Received: 14 June 2023 | **Accepted:** 23 Oct 2023 **Genel Tıp Derg. Volume** 33/**Issue** 6 (December), 732-738
DOI: 10.54005/geneltip.1314322

ORIGINAL ARTICLE

Bibliometric and Visual Analysis of Elbow Tendinosis Research in Orthopaedic Surgery

Ortopedik Cerrahide Dirsek Tendinozu Araştırmalarının Bibliyometrik ve Görsel Analizi

[1]Alaaddin Oktar Üzümcügil

[1]Department of Orthopedics and Traumatology, Kütahya Health Sciences University Faculty of Medicine, Kütahya, Türkiye

Correspondence

Alaaddin Oktar Üzümcügil, Kütahya Health Sciences University - Evliya Çelebi Campus,, Department of Orthopedics and Traumatology, Kütahya, Türkiye.

E-Mail: alaaddinoktar.uzumcugil@ksbu.edu.tr

How to cite ?

Üzümcügil A. Bibliometric and Visual Analysis of Elbow Tendinosis Research in Orthopaedic Surgery. Genel Tıp Derg. 2023;33(6):732-8.

ABSTRACT

Aim: Elbow tendinosis is the most frequent cause of elbow discomfort. The disease is common in the daily routine practice of sports medicine and orthopedics. However, currently, this issue lacks a multifaceted, methodical and understandable visual examination.
Materials and Methods: Utilizing the Biblioshiny program, the core collection dataset of the Web of Science database's literature on elbow tendinosis from January 1970 to April 2023 was compiled and examined. Research hotspots and development patterns were examined in terms of highly influential authors, research institutions, nations or regions, keywords and referenced publications.
Results: According to the search criteria, 526 articles were published by 1817 authors from 839 affiliations, and 47 countries in the Web of Science database. The number of articles on elbow tendinosis has increased over time, especially after 2000. 55.6% of all articles were published in 2010 and subsequent years. The articles included in this study were published in the United States (n=152, 28.84%), England (n=43, 8.16%), Germany (n=40, 7.59%), Türkiye (n= 40, 7.59%) and South Korea (n=28, 5.31%). The United States had the highest total citation number (4493), but Canadian publications had the highest number of average article citations (56.4).
Conclusion: Although studies on elbow tendinosis in the field of orthopedics have gained momentum in recent years, they are still insufficient. Although the United States ranks first in terms of publications, it is pleasing for our country that Türkiye ranks high.

Keywords: Bibliometric analysis; elbow tendinosis; tennis elbow; visual analysis

ÖZ

Amaç: Dirsek tendinozisi dirsek rahatsızlığının en sık nedenidir. Hastalık, spor hekimliği ve ortopedinin günlük rutin uygulamalarında yaygındır. Ancak günümüzde bu konuda çok yönlü, metodolojik ve anlaşılabilir bir görsel inceleme bulunmamaktadır.
Gereç ve Yöntemler: Biblioshiny programı kullanılarak, Web of Science veri tabanının 1970'ten Nisan 2023'e kadar dirsek tendinozu ile ilgili literatürünün çekirdek koleksiyon veri seti derlendi ve incelendi. Araştırma noktaları ve gelişim modelleri, yüksek etkiye sahip yazarlar, araştırma kurumları, uluslar veya bölgeler, anahtar kelimeler ve atıfta bulunulan yayınlar açısından incelenmiştir.
Bulgular: Arama kriterlerine göre, Web of Science veri tabanında 839 kuruluştan ve 47 ülkeden 1817 yazar tarafından 526 makale yayınlanmıştır. Dirsek tendinozu ile ilgili makalelerin miktarı zaman içinde, özellikle 2000 yılından sonra artmıştır. Tüm makalelerin %55,6'sı 2010 ve sonraki yıllarda yayımlanmıştır. Bu çalışmaya dahil edilen makaleler Amerika Birleşik Devletleri (n=152, %28.84), İngiltere (n=43, %8.16), Almanya (n=40, %7.59), Türkiye (n=40, %7.59) ve Güney Kore'de (n=28, %5.31) yayınlanmıştır. En yüksek toplam atıf sayısı 4493 ile Amerika Birleşik Devletleri'ne aittir, ancak Kanada yayınları en yüksek ortalama makale atıf sayısına (56,4) sahiptir.
Sonuçlar: Ortopedi alanında dirsek tendinozu ile ilgili çalışmalar son yıllarda ivme kazanmış olsa da hala yetersizdir. Yayınlar açısından Amerika Birleşik Devletleri ilk sırada yer alsa da Türkiye'nin üst sıralarda yer alması ülkemiz adına sevindiricidir.

Anahtar Kelimeler: bibliyometrik analiz; dirsek tendinozu; tenisçi dirseği; görsel analiz

Introduction

Elbow tendinosis is the musculotendinous degenerative condition known as "tennis elbow," or "lateral epicondylitis", which affects the extensor origin at the lateral humeral epicondyle [1]. This condition results in elbow discomfort on the lateral side without nerve damage or instability [2] and it is the most prevalent reason for elbow pain [3]. The repetitive wrist extension and supination involved in some occupational or sporting activity are considered to be the cause of discomfort with wrist extension, lateral elbow discomfort, a loss of grip strength, and as well as discomfort during rest that spreads down the forearm's dorsum from the elbow are frequent symptoms [1,2]. Although it is also a prevalent disease in men, it is more common in women between the ages of 40 and 60 [2]. A good awareness of the differential diagnosis is crucial to avoid needless testing and treatments. The diagnosis is determined clinically through the history and physical examination [1]. 70% to 80% of individuals have symptom relief during the first year. Physical therapy has been proven to be a successful first-line therapy, but a "watch-and-wait" strategy might also be a viable therapeutic choice. Although corticosteroids can temporarily relieve pain, they may have long-term negative effects on healing [3]. Despite the recent widespread media attention, there is no evidence that platelet-rich plasma injection is a reliable form of treatment [3]. In a recent meta-analysis, it was shown that hypertonic dextrose prolotherapy (DPT) injection was superior to active controls at 12 weeks for reducing

Peer-Review: Double anonymized - Two External
Plagiarism Checks: Yes - iThenticate
Complaints: geneltip@selcuk.edu.tr

Selcuk University Press
Genel Tıp Dergisi | e-ISSN: 2602-3741
https://dergipark.org.tr/tr/pub/geneltip
https://yayinevi.selcuk.edu.tr/

pain intensity and functioning by margins that satisfied standards for clinical significance in the treatment [4]. The aim of nonoperative therapy is to regenerate the damaged tendinosis tissue that causes discomfort. Rehabilitative resistance training that advances the exercise program is the cornerstone of nonoperative therapy [5]. Surgery has shown to be a viable therapy option for patients whose symptoms are unresponsive to conservative treatments [3]. In other words, the surgical approaches as indicated are quite effective in the event that rehabilitation fails [5].

Bibliometric analyses are carried out to determine the place of publications on a topic in the literature, which can provide ideas to researchers on a topic. There is current literature measuring trends in elbow tendinosis and orthopedics, but no pertinent bibliometric studies address this research area. The scientific understanding of elbow tendinosis research is therefore mapped out in this paper using a visual research tool. The goal of this paper is to analyze the hotspots, frontiers, and evolutionary paths of the elbow tendinosis literature in order to gain insight into the research situation and development trend of this field and to serve as a reference for future researchers.

Methods

In this bibliometric study, the relevant literature published in the Web of Science database's core collection by the date 30th April 2023 was examined in terms of high-impact countries or regions, institutions, authors, journals, keywords, and co-cited literature using R-bibliometrix visualization software. Both statistical and qualitative analysis was done on all the data. The information was subsequently exported into R-bibliometrix Biblioshiny visualization software and Excel for visualization and tabulation of the data.

The current study was exempted from ethical approval as it used freely accessible in a public data repository of the Web of Science electronic database.

Data sources and retrieval techniques

The core dataset of the Web of Science database was searched as below.

The search terms for the basic search selected "Article" as the document type, "English" as the language, and the 1970-01-01 to 2023-04-30 time period as the search period. The search was conducted using MeSH (Medical Subject Headings) terms related to elbow tendinosis. In the advanced search section, the phrases " TI (title) = (Elbow, Tennis OR Tennis Elbows OR Epicondylitis, Lateral Humeral OR Epicondylitides, Lateral Humeral OR Humeral Epicondylitides, Lateral OR Humeral Epicondylitis, Lateral OR Lateral Humeral Epicondylitides OR Lateral Humeral Epicondylitis OR Lateral Epicondylitis OR Epicondylitides, Lateral OR Epicondylitis, Lateral OR Lateral Epicondylitides)" were used to find pertinent articles.

Since publications in the field of orthopedics are the target of the study, the search engine has been narrowed down to orthopedics, orthopedics surgery, and sports medicine in the field of study.

The Web of Science database was selected because it is a continuously updated and thorough bibliometric database that covers publications from fields including medicine, science, technology, social sciences, humanities, and arts on a global scale [6]. This database is the most extensive electronic repository of academic knowledge. It is one of the most widely utilized bibliometrics databases as a consequence in many scientific fields. This study used the Web of Science Core Collection despite the availability of other electronic scientific databases like Scopus, PubMed, etc. Due to the various document export formats and bibliometric data creation processes used by different databases, it might not be appropriate to merge data from several sources. Also, combining these data may introduce bias [7-13]. Because of the ongoing updating of this database, the entire download process was completed on May 5, 2023, in a single day.

Inclusion and exclusion criteria

The acquired data was exported as plain text for processing and Excel outputs as "full records and cited references." The titles, abstracts, and keywords of the dataset were read. The elbow tendinitis articles fulfilled the requirements for inclusion. Publications that were not articles or did not have anything associated with elbow tendinitis were not included. Duplicate articles were not taken into consideration. Research articles from fields other than orthopedics, sport science, and orthopedics surgery were not included. Appendix 1 shows the flowchart of the study.

Visualization and analysis of data

The Bibliometrix R package (version 4.1.2, last updated on 7 March 2023) was used in this study. The Bibliometrix R package provides a range of facilities for conducting quantitative sociometric research. Massimo Aria developed Biblioshiny as a follow-up to the R-based Bibliometrix-based Shiny software. These provide bibliometric tools, analysis, and bibliometric networks [14].

Results

The search retrieved 1326 records of elbow tendinosis publications from 1970-01-01 to 2023-04-30. According to the search criteria, 526 articles published by 1817 authors from 839 affiliations on elbow tendinosis in the Web of Science database. 85.2% of them were published in Science Citation Index Expanded (SCI-EXPANDED), and 14.23% of them in Emerging Sources Citation Index (ESCI) journals. The majority of these articles were published in English (93.738 percent), with the remainder in German (4,364 percent), French (4.364 percent), and other languages (Italian, Russian, Spanish, and Turkish). 24.67% of the articles were published as open access publication type. The number of articles on elbow tendinosis has increased over time, especially after 2000. 55.6% of all articles were published in 2010 and subsequent years. The year 2019 was found as the most productive year in both the number of citations (n=916) and the number of publications (n=32) (Figure 1). The first publications

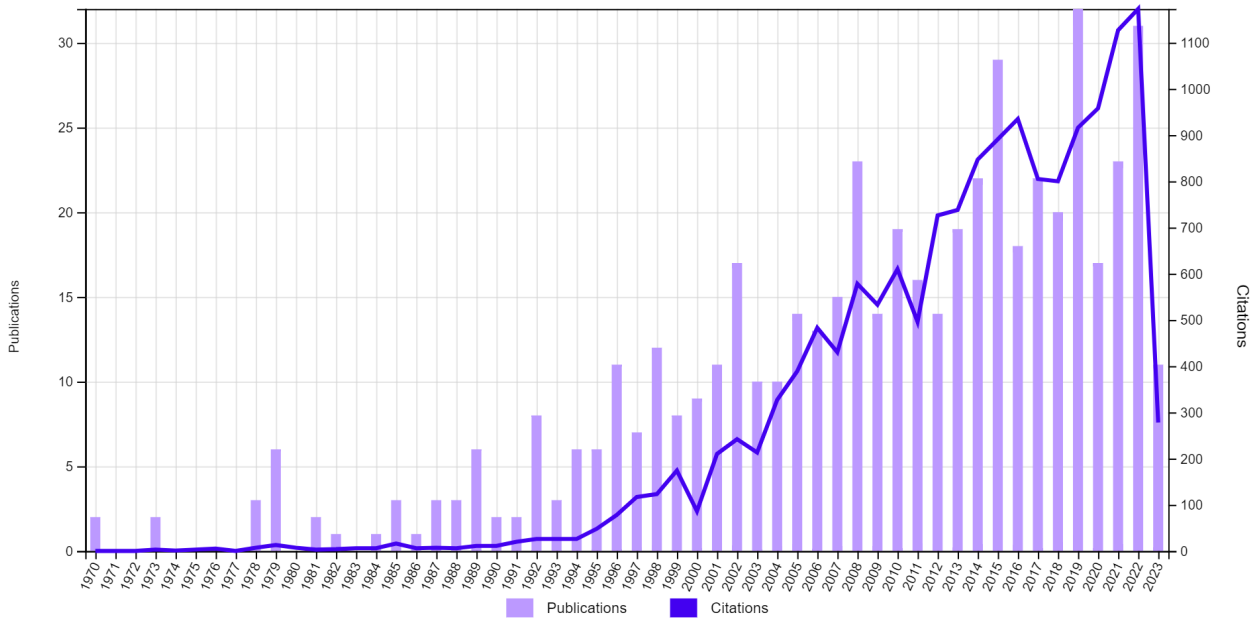

Figure 1. Times Cited and Publications Over Time

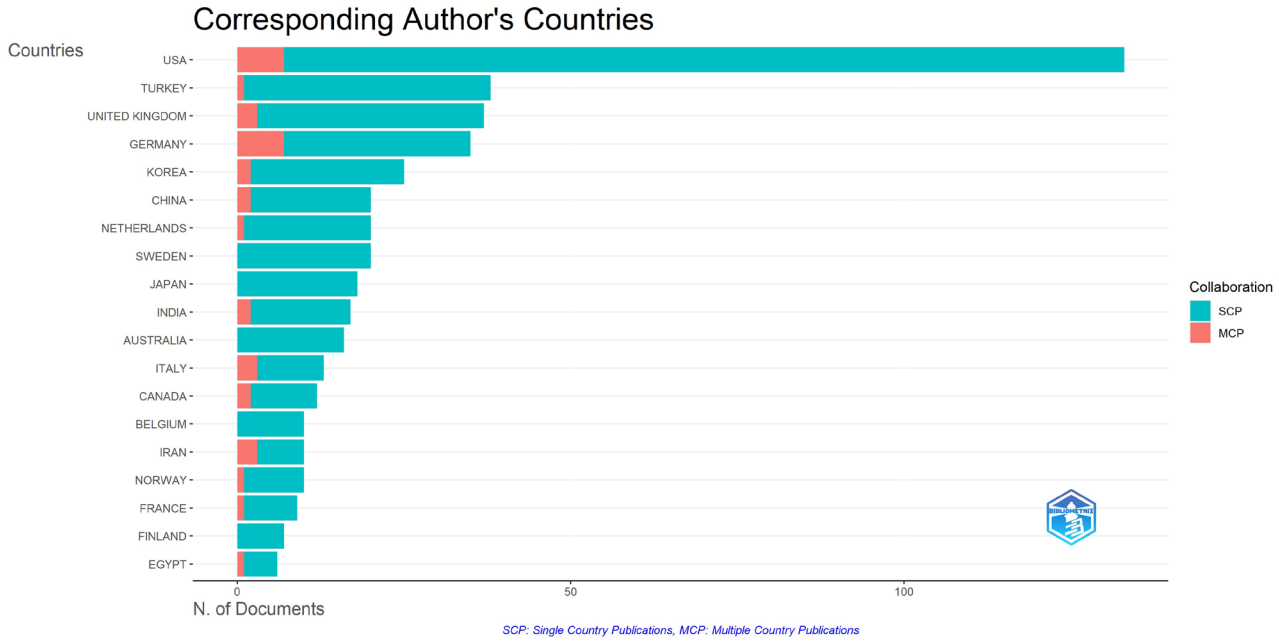

Figure 2. Corresponding Author's Countries

were published in 1970 and these publications had never been cited. These 526 publications have been cited a total of 15544 times and 12061 times without self-citation. Publications received average 29.92 citations per publication, the mean H index was 62 and the document's average age was 14.2. Table 1 provides insight into the structure of the elbow tendinosis articles.

According to the wos database's main tables, these articles were published in 47 countries and mainly from the United States (n=152, 28.84%), England (n=43, 8.16%), Germany (n=40, 7.59%), Türkiye (n= 40, 7.59%) and South Korea (n=28, 5.31%). Figure 2 is visualized with Biblioshiny software. The SCP (single country publications) concept visualized in green represents single-country publications (intra-country cooperation), while the MCP (multi country publications) concept visualized in orange represents multi-country publications (cross-country cooperation). According to the analysis made with the Biblioshiny program, the United States ranked first in the ranking of

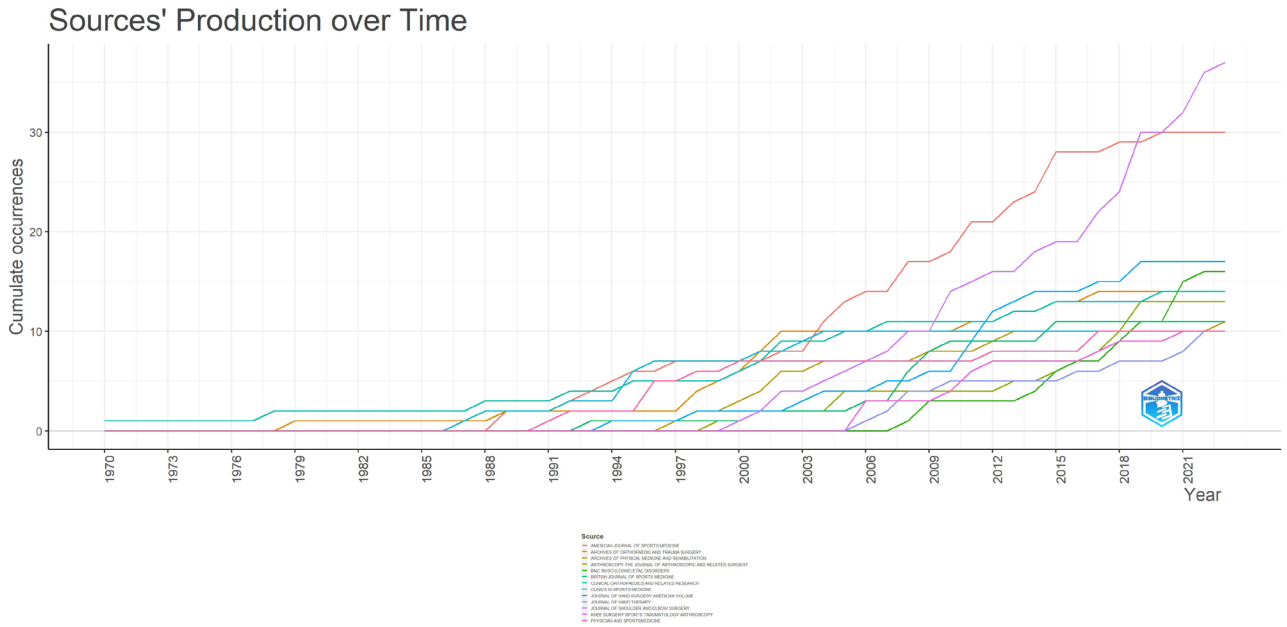

Figure 3. Sources' Production over Time

publications according to corresponding authors, but according to this analysis, Türkiye ranked 2nd (Figure 2).

The United States had the highest total citation number 4493, but Canadian publications had the highest number of average article citations (56.4) (Table 2).

This section lists the articles' sources for those that are under the research's purview (most pertinent source, source local effect by H index, etc.). (Table 3, Table 4, and Figure 3). Table 3 identifies the sources that published the largest number of articles on elbow tendinosis. Journal of Shoulder and Elbow Surgery (publisher Mosby) and the American Journal of Sports Medicine (which is the official peer-reviewed scientific journal of the American Orthopaedic Society for Sports Medicine (AOSSM) (publisher Sage Publications) published most of the articles on elbow tendinosis. Fig. 3 shows the number of article publications over time for most publishing sources. The publications published in the American Journal of Sports Medicine had the highest total number of citations (n=2841) and higher H index (25) (Table 4).

The most frequently occurred words in the keywords of the elbow tendinosis articles were tennis elbow (occurred 181 times), lateral epicondylitis (75 times), double-blind (55 times), surgical treatment (55 times), pain (54 times), management (52 times), release (50 times) and tendinopathy (50 times). The most frequently words seen in the keywords of the elbow tendinosis articles were summarized in Table 5.

Tennis elbow is the most frequently used keyword and was most frequently used in 2014. Lateral epicondylitis is the second most frequently used keyword and was most frequently used in 2011. Surgical treatment is the third most frequently used keyword and was most frequently used in 2010. The most trending topics by year are summarized in Table 6.

Table 1. General information of the articles

Description	Results
Sources (Journals, Books, etc)	130
Number of articles	526
Annual growth rate %	2.09
Document average age	14.2
Average citations per article	29.92
References number of articles	5435
KEYWORDS	
Keywords Plus (ID)	605
Author's Keywords (DE)	631
AUTHORS	
Authors	1817
Authors of single-authored docs	39
AUTHORS COLLABORATION	
Single-authored articles	41
Co-authors per articles	4.21
International co-authorships %	8.29

Table 2. Most Cited Countries

Country	Total citations	Average article citations
The United States	4493	33.8
Netherlands	1659	83
The United Kingdom	1280	34.6
Germany	1195	34.1
Sweden	870	43.5
Canada	677	56.4
Türkiye	550	14.5
Australia	430	26.9
Norway	398	39.8
China	347	17.4

Table 3. Most Relevant Sources

Sources	Articles
JOURNAL OF SHOULDER AND ELBOW SURGERY	37
AMERICAN JOURNAL OF SPORTS MEDICINE	30
JOURNAL OF HAND SURGERY-AMERICAN VOLUME	17
BMC MUSCULOSKELETAL DISORDERS	16
ARCHIVES OF ORTHOPAEDIC AND TRAUMA SURGERY	14
CLINICAL ORTHOPAEDICS AND RELATED RESEARCH	14
ARTHROSCOPY-THE JOURNAL OF ARTHROSCOPIC AND RELATED SURGERY	13
ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION	11
BRITISH JOURNAL OF SPORTS MEDICINE	11
CLINICS IN SPORTS MEDICINE	10

Table 4. Sources' Local Impact

Sources	h_index	TC	NP	PY_start
AMERICAN JOURNAL OF SPORTS MEDICINE	25	2841	30	1989
JOURNAL OF SHOULDER AND ELBOW SURGERY	16	796	37	2000
CLINICAL ORTHOPAEDICS AND RELATED RESEARCH	13	569	14	1970
JOURNAL OF HAND SURGERY-AMERICAN VOLUME	13	664	17	1994
ARCHIVES OF ORTHOPAEDIC AND TRAUMA SURGERY	11	365	14	1979
ARTHROSCOPY-THE JOURNAL OF ARTHROSCOPIC AND RELATED SURGERY	11	417	13	1999
ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION	10	575	11	1997
BMC MUSCULOSKELETAL DISORDERS	9	316	16	2008
BRITISH JOURNAL OF SPORTS MEDICINE	9	364	11	1993
CLINICS IN SPORTS MEDICINE	9	795	10	1987

***TC: Total citations; NP: number of publications, PY: publication year**

Table 5. Most Frequent Words

Words	Occurrences
tennis elbow	181
lateral epicondylitis	75
double-blind	55
surgical-treatment	55
pain	54
management	52
release	50
tendinopathy	50
randomized controlled-trial	46
platelet-rich plasma	38
tendinosis	36
follow-up	34
prevalence	33
therapy	33
corticosteroid injection	32
physiotherapy	31
carpi radialis brevis	29
corticosteroid injections	28
elbow	26
humeral epicondylitis	24
tendon	24
trial	22
reliability	20
term-follow-up	20
efficacy	19

Table 6. Trend Topics

item	freq	year_q1	year_med	year_q3
tennis elbow	181	2007	2014	2019
lateral epicondylitis	75	2006	2011	2016
surgical-treatment	55	2005	2010	2014
double-blind	55	2015	2017	2019
pain	54	2008	2015	2018
management	52	2015	2017	2019
release	50	2008	2013	2018
tendinopathy	50	2014	2016	2019
randomized controlled-trial	46	2014	2016	2018
platelet-rich plasma	38	2014	2017	2021
tendinosis	36	2011	2015	2018
follow-up	34	2010	2015	2017
therapy	33	2005	2012	2016
carpi radialis brevis	29	2013	2016	2019
corticosteroid injections	28	2008	2012	2017
humeral epicondylitis	24	2004	2010	2013
tendon	24	2009	2014	2019
term-follow-up	20	2011	2014	2017
shock-wave therapy	19	2007	2012	2018
injection	13	2011	2018	2020
epicondylitis	11	2000	2002	2006
origin	11	2008	2010	2015
pathology	11	2006	2011	2016
surgery	11	2014	2018	2018
injuries	10	1998	2000	2017

*Year q1: first occurance year, year_q3: last year of occurance, year_med: most frequently occured year, freq: number of occurrance

Discussion

The current study, which focuses on elbow tendinosis, focuses on international orthopedic literature from 1970 to April 2023. Findings show a steady increase in publications on elbow tendinosis, with a peak in 2019. Increased funding and incentives may be related to expanding study areas. Out of 526 publications, 85.20 percent were published in renowned SCIE journals. Of note, 32 publications and 916 citations were made in 2019, making up 55.6% of all publications.

By statistically analyzing publication patterns, collaborations, citations, and effects, this bibliometric study regarding elbow tendinosis improves the body of scientific literature. It charts knowledge networks, identifies upcoming research fields, and assesses influence. This analysis assesses journal quality, keeps track of international contributions to research, and analyzes publishing trends. This study may support the progress of directing future research paths by informing research goals, funding distribution with its findings. Numerous techniques are used in bibliometric research to assess the importance of publications. Bibliometric analyses are particularly helpful when evaluating a topic with a large number of published studies [7-13]. Elbow tendinosis research is one such topic, and both sports medicine and orthopedic physicians are increasingly interested in this topic. The medical literature has a staggering number of publications on elbow tendinosis, a sign of the condition's widespread interest. One issue with so many relevant articles is that it is nearly difficult for anybody, not just professionals in the subject, to keep up with everything or even to identify the most crucial ones they need to be aware of. Due to the fact that there has not been a bibliometric study of the literature on elbow tendinosis to our knowledge, we think it is time for one. Only Zhu et al. [15] published research that was comparable and this analysis focused solely on the most popular and top-cited 100 documents on elbow tendinosis.

It is possible to use many different interface programs in bibliometric analyses. However, Biblioshiny was preferred in this study. Biblioshiny is compatible with the Web of Science database and can analyze bibliometric parameters quite successfully. The bibliometric analysis interface in Biblioshiny is user-friendly. Anyone may do all analysis by selecting the appropriate tabs or buttons [17]. In this study, the analyses with Biblioshiny have been carried out to achieve deeper understanding of the current literature on elbow tendinosis.

It is possible to use many different databases such as Web of Science, Pubmed, Scopus, etc. in bibliometric analyses [7-13,18]. In the bibliometric study published by Zhu et al. [15] that analyzed the 100 most cited articles on elbow tendinosis, it was reported that the 100 most cited articles were published in 49 different journals between 1979 and 2015. The data of this study was retrieved from the Web of Science database, too.

Zhu et al. [15] analyzed the total number of citations in their study and they reported that the total number of citations ranged from 75 to 508, with citation frequency ranging from 2.2 to 37.6 citations per year. In this study, the publications have been cited a total of 15544 times and 12061 times without self-citation. Publications received averaging 29.92 citations per publication, the mean H index was 62 and the average age of documents was 14.2.

According to Zhu et al. [15], Dr. Mishra's most-cited article [19] was among the most significant ones that recommended platelet-rich plasma therapy for chronic elbow tendinosis. In the present study, the study published by Nirschl and Pettrone in 1979 [20] was the most cited study. This study received 475 citations. This publication was about the surgical treatment of elbow tendinosis. The reason for the different results obtained from the study by Zhu et al. [15] may be that only publications in orthopedics and related fields were included in the present study.

According to other previous global bibliometric analyses in orthopedy research area, the main publishing country was the USA [21-23]. In this study, there were contributions from 47 countries, predominantly from the United States, England, Germany, Türkiye and South Korea.

In bibliometrics, a cluster of keyword analysis reveals the knowledge structure, while the timeline view illustrates the development of a keyword hotspot. Keyword co-occurrence analysis reflects an academic subject's hotspots and research trends [23-25]. Zhu et al. [15] analyzed the keywords of each article included in their study using VOS viewer program network analysis. However, in the present study, keyword analysis was performed with Biblioshiny. According to Zhu et al., [15] visual figure, tennis elbow, lateral epicondylitis and pain had the highest degree of centrality. In this study, tennis elbow is the most frequently used keyword and was most frequently used in 2014. Lateral epicondylitis is the second most frequently used keyword and was most frequently used in 2011. Surgical treatment is the third most frequently used keyword and was most frequently used in 2010. In other words, the ever-changing landscape of elbow tendinosis research is revealed by this analysis. The 21st century has seen a tremendous increase in study into this ailment, including topics such as disease development, anatomy, examination methods, and therapy choices. Uncertainties still exist about complex issues including diagnosis, recurrence, and prognosis. Experimental and surgical research has been prompted by technological breakthroughs.

According to Zhu et al. [15], the United States is the most productive country, with an increase in research, especially in the 2000s. With seven of the top-cited publications coming from the Institute for Research at the University of Queensland, it is the research center that contributed the most. With 13% of the most-cited papers, the American Journal of Sports Medicine was the publication venue with the highest frequency. Thirty publications, or 30% of the total number of articles in this analysis, were published in the top three source journals for lateral epicondylitis (American Journal of

Sports Medicine, British Journal of Sports Medicine, and Journal of Bone and Joint Surgery-American Volume). In the current study, the publications published in the American Journal of Sports Medicine had the highest total number of citations (n=2841) and higher H index. The American Journal of Sports Medicine, published by the American Orthopaedic Society for Sports Medicine (AOSSM) and available for more than 40 years, is a crucial resource for the area of orthopaedic sports medicine. As a peer-reviewed scientific publication, it provides a venue for in-depth study and instruction.

Limitations

The formulation of strategic activities connected to the evaluation and characterization of scientific production on a specific topic calls for and greatly benefits from the use of bibliometric indicators. The objective was to present a critical overview of scholarly research on elbow tendinosis. The usage of a single database constrained the number of papers that could be found on the subject although this database is regarded as a multidisciplinary database with extensive coverage in medical fields. There may have been undetected literature from other databases in the field that was not included in this study because it only used the core dataset of the Web of Science database, which has drawbacks for retrieving literature. The generation of visual atlases currently lacks a standardized time partitioning, thresholding, and cropping setting process due to the various algorithms, which could lead to some bias. Also, this study did not contain content analysis. Further research can be planned on this topic or in different databases.

Conclusion

Scientific publications on elbow tendinosis in orthopaedics and related research fields are relatively few but increasing. The United States, England, Germany, Türkiye and South Korea appear to be the countries investing the most in scientific and technological developments in this field. The main scientific journals publishing on the subject are related to orthopaedic procedures in which elbow tendinosis is most commonly used. The scientific publications evaluated here aim to provide information about elbow tendinosis to orthopaedic practitioners.

References

1.Tosti R, Jennings J, Sewards JM. Lateral epicondylitis of the elbow. Am J Med. 2013;126(4): 357.e1-6. https://doi: 10.1016/j.amjmed.2012.09.018.

2.Meunier M. Lateral Epicondylitis/Extensor Tendon Injury. Clin Sports Med. 2020;39(3):657-60. https://doi: 10.1016/j.csm.2020.03.001.

3.Behrens SB, Deren ME, Matson AP, Bruce B, Green A. A review of modern management of lateral epicondylitis. Phys Sportsmed. 2012;40(2):34-40. https://doi: 10.3810/psm.2012.05.1963.

4.Zhu M, Rabago D, Chung VC, Reeves KD, Wong SY, Sit RW. Effects of Hypertonic Dextrose Injection (Prolotherapy) in Lateral Elbow Tendinosis: A Systematic Review and Meta-analysis. Arch Phys Med Rehabil. 2022;103(11):2209-18. https://doi: 10.1016/j.apmr.2022.01.166.

5.Nirschl RP, Ashman ES. Elbow tendinopathy: tennis elbow. Clin Sports Med. 2003;22(4):813-36. https://doi: 10.1016/s0278-5919(03)00051-6.

6.Liu W. The data source of this study is Web of Science Core Collection? Not enough. Scientometrics. 2019; 121:1815–24. https://doi: 10.1007/s11192-019-03238-1

7.Ekici A, Alkan S, Aydemir S, Gurbuz E, Unlu AH. Trends in Naegleria fowleri global research: A bibliometric analysis study. Acta Trop. 2022; 234:106603. https://doi: 10.1016/j.actatropica.2022.106603

8.Huang X, Wang T, Zu W, Xu T, Du L, Wang Y, Nie W, Wang L. A bibliometric analysis of global publications on graft-versus-host disease research. Medicine (Baltimore). 2022;101(27):e29634. https://doi: 10.1097/MD.0000000000029634.

9.Alkan S, Evlice O. Bibliometric analysis of global gonorrhea research. IDTM. 2022; 8(876):1-7. https://doi: 10.32113/idtm_20226_876

10.Akar A. Evaluation of Publications on Pineal Tumor from a Bibliometric Perspective. BSJ Health Sci. 2023; 6(2): 286-92. https://doi:10.19127/bshealthscience.1216243

11.Çelik M, Ceylan MR, Arslan Y, Dinçer NG, Alkan S. Bibliometric analysis of publications on Hepatitis D virus published in1984–2022. Cent. Asian j. med. Hypotheses. 2023:4(1):22-33. https://doi.org/10.47316/cajmhe.2023.4.1.02INFECTIOUS DISEASES OBSERVATIONAL RESEARCH

12.Bahşi İ, Adanır SS, Kervancıoğlu P, Orhan M, Govsa F. Bibliometric Analysis of Turkey's Research Activity in the Anatomy and Morphology Category from the Web of Science Database. Eur J Ther. 2021;27(4):268-80. https://doi: 10.5152/eurjther.2021.20108

13.Alkan S, Urkmez, F Y. A Bibliometric Analysis Study on Pregnancy and COVID-19. J Med Microbiol. 2023;11(1): 53-9. URL: http://jommid.pasteur.ac.ir/article-1-510-en.html

14.Aria M, Cuccurullo C. bibliometrix: An R-tool for comprehensive science mapping analysis. J Informetr . 2017; 11(4): 959-75. https://doi.org/10.1016/j.joi.2017.08.007

15.Zhu S, He Z, Bi Q, Cao L, Gu H, Zhang Q, et al. The 100 most cited articles in lateral epicondylitis research: A bibliometric analysis. Front Surg. 2023; 9:913818. https://doi: 10.3389/fsurg.2022.913818

16.Bond M, Zawacki□Richter O, Nichols M. Revisiting five decades of educational technology research: A content and authorship analysis of the British Journal of Educational Technology. Br. J. Educ. Technol. 2019; 50(1): 12-63. https://doi.org/10.1111/bjet.12730

17.Büyükkıdık S. A Bibliometric Analysis: A Tutorial for the Bibliometrix Package in R Using IRT Literature. J. Meas. Eval. Educ. Psychol. 2022; 13(3): 164-93. https://doi.org/10.21031/epod.1069307

18.Bilden A, Gurbuz E, Aydemir S, Unlu A, Ekici A, Alkan S, et al. Global Trends on Blastocystis sp. Research: A Scientometric Study. Parasitol United J. 2023; [Articles in Press/ Available Online]. http://doi: 10.21608/puj.2023.195093.1201

19.Mishra A, Pavelko T. Treatment of chronic elbow tendinosis with buffered platelet-rich plasma. Am J Sports Med. 2006;34(11):1774-8. http:// 10.1177/0363546506288850

20.Nirschl RP, Pettrone FA. Tennis elbow. The surgical treatment of lateral epicondylitis. J Bone Joint Surg Am. 1979;61(6A):832-9.

21.Li C, Wang L, Perka C, Trampuz A. Clinical application of robotic orthopedic surgery: a bibliometric study. BMC Musculoskelet Disord. 2021;22(1):968. http://doi: 10.1186/s12891-021-04714-7

22.Cheng Y, Yang H, Guan L, Hai Y, Pan A. Bibliometric and Visualized Analyses of Research Studies on Different Analgesics in the Treatment of Orthopedic Postoperative Pain. Pain Res Manag. 2022;2022:6835219. http://doi: 10.1155/2022/6835219

23.Zhou T, Xu Y, Xu W. Emerging research trends and foci of studies on the meniscus: A bibliometric analysis. J Orthop Surg (Hong Kong). 2020 ;28(3):2309499020947286. http://doi:10.1177/2309499020947286.

24.Kuyubaşı SN, Demirkıran ND, Kozlu S, Öner SK, Alkan S. Global Analysis of Chronic Osteomyelitis Publications with a Bibliometric Approach. Cyprus J Med Sci. 2023;8(1):8-12. https://doi.org/10.4274/cjms.2022.2021-234

25.Kurt M. Protez Enfeksiyonları Konulu Bilimsel Çıktıların Analizi. BSJ Health Sci. 2023; 6(1): 34-9. https://doi.org/10.19127/bshealthscience.1156517