SCOPING REVIEW

Recent Trends and Hotspots in Knee Arthroplasty: A Bibliometric Analysis and Visualization Study of the Last Five-Year Publications

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Abstract

Objectives: Bibliometric analysis is one of the most prevalent methods for analyzing and predicting the research trends of particular subjects. Through a bibliometric analysis, this study sought to look into and depict the hotspots and research trends in knee arthroplasty research over the previous five years.

Methods: The Web of Science Core Collection database was used to find research articles on knee arthroplasty published between 2018 and 2022. The VOS viewer, Cite Space, and Bibliometrix were used to carry out the bibliometric study and network visualization

Results: During the previous five years, 7,422 included knee arthroplasty publications were cited 57,087 times. The United States and the Journal of Arthroplasty were the top countries and journals regarding the number of articles. The top 10 global high-impact documents were determined using the citation ranking and citation burst. The most frequently referenced article revealed that the epidemiological characteristics of knee arthroplasty, perioperative care in knee arthroplasty, prosthetic joint infections, and opioid medications were the hot topics in knee arthroplasty research. Keyword burst analysis showed that the research trends in knee arthroplasty through 2022 were racial disparity, limb alignment, tibial slope, and meniscectomy. The analysis of the subject areas revealed the close connections and relationships between different subject areas, as demonstrated by the figures.

Conclusion: The knee arthroplasty research community is highly productive and centralized. Recent hotspots in knee arthroplasty research were unicompartmental knee arthroplasty, periprosthetic joint infection, kinematic alignment, outpatient total knee arthroplasty (TKA), bariatric surgery, payment model, tranexamic acid, Robotic-Assisted TKA, patient-reported outcome measures, metaphyseal cone, opioid use, and patient-specific instrumentation. Research trends in knee arthroplasty research were racial disparity, limb alignment, tibial slope, and meniscectomy.

Level of evidence: IV

Keywords: Bibliometric analysis, Knee arthroplasty, Knee replacement, Trends, Visualization

Introduction

Joint arthroplasty is a significant advancement in treating chronic refractory joint pain.[1] It is prescribed for patients who have failed to respond to conservative medical therapy. Total knee arthroplasty (TKA) is the most commonly used treatment for end-stage knee osteoarthritis (OA).[2] Because of the rising prevalence of knee OA, global demand for TKA is soaring. The total number of primary TKA procedures is expected to increase by 85%.[3,4] TKA growth can also be viewed as a source of tension for the government, insurers, individuals, and businesses dealing with unrelenting growth in healthcare spending.[5] Despite the clinical and economic policy importance of TKA, studies have yet to be conducted to evaluate recent trends over time.

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The bibliometric approach to reviews has recently gained popularity due to several factors, such as the introduction of software tools, cross-disciplinary methodologies, and increased capabilities for handling large volumes of data.[6] Because bibliometric methodologies are objectively quantitative, they avoid bias associated with sample selection in a systematic review. Bibliometric methodologies are also well suited to identifying trends in journal performance, co-authorship, co-citations, and classic research streams in specific fields.[7]

To assist researchers in understanding the trends and hotspots in knee arthroplasty, this study examined a corpus of knee arthroplasty articles to answer questions such as the following: 1) Which countries, institutions, and authors contributed to the arthroplasty literature and how has the output and scholarly impact of those participants evolved over the five years between 2018 and 2022?; 2) How have collaborations between countries and authors evolved in the last five years?; and 3) What are the hot topics in the knee arthroplasty literature, and how has that topic affected knee arthroplasty literature in the last five years?

Materials and Methods

Data Sources

The Web of Science Core Collection (WoSCC) was used to gather the data for this study. The search strategy was "knee arthroplasty" OR "knee replacement" as the topic. Articles published within the last five years, document type of article, WoS category of orthopedics, and written in the English language were included. Data were collected on 31 December 2022.

Data Collection and Processing

Relevant data from the WoSCC were retrieved to describe the number of papers published per year, the number of countries' publications, and the number of journal publications in the field of knee arthroplasty. All knee arthroplasty-related articles, including references, were exported as plain text for country collaboration analysis, keyword co-occurrence analysis, and keyword burst analysis.

Statistical and Bibliometric Analysis

Bibliometric analysis was carried out using CiteSpace version 6.1.R6 (Drexel University, Philadelphia, PA, USA),[8] VOS viewer version 1.6.18 (Leiden University, The Netherlands),[9] and Bibliometrix version 4.0 (an R package; University of Naples Federico, Italy).[10] The keyword burst analysis was performed to obtain temporal trends in keywords in the field of knee arthroplasty.[11] The most recent burst keywords were identified as research frontier issues, implying that future breakthroughs in these areas are possible. To determine subject collaborations, the co-occurrence of subject categories was investigated. The number of occurrences of a subject category was used to weigh the data. The larger it was, the more examples there were in a subject group. Subject category temporal rings, the thickness indicating the number of subject category occurrences in the subsequent year, were used to demonstrate temporal patterns in subject category occurrences. The connecting line between subject areas symbolized interdisciplinary collaboration. The larger the connecting line, the stronger the collaboration.

Results

Global Research Output Distribution

There were 7,422 articles published in 79 countries about knee arthroplasty research. These articles were cited 57,087 times. Every year, approximately 1,600 articles were published; additionally, there has been an increasing trend in publication numbers from 2019 till now [Figure 1A]. The analysis of countries revealed that the United States had the most publications-four times more than China, which came in second, followed by England and Japan, ranking third and fourth, respectively [Figure 1B]. Within the last five years, there has been a publication burst on knee arthroplasty in Argentina, Israel, Colombia, and Ireland [Figure 2A]. Collaborations between countries are represented by red lines, with the diameter of the lines proportional to the number of collaborations between countries [Figure 2B]. Eighty-three journals published articles on knee arthroplasty research; the *Journal of Arthroplasty (JOA)* (n=1,827, 25%), *Knee Surgery, Sports Traumatology, Arthroscopy* (n=614, 8%), and *Journal of Knee Surgery* (n=583, 8%) had the most articles published [Figure 3A]. Regarding research institutions, the Hospital for Special Surgery ranked first, with 320 articles [Figure 3B].

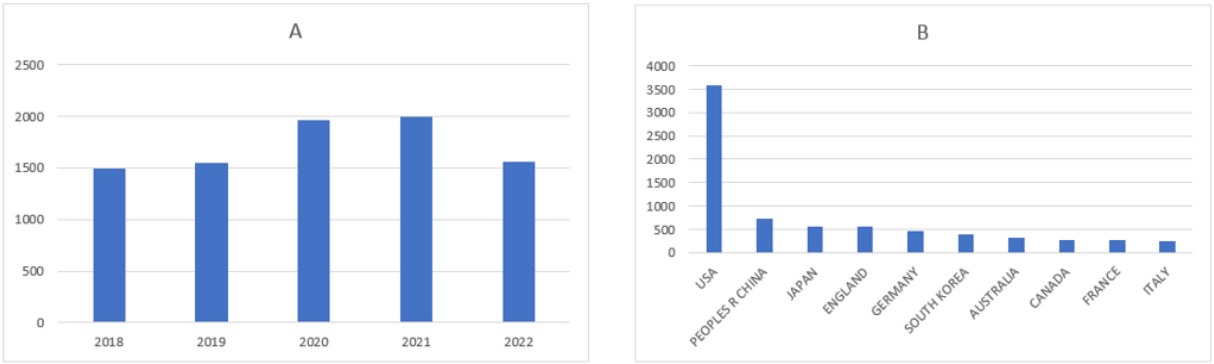

Figure 1. Global Research Output Distribution: (A) publication number per year, (B) top 10 publication numbers per country

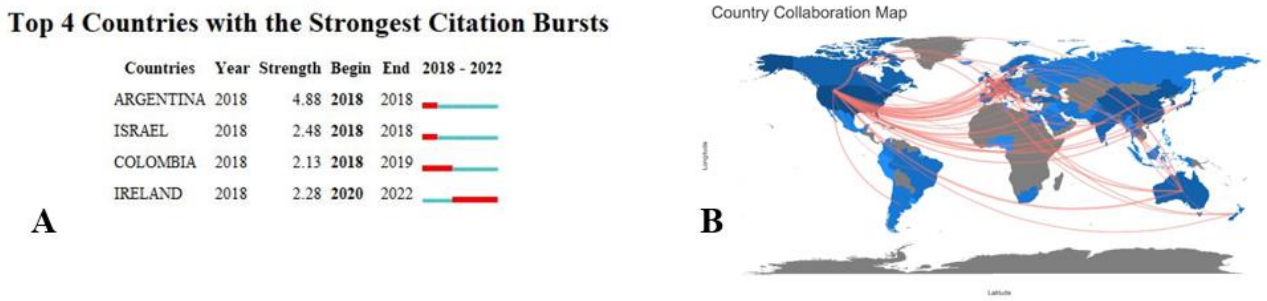

Figure 2. (A) Countries with citation burst in last 5 years, (B) Between Countries Collaborations

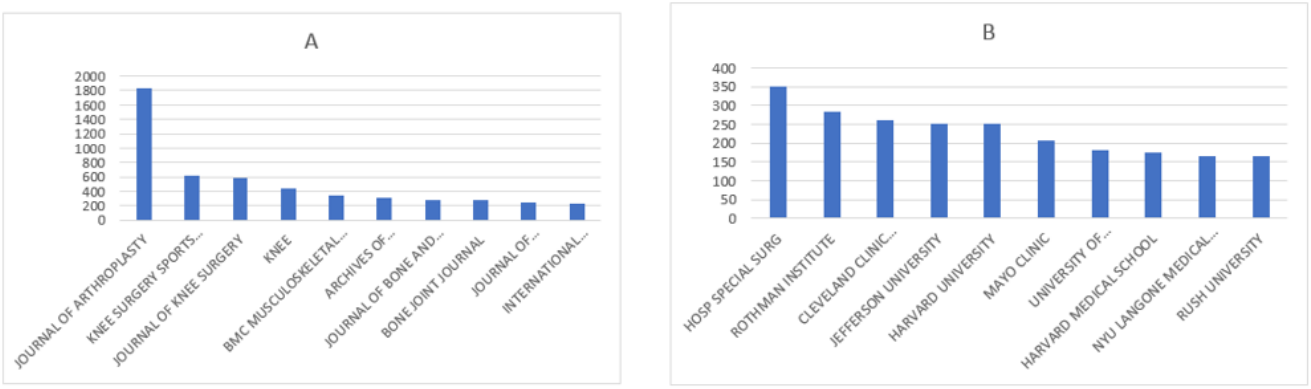

Figure 3. (A) Top 10 publication numbers per journal, (B) Top 10 publication numbers per institution

Authors

In the last five years, 19,451 authors published articles on knee arthroplasty. Mont MA contributed the most, with 152 publications and 2,365 citations in knee arthroplasty [Table 1; Figure 4A]. The analysis of co-authorship in knee arthroplasty is detailed in [Figure 4B]. An author's minimum number of citations was set at 180, and his or her minimum number of publications was set at 25-the size of the node's scales with citation.

Table 1. Authors with the highest citations and publications

Author	Citations	Publication	h-Index	g-Index
Mont MA	2365	151	27	41
Parvizi J	1638	89	22	37
Della Valle CJ	1264	68	21	34
Higuera CA	1029	76	19	28
Sodhi N	1181	72	19	31
Tan TL	767	43	19	25
Khlopas A	831	39	18	27
Pei FX	715	52	18	24
Abdel MP	895	86	17	26
Courtney PM	643	71	16	21

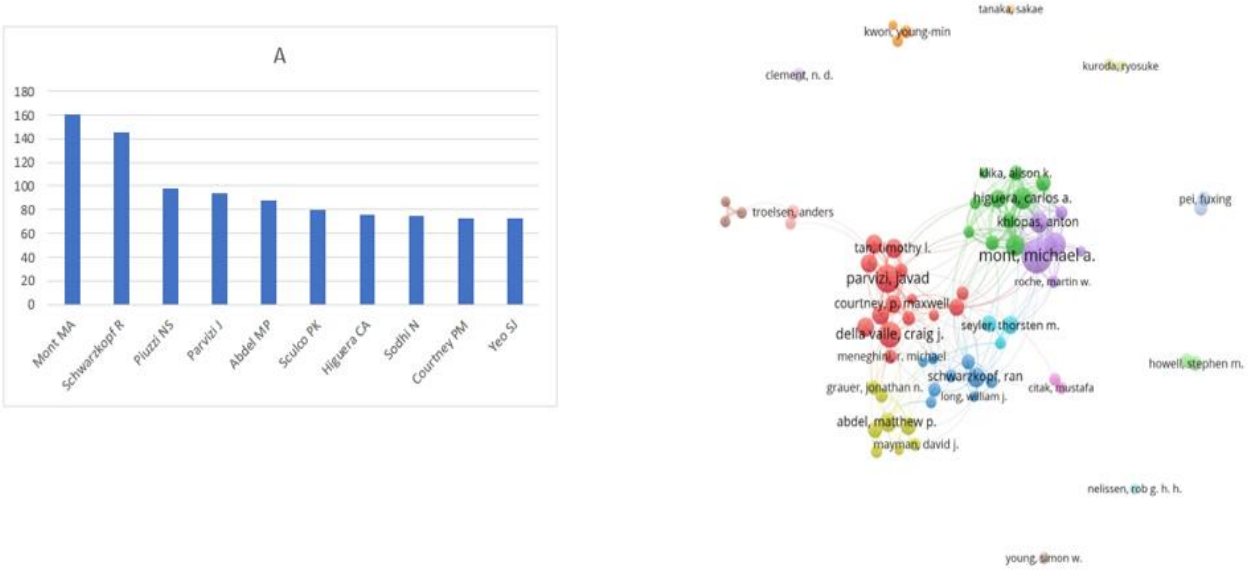

Figure 4. (A) Top 10 publication numbers per author, (B) Co-authorship relationships

Most Influential Papers

The current study identified the top ten references with the highest number of citation bursts in knee arthroplasty, which assists researchers in locating topics of particular interest in the history of scholarly publications [Figure 5; Table 2]. The documents with the most citations per year are detailed in [Table 3].

Top 10 References with the Strongest Citation Bursts

References	Year	Strength	Begin	End	2018 - 2022
Kurtz SM, 2014, J BONE JOINT SURG AM, V96A, P624, DOI 10.2106/JBJS.M.00285,	2014	24.2	**2018**	2019	
Sharkey PF, 2014, J ARTHROPLASTY, V29, P1774, DOI 10.1016/j.arth.2013.07.024,	2014	16.89	**2018**	2019	
Dossett HG, 2014, BONE JOINT J, V96B, P907, DOI 10.1302/0301-620X.96B7.32812,	2014	14.17	**2018**	2019	
Liddle AD, 2014, LANCET, V384, P1437, DOI 10.1016/S0140-6736(14)60419-0,	2014	13.56	**2018**	2019	
Parvizi J, 2014, J ARTHROPLASTY, V29, P1331, DOI 10.1016/j.arth.2014.03.009,	2014	12.65	**2018**	2019	
Bozic KJ, 2014, CLIN ORTHOP RELAT R, V472, P188, DOI 10.1007/s11999-013-3034-3,	2014	11.14	**2018**	2019	
Kremers HM, 2015, J BONE JOINT SURG AM, V97A, P1386, DOI 10.2106/JBJS.N.01141,	2015	15.63	**2019**	2020	
Singh JA, 2019, J RHEUMATOL, V46, P1134, DOI 10.3899/jrheum.170990,	2019	17.47	**2021**	2022	
Sloan M, 2018, J BONE JOINT SURG AM, V100, P1455, DOI 10.2106/JBJS.17.01617,	2018	15.44	**2021**	2022	
Schwartz AM, 2020, J ARTHROPLASTY, V35, PS79, DOI 10.1016/j.arth.2020.02.030,	2020	13.08	**2021**	2022	

Figure 5. Publications with the strongest citation bursts

Table 2. Articles with the highest citation bursts from 2018 to 2022

#	Title
1	Impact of the Economic Downturn on Total Joint Replacement Demand in the United States Updated Projections to 2021[1]
2	Why Total Knee Arthroplasties Failing Are Today-Has Anything Changed After 10 Years?[2]
3	A Randomized Controlled Trial of Kinematically and Mechanically Aligned Total Knee Replacements[3]
4	Adverse Outcomes after Total and Unicompartmental Knee Replacement in 101,330 Matched Patients: A Study of Data from the National Joint Registry for England and Wales[4]
5	Definition of Periprosthetic Joint Infection[5]
6	Bundled Payments in Total Joint Arthroplasty: Targeting Opportunities for Quality Improvement and Cost Reduction[6]
7	Prevalence of Total Hip and Knee Replacement in the United States[7]
8	Rates of Total Joint Replacement in the United States: Future Projections to 2020-2040 Using the National Inpatient Sample[8]
9	Projected Volume of Primary Total Joint Arthroplasty in the U.S., 2014 to 2030[9]
10	Projections and Epidemiology of Revision Hip and Knee Arthroplasty in the United States to 2030[10]

1. Kurtz SM, Ong KL, Lau E, Bozic KJ. Impact of the Economic Downturn on Total Joint Replacement Demand in the United States: Updated Projections to 2021. JBJS. 2014; 96(8).
2. Sharkey PF, Lichstein PM, Shen C, Tokarski AT, Parvizi J. Why are total knee arthroplasties failing today--has anything changed after 10 years? J Arthroplasty. Sep 2014; 29(9):1774-8. doi:10.1016/j.arth.2013.07.024.
3. Dossett HG, Estrada NA, Swartz GJ, LeFevre GW, Kwasman BG. A randomised controlled trial of kinematically and mechanically aligned total knee replacements: two-year clinical results. Bone Joint J. Jul 2014; 96-b (7):907-13. doi:10.1302/0301-620x.96b7.32812.
4. Liddle AD, Judge A, Pandit H, Murray DW. Adverse outcomes after total and unicompartmental knee replacement in 101,330 matched patients: a study of data from the National Joint Registry for England and Wales. Lancet. Oct 18 2014; 384(9952):1437-45. doi: 10.1016/s0140-6736(14)60419-0.
5. Parvizi J, Gehrke T. Definition of Periprosthetic Joint Infection. The Journal of Arthroplasty. 2014; 29(7):1331. doi:10.1016/j.arth.2014.03.009.
6. Bozic KJ, Ward L, Vail TP, Maze M. Bundled Payments in Total Joint Arthroplasty: Targeting Opportunities for Quality Improvement and Cost Reduction. Clinical Orthopaedics and Related Research®. 2014; 472(1)
7. Maradit Kremers H, Larson DR, Crowson CS, et al. Prevalence of Total Hip and Knee Replacement in the United States. JBJS. 2015; 97(17)
8. Singh JA, Yu S, Chen L, Cleveland JD. Rates of Total Joint Replacement in the United States: Future Projections to 2020–2040 Using the National Inpatient Sample. The Journal of Rheumatology. 2019; 46(9):1134-1140. doi:10.3899/jrheum.170990
9. Sloan M, Premkumar A, Sheth NP. Projected Volume of Primary Total Joint Arthroplasty in the U.S., 2014 to 2030. JBJS. 2018; 100(17)
10. Schwartz AM, Farley KX, Guild GN, Bradbury TL, Jr. Projections and Epidemiology of Revision Hip and Knee Arthroplasty in the United States to 2030. The Journal of Arthroplasty. 2020; 35(6):S79-S85. doi:10.1016/j.arth.2020.02.030

Table 3. Articles with the highest citation per year from 2018 to 2022

Author, Year, Journal	Title	Total Citations	TC per Year
Sloan M, 2018, j bone joint surg am	Projected Volume of Primary Total Joint Arthroplasty in the U.S., 2014 to 2030[1]	633	126.60
Wainwright TW, 2020, acta orthop	Consensus Statement for Perioperative Care in Total Hip Replacement and Total Knee Replacement Surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations[2]	149	49.67
Schwartz AM, 2020, j arthroplasty	Projections and Epidemiology of Revision Hip and Knee Arthroplasty in the United States to 2030[3]	128	42.67
Izakovicova P, 2019, efort open rev	Periprosthetic Joint Infection: Current Concepts and Outlook[4]	167	41.75
Ackerman IN, 2019, bmc musculoskel dis	The Projected Burden of Primary Total Knee and Hip Replacement for Osteoarthritis in Australia to the Year 2030[5]	146	36.50
Klug A, 2021, knee surg sport tr a	The Projected Volume of Primary and Revision Total Knee Arthroplasty Will Place an Immense Burden on Future Health Care Systems over the Next 30 Years[6]	71	35.50
Premkumar A, 2021, j arthroplasty	Projected Economic Burden of Periprosthetic Joint Infection of the Hip and Knee in the United States[7]	66	33.00
Sabatino MJ, 2018, j bone joint surg am	Excess Opioid Medication and Variation in Prescribing Patterns Following Common Orthopaedic Procedures[8]	159	31.80
Schwarz EM, 2019, j orthop res	2018 International Consensus Meeting on Musculoskeletal Infection: Research Priorities from the General Assembly Questions[9]	122	30.50
Tarabichi M, 2018, j bone joint surg am	Diagnosis of Periprosthetic Joint Infection: The Potential of Next-Generation Sequencing[10]	143	28.60

1. Sloan M, Premkumar A, Sheth NP. Projected Volume of Primary Total Joint Arthroplasty in the U.S., 2014 to 2030. JBJS. 2018; 100(17)
2. Wainwright TW, Gill M, McDonald DA, et al. Consensus statement for perioperative care in total hip replacement and total knee replacement surgery: Enhanced Recovery After Surgery (ERAS(®)) Society recommendations. Acta Orthop. Feb 2020; 91(1):3-19. doi:10.1080/17453674.2019.1683790
3. Schwartz AM, Farley KX, Guild GN, Bradbury TL, Jr. Projections and Epidemiology of Revision Hip and Knee Arthroplasty in the United States to 2030. The Journal of Arthroplasty. 2020; 35(6):S79-S85. doi:10.1016/j.arth.2020.02.030
4. Izakovicova P, Borens O, Trampuz A. Periprosthetic joint infection: current concepts and outlook. EFORT Open Rev. 2019; 4(7):482-494. doi:10.1302/2058-5241.4.180092
5. Ackerman IN, Bohensky MA, Zomer E, et al. The projected burden of primary total knee and hip replacement for osteoarthritis in Australia to the year 2030. BMC Musculoskelet Disord. Feb 23 2019; 20(1):90. doi: 10.1186/s12891-019-2411-9
6. Klug A, Gramlich Y, Rudert M, et al. The projected volume of primary and revision total knee arthroplasty will place an immense burden on future health care systems over the next 30 years. Knee Surg Sports Traumatol Arthrosc. Oct 2021; 29(10):3287-3298. doi: 10.1007/s00167-020-06154-7
7. Premkumar A, Kolin DA, Farley KX, et al. Projected Economic Burden of Periprosthetic Joint Infection of the Hip and Knee in the United States. J Arthroplasty. May 2021; 36(5):1484-1489.e3. doi:10.1016/j.arth.2020.12.005
8. Sabatino MJ, Kunkel ST, Ramkumar DB, Keeney BJ, Jevsevar DS. Excess Opioid Medication and Variation in Prescribing Patterns Following Common Orthopaedic Procedures. J Bone Joint Surg Am. Feb 7 2018; 100(3):180-188. doi:10.2106/jbjs.17.00672
9. Schwarz EM, Parvizi J, Gehrke T, et al. 2018 International Consensus Meeting on Musculoskeletal Infection: Research Priorities from the General Assembly Questions. J Orthop Res. May 2019; 37(5):997-1006. doi:10.1002/jor.24293
10. Tarabichi M, Shohat N, Goswami K, et al. Diagnosis of Periprosthetic Joint Infection: The Potential of Next-Generation Sequencing. J Bone Joint Surg Am. Jan 17 2018; 100(2):147-154. doi:10.2106/jbjs.17.00434

Research Trends

The co-citation correlation and cluster network map were created in this study using 22,288 references from 7,422 articles (duplicates were left out). The title's clustered network of knee arthroplasty is detailed in [Figure 6]. The co-cited references were divided into 13 major clusters based on their titles. A timeline view of the top 5 clusters map, which aids in identifying emerging foci in knee arthroplasty, is detailed in [Figure 7]; each node represents a significant study. The number of nodes is related to the number of citations for that study.

Burst Detection with Keywords

We have identified the top 30 keyword bursts from 2018 to 2022 based on an analysis of 7,422 articles [Figure 8]. A red line from the beginning to the end year represented the period of a citation burst.

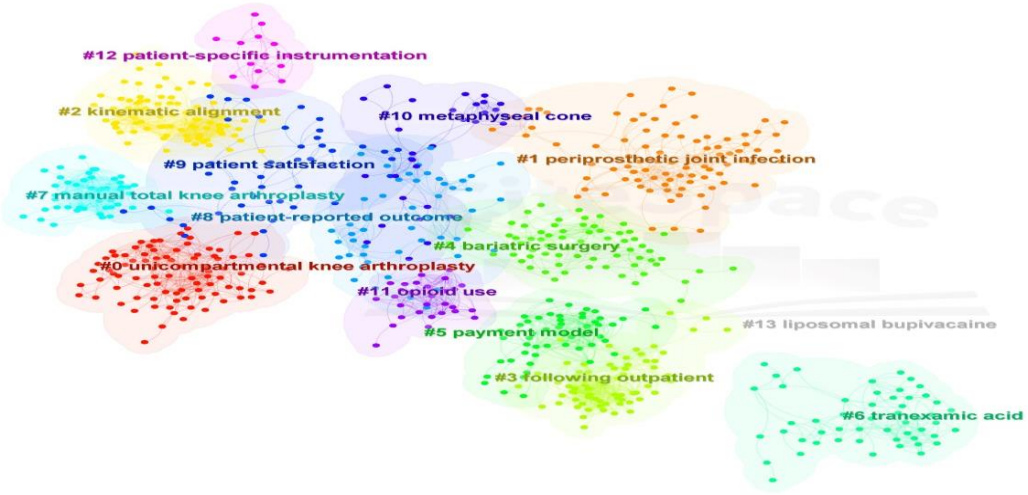

Figure 6. Network view of co-cited references clustered by title

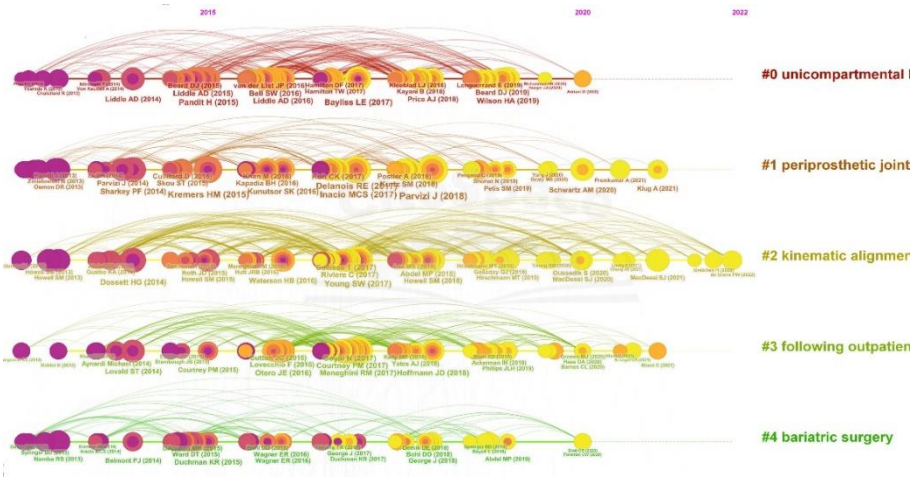

Figure 7. Timeline view of co-cited references clustered by title

Top 30 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2018 - 2022
metaanalysis	2018	14.81	**2018**	2018	
randomized controlled trial	2018	9.34	**2018**	2018	
orthopedic surgery	2018	7.76	**2018**	2018	
population	2018	7.5	**2018**	2018	
in vitro	2018	6.93	**2018**	2018	
liposomal bupivacaine	2018	6.12	**2018**	2019	
clinical trial	2018	5.58	**2018**	2018	
replacement surgery	2018	5.51	**2018**	2018	
arthroscopy	2018	5.2	**2018**	2018	
quality improvement program	2018	5.2	**2018**	2018	
varus deformity	2018	4.79	**2018**	2018	
joint registry	2018	4.73	**2018**	2019	
spine surgery	2018	4.73	**2018**	2018	
osteoarthritic knee	2018	4.73	**2018**	2018	
american college	2018	4.45	**2018**	2019	
of the literature	2018	4.25	**2018**	2018	
thickness	2018	4.17	**2018**	2019	
migration	2019	5.49	**2019**	2019	
cutting block	2019	5.49	**2019**	2019	
sonication	2019	4.99	**2019**	2019	
tissue	2019	4.71	**2019**	2019	
diabetes mellitus	2018	4.24	**2019**	2019	
revision tka	2020	5.16	**2020**	2022	
meniscectomy	2020	4.28	**2020**	2020	
slope	2018	4.14	**2020**	2020	
angle	2020	4.08	**2020**	2022	
racial disparity	2021	6.2	**2021**	2022	
long term	2021	4.24	**2021**	2022	
limb alignment	2021	4.24	**2021**	2022	
surgeon	2021	4.24	**2021**	2022	

Figure 8. Keywords with the strongest citation bursts

Discussion

In the current study, we employed bibliometric mapping to visualize the results of our analysis of knee arthroplasty literature published between 2018 and 2022. We looked into the history of knee arthroplasty and its possible future directions. The following report includes resources and recommendations for further study.

Global Research Output Distribution

From 2018 to 2022, there was a slight increase in knee arthroplasty publications. With the most publications on knee arthroplasty, the United States dominated the field. In addition, collaboration studies revealed that the United States had the most collaborations with other nations. Citations for knee arthroplasty have recently increased in Argentina, Israel, Colombia, and Ireland. As a result, additional collaborations with these countries may be formed. There were numerous intercontinental collaborations in knee arthroplasty; however, most collaborations were between the United States and European nations. The top ten institutions were all from the United States, except one from China. JOA had the most papers, total citations, and h-index in the field of knee arthroplasty, as well as the most articles and citations. JOA policies may have a direct effect on the knee arthroplasty research community. Previous bibliometric evaluations of joint replacements also identified JOA as the most important journal.[12]

Authors

All of the top ten authors were from the United States. Author collaborations were observed using co-authorship analysis. Numerous collaborations among leading authors have indicated that knee arthroplasty literature is highly centralized.

Most Influential Papers

The top-cited article information is one of the most valuable indicators in the bibliometric approach and is frequently evaluated in orthopedic-related bibliometric studies. Our research revealed the top ten references with the highest citation bursts, assisting researchers in identifying topics of particular interest in the historical evolution of scholarly publications. The most influential academic papers for the last three years were epidemiologic studies about the "projected volume of knee arthroplasty in 2030".[13-15] Highly cited articles were about "epidemiology of TJA",[13,14,16,17] "periprosthetic joint infection (PJI)",[18-21] "perioperative care",[22] and "opioid medication".[23]

Research Hotspots

Based on the co-cited references clustered by title, most of the cited papers in recent knee arthroplasty literature were about (I) "Unicompartmental Knee Arthroplasty (UKA)", (II) "PJI", (III) "Kinematic Alignment (KA)", (IV) "Outpatient TKA", (V) "Bariatric Surgery", (VI) "Payment Model", (VII) "Tranexamic Acid (TXA)", (VIII) "Manual TKA", (IX) "Patient-Reported Outcome Measures (PROM)", (X) "Metaphyseal Cone", (XI) "Opioid Use", and (XII) "Patient-Specific Instrumentation (PSI)".

(I) Despite the great success rates of current implants, UKA has relatively significant failure and revision rates, particularly when compared to TKA. These higher rates of failure and revision are primarily reported in the first five years after surgery and are frequently related to improper indications and surgical errors. Recent research looked into the causes of UKA failures and how to avoid them.[24] (II) The diagnosis of PJI might be challenging. All existing diagnostic tests have issues with accuracy and outcome interpretation. Many novel tests have been proposed, but there has yet to be an agreement on which should be placed in the diagnostic process.[25] (III) Although mechanical alignment has long been considered the gold standard, the best alignment approach for TKA is currently being debated. The goal of KA is to restore native alignment by respecting the three axes of rotation of the knee and providing knee motion that is more akin to the native knee. There is convincing evidence that utilizing a KA strategy produces comparable or better clinical outcomes without increasing the probability of failure in the short, medium, and even long term.[26] (IV) Improved perioperative recovery methods following TKA have resulted in shorter, more streamlined hospital stays for many patients. A paradigm shift toward outpatient TKA surgery has occurred due to the deployment of value-based care and bundled payment programs.[27] (V) People who are severely obese and have undergone a TKA for osteoarthritis are at a higher risk of short- and long-term complications than other patients. Recent research attempted to answer the issue, Does bariatric surgery minimize complication risk after TKA in patients with severe obesity?[28] (VI) Alternative payment models were developed to improve total joint arthroplasty care value. More than half of arthroplasty surgeons now participate in a bundled payment model. In comparison to other specialties, they have become engaged essential stakeholders involved in the entire episode of treatment and have dramatically cut costs while maintaining or improving quality. The trend toward value-based bundled payment models in total joint arthroplasty emphasizes identifying modifiable risk factors for increased costs and options to reduce perioperative chronic disease treatment.[29-31] (VII) TXA is an antifibrinolytic agent that has fundamentally altered blood management in TKA by making transfusions unlikely. Intravenous and topical TXA are becoming more effective. In patients who are at a higher risk of thrombosis, physicians may recommend topical therapy alone because it has the best safety profile.[32] (VIII) Robotic TKA has grown in popularity to improve patient satisfaction and implant survival by improving component placement accuracy and precision. Recent studies evaluate robotic-assisted TKA and conventional manual TKA regarding implant survival, complication rates, clinical results, and radiological outcomes.[33] (IX) With the rising importance of patients' involvement in the care they receive, PROM-based outcomes evaluation is increasingly accompanying traditional clinical methods of evaluating the effects of TKA on the patient.[34] (X) Metaphyseal porous metal implants (cones and sleeves) in revision TKA have recently gained favor, with promising short- and mid-term outcomes. In aseptic and septic revision, metaphyseal cones and sleeves appear to be realistic and feasible alternatives in revision TKA.[35] (XI) According to recent research, orthopedic surgeons

overprescribe opioids following surgery, and many patients do not take all their prescriptions. Following TKA, patients have moderate to severe postoperative pain, impacting postoperative rehabilitation, patient satisfaction, and overall results. Opioids have historically been frequently used for perioperative pain treatment in TKA; however, this is altering.[36,37] (XII) PSI has been commercially launched throughout the last decade to simplify and improve the effectiveness, precision, and efficiency of TKA surgery above conventional mechanical instrumentation and computer-assisted surgery. Nonetheless, there are significant grounds against using PSI regularly.[38]

Burst Detection with Keywords

Some keywords were irrelevant [Figure 8]; this is due to WoS's Keywords Plus feature. Keywords Plus data are terms or phrases that appear frequently in the titles of an article's references but not in the title of the article itself. Keywords Plus extends the capability of cited-reference searching by searching across disciplines for all articles that have cited references in common. It is based on a particular algorithm that is unique to WoS databases. Keywords Plus cannot be modified because they are created from cited titles. Based on the co-occurrence keyword burst detection in knee arthroplasty, the newest research trends were “racial disparity”, “limb alignment”, “tibial slope”, and “meniscectomy”. On average, African American TKA patients have worse clinical results than whites, with lesser improvements in PROM and a higher incidence of complications, hospital readmissions, and reoperations. The causes of these racial health disparities are unknown, but they likely involve patients, providers, the healthcare system, and societal variables; recent studies address these disparities.[39] In recent investigations, the theory of kinematic alignment has challenged classic mechanical alignment concepts that focus on restoring neutral limb alignment.[40] The tibial slope is linearly related to the postoperative range of motion and extensor mechanism function. Furthermore, it affects tibial insert wear and loosening and TKA instability. Currently, there is no agreement on the optimal tibial slope, and recommendations range from 0° to 10°.[41] According to new research, patients with meniscal tears who receive arthroscopic partial meniscectomy are at increased risk of progressing to end-stage osteoarthritis necessitating TKA. Recent research evaluated meniscectomy versus meniscal repair in terms of reoperation rates and complication rates.[13,42-44]

Conclusion

This study provided a brief analysis of knee arthroplasty-related research based on the WoSCC database. Recent hotspots in knee arthroplasty research were UKA, PJI, KA, outpatient TKA, bariatric surgery, payment model, TXA, Robotic-Assisted TKA, PROM, metaphyseal cone, opioid use, and PSI. Research trends in knee arthroplasty research were racial disparity, limb alignment, tibial slope, and meniscectomy. This study also showed that the knee arthroplasty research community is very productive and highly centralized.

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