arthrosis, which reduces the activities of daily living. When the articles written during the research period are examined, total arthroplasty is the first in the world, the intervertebral disc is the second, and the Anterior Cruciate Ligament is the third. In parallel with our explanation above, health issues related to total arthroplasty and intervertebral disc are some of the most common medical conditions we encounter worldwide due to prolonging life expectancy.

Let's look at the top 5 institutions that have written the most articles in our country's orthopaedics field. These are Istanbul University, Hacettepe University, 9 Eylül

University, Gazi University and Ankara University. These 5 institutions constitute approximately 30% of the publications made by Turkey. Located in Turkey's 3 most crowded cities, these universities are some of the oldest universities in Turkey. We think that the presence of qualified academic staff, research-oriented working principles and the existence of sufficient resources-infrastructure are some of the most important factors in contributing to science. When looking at individual publication production, the first 3 researchers are Murat Bozkurt, İzge Günal and Abdulhamit Bozkurt.

In the academic community, success criteria may differ according to disciplines. There are metrics such as the impact factor of the journal, the h index that measures the impact of a researcher's publications, and the number of citations. The number of citations of the published article by other researchers is an important criterion that shows the impact and importance of the article. Citation count is a measure of how influential an article is in the scientific community. If we look at the citation numbers of the studies in Turkey, an increase has been observed in the number of citations in parallel with the number of publications since the early 2000s. However, there has been a decrease in the total number of citations of publications in our country between 2016 and 2018. Despite the regular increase in the number of publications in our country, there may be some reasons for the decrease in the number of citations in the years we mentioned. There is intense competition and publication pressure in the field of medicine and orthopedics. High publication pressure may encourage researchers to publish their results quickly or to publish frequently. This may sometimes lead to reduced research quality or insufficient evaluation of studies. In addition, the fact that scientific literature is freely accessible to readers also affects the citation rate of a publication.

The publication patterns of the articles are a factor that directly affects the reach of the readers. The term Open Access means that scientific literature is freely available to everyone. Open-access publications refer to journals in which articles are published online for free and that anyone can read. In this model, there is no charge for accessing articles, and they are usually published under Creative Commons licenses. In addition, Green publish refers to uploading an author's sample or pre-publish version (preprint or postprint) of articles published in academic journals to an open-access repository (for example, an institutional repository or interdisciplinary repository). This way, articles are published in the journal and available in open-access archives. In this model, the full text of

the article is generally not freely available in the journal but is available in the open-access archive. Green Publish allows articles to be shared and discussed earlier, but full-text access depends on the journal. On the other hand, open access targets full-text access and ensures that articles are freely available from publication. When we look at the publications published in the field of orthopedics in our country, the rate of all open Access is 34%. In the same time period, the world average is 25%, and the USA average is 19%.

There are some limitations of our study. There are some common points of bibliometric studies using web of science database. It is not possible to evaluate the publications before 1980. In addition, cross-examination with support from Pubmed, Scopus and other search engines will increase the reliability of the data. It is not appropriate to evaluate a country's contribution to science only through studies published in a single index. If you give an example for Turkey, articles published in TRdizin-indexed journals are not included in our study. The reason for this is that we think that making comparisons with the world literature will not give accurate results. The impact factor of journals is a separate study. There is no direct relationship between the impact factor and the journal's quality (12).

Conclusion

As a result, this analysis mentioned how the studies in the field of orthopedics in Turkey took place in the world literature. The increase in the number of publications and total citations started in the early 2000s; The improvement of health policies will be accelerated with the addition of additional institutions that will provide financial support to institutions such as TOTBID and Tübitak. Thus, our country's contribution to world science will increase.

Declarations

Funding

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Conflicts of Interest/Competing Interests

The authors declare that they have no competing interests.

Ethics Approval

Ethics committee approval is not required for this study.

Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Authors' Contributions

All authors contributed to this work in accordance with the ICMJE authorship criteria. Conceptualization: AK. Data collection: İU. Data analysis: İU. Draft: AK. Review and editing: İU. All authors read and approved the final manuscript.

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