



Bibliometric Analysis of Studies Conducted in the Field of Sports Law

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Abstract

Sports law systematically addresses legal issues that arise within sports organizations and activities. As sport permeates all aspects of life, legal challenges encountered by sports-related subjects and institutions are resolved through this specialized branch of law. Academic research in sports law not only aids in resolving disputes but also contributes to the development of the field. This study employs bibliometric analysis to examine the body of research on sports law. Data for this research were obtained in March 2024 by searching for the keyword “sports law” on the Scopus search engine. The analysis considered variables such as the annual increase in publications, universities, countries, most cited authors, journals, publications, trending topics, rankings of cited journals, and keyword groups, aiming to explore the relationships between these variables. The study reviewed 2,159 studies on sports law spanning from 1906 to 2024 using “VOSviewer”. The most cited publication identified is by Zadeh et al. (2004), which has received 415 citations. The “International Sports Law Journal” leads the journals with 114 articles. Stellenbosch University is the top-contributing institution with 22 publications. The author contributing most extensively to this literature is “Yang, J.” with 11 articles. Frequently occurring words in the studies include “sport, laws, athlete, occurrence, physical activity, doping.” This research is significant as it serves as a resource for further investigations in the field of sports law.

Keywords: Sports, Law, VOSviewer, Scopus, Biblioshny, Bibliometric Analysis

INTRODUCTION

Rules are essential in all human relationships. Sports law, a specialized branch of law, addresses disputes involving individuals and institutions within the realm of sports. This field governs discussions related to sports, the actions of athletes, and disputes arising from sporting transactions (Esendal, 2014). Historically, sports have encountered numerous problems and disputes, the resolution of which has only been possible through sports law. As a component of private law, sports law settles disputes that occur within the context of sporting activities (Dinç, 2009). By rendering fair and honest judgments in all disputes within sports law, the rights of athletes are safeguarded, and fair competition is ensured solely through legal rules (Li & Qiao, 2015).

In line with global developments in the field of sports, sports law has emerged as a distinct branch of law, anticipated to address the disputes that arise and meet the demands of the sports industry (Pepe, 2019). Sports law serves as both an essential prerequisite and a necessity for resolving disputes in the sports industries and sports activities (Çolakoğlu, 2009).

With the global industrial growth of sports, disputes began to arise that fell outside the general legal framework, necessitating the creation of a specialized branch of law. This requirement laid the foundation for the development of sports law (Özsoy, 2008).

This study conducts a bibliometric analysis of research on sports law. Data were retrieved in March 2024 by searching the keyword “sports law” in the Scopus database. The research analyzed trends such as the annual increase in publications, contributing universities, countries, the most cited authors, journals, publications, trending topics, rankings of cited journals, and keywords, and it sought to uncover the relationships among these variables. This investigation was confined to the Web of Science, as the majority of relevant studies were located within this database.

This study employed bibliometric analysis, a quantitative research method. In bibliometric analysis, academic and scientific publications related to the subject under investigation are collected. The data derived from these collected studies are classified, analyzed, and interpreted according to specific standards (Baker et al., 2020). Bibliometric analysis is crucial for identifying existing gaps in any scientific field. This method yields more reliable and objective results when data are compiled (Aria & Cuccurullo, 2017). A key aspect of bibliometric analysis is the quantification of qualitatively defined data sets, transforming them into figures and diagrams (Pritchard, 1969; Berger & Baker, 2014). This transformation facilitates easier comprehension of the data.

In recent years, the method of bibliometric analysis has been employed across all scientific disciplines and has become a prevalent research approach. The development of software tools such as VOSviewer and Leximancer has enhanced the utility of this method. Furthermore, the increasing usefulness and accessibility of databases such as Web of Science and Scopus have contributed to the popularity of this method (Donthu et al., 2021).

This study applies bibliometric analysis to enhance the limited body of literature on sports law in Turkish. It systematically reviews the field by utilizing data downloaded in March 2024 from the Scopus search engine using the keyword “sports law.” The data were compiled with the VOSviewer software. The analysis included variables such as the annual increase in publications, universities, countries, most cited authors, journals, publications, trending topics, and keywords, with detailed descriptions of the results. This study meticulously examines the existing research in the field of sports law.

METHOD

This study employed bibliometric analysis, a method that systematically and transparently retrieves data from a specific research field. It provides a comprehensive overview of the phenomena or events being investigated, enabling detailed examination (Saggeese et al.,

2016). Bibliometric analysis facilitates the quantitative examination of bibliographic materials, offering a holistic view and aiding in the identification of research areas classified by articles, authors, and journals.

Bibliometric analysis has been extensively applied across various disciplines and has been utilized in diverse ways within the field of sports. A key attribute of bibliometric analysis is its measurability, providing researchers with valuable insights into the existing literature on their topic of investigation. This fosters interdisciplinary collaboration (Niu et al., 2013). Bibliometric methods have evolved into a distinct scientific specialization within both academic and applied realms, becoming an essential component of research and evaluation techniques (Ellegaard et al., 2015). Through bibliometric analysis, it is possible to rigorously examine vast quantities of data. This research approach helps to reveal evolutionary trends within a specific area, thereby contributing significantly to the research field (Donthu et al., 2021).

Data processing and tools used

When conducting bibliometric analyses, databases such as Scopus, Web of Science, and PubMed are typically preferred for initial data retrieval. Subsequent filtering within the chosen database may involve criteria such as document type, publication language, publication type, and publication year. In this study, the data were downloaded from the Scopus database in March 2024. For the bibliometric analysis of scientific articles in the field of sports law, the data were downloaded in CSV format using specific inclusion and exclusion criteria. In the final stage of the bibliometric analysis, software tools such as “R,” “bibliometrix,” and “VOSviewer” were utilized. This study provides a comprehensive overview of publications in the field of sports law, examining annual publication trends, average citation counts, journals, institutions, prominent authors, and international collaborations. The data are presented through Sankey diagrams, factor analysis, tables, and figures.

FINDINGS

The publications on sports law researched with Biblioshny were evaluated. Summarized information about the researched topic can be found in Figure 1.



Figure 1. Basic Information

As illustrated in Figure 1, a total of 2,159 documents featuring the keyword “sports law” were retrieved from Scopus for the period 1906 to 2024. The analyzed articles were written by 5,388 different authors, with 718 of these being single-author articles. The average annual citation frequency for the articles is 11.87. Furthermore, the average age of the articles is 11.2 years. The authors used 5,503 distinct keywords in their studies, and the studies collectively reference 1,161 sources. The average annual growth rate of the publications stands at 2.77, and the average number of co-authors per document is 2.79. The documents authored by a single individual total 718. The total number of references cited across these studies is 70,676.

Annual increase in publications

Figure 2 illustrates how the number of studies on sports law has evolved over the years. From 1906 to 1964, the average annual publication rate was approximately three, with only minor fluctuations. There was a noticeable increase in 1965. Subsequent decades saw both declines and rises, but the overall trend was upward. Post-2008, the volume of articles published in the field of sports law significantly increased. For instance, around 125 articles were published in 2013, 199 articles in 2022, 140 articles in 2023, and 25 articles by March 3, 2024.

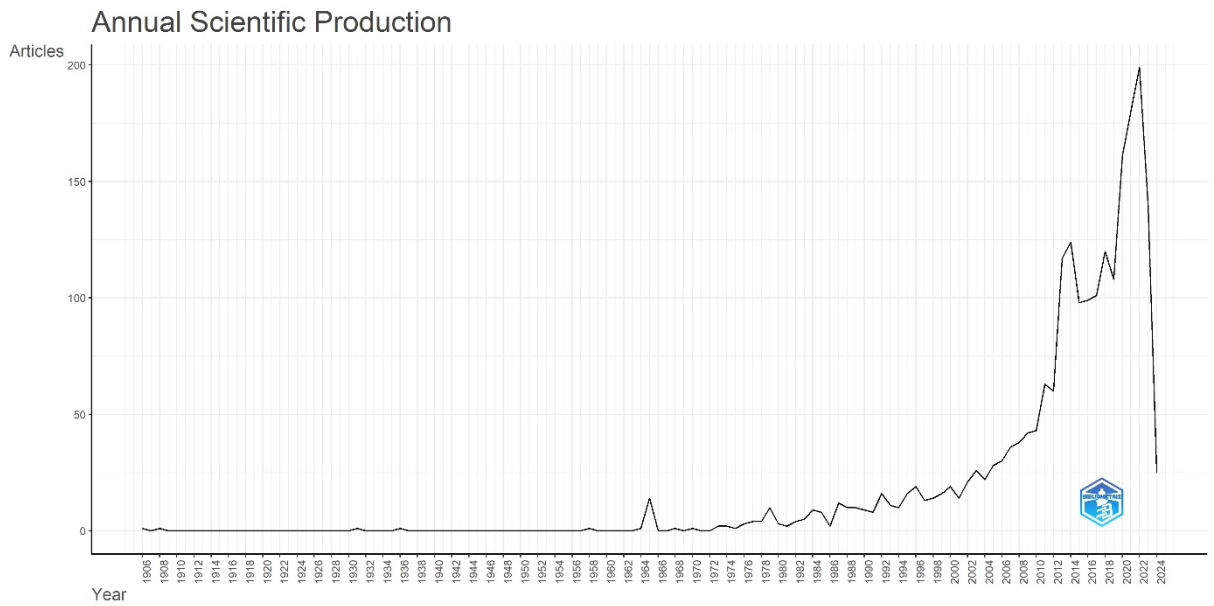


Figure 2. Annual Status of Publications

Sankey diagram

The three variables (keyword, author, country) to be associated in the Sankey diagram using the biblioshny program are given in Figure 3.

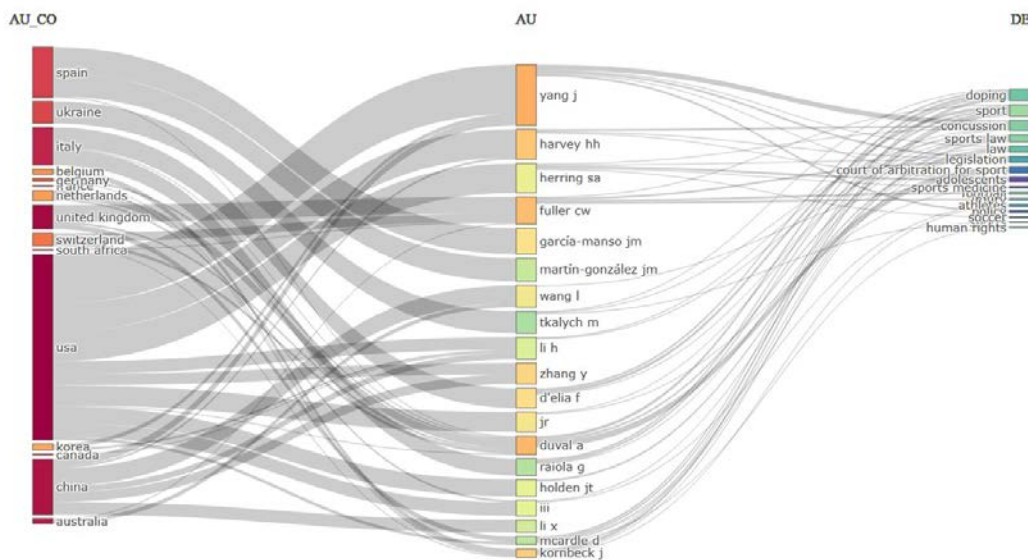


Figure 3. Sankey Diagram

According to Figure 3, the size of the rectangles in the diagram represents the significance of the variables used in the literature. The Sankey diagram shows that the “United States of America” ranks highest among countries in the field of sports law. The author “Yang, J.” has published the most works in this area. Additionally, “doping” is identified as one of the most

frequently used keywords in the literature. The keyword most commonly associated with Yang, J., the most prolific contributor to the field, is “concussion.”

Most cited journals

The ranking of journals publishing on sports law is given in Figure 4.

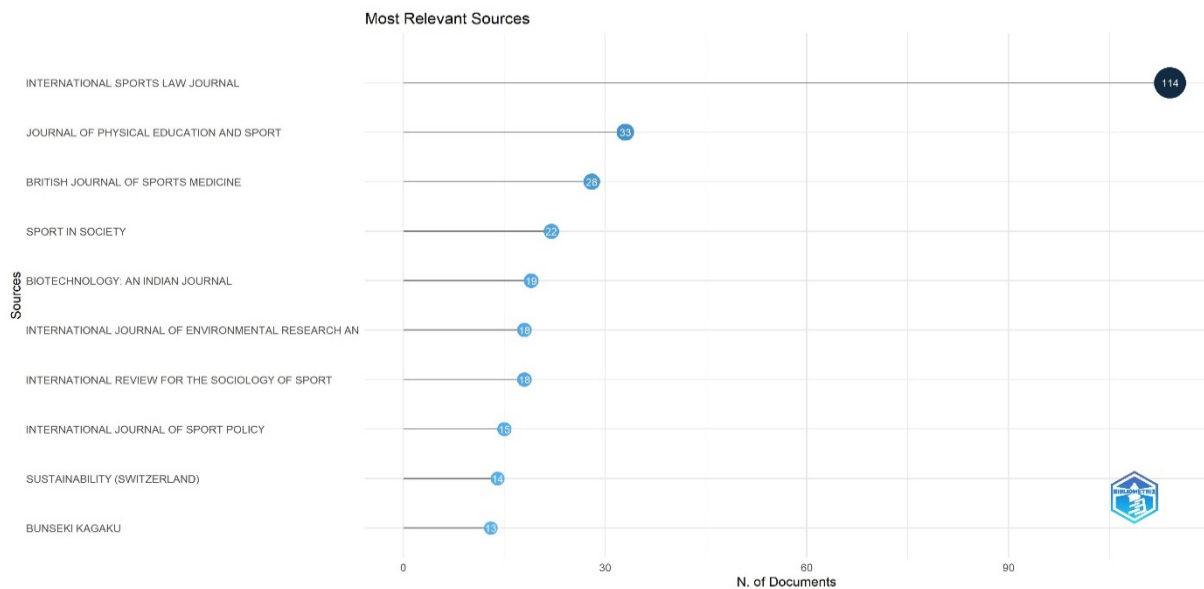


Figure 4. Most Important Journals

In the field of sports law, “International Sports Law Journal” ranks first with 114 articles. With 33 articles, “Journal of Physical Education and Sport” ranks second and “British Journal of Sports Medicine” ranks third with 28 articles. Finally, the journal that contributed the least to the literature was “Bunsex₁ Kagaku” with 13 articles.

Most cited authors

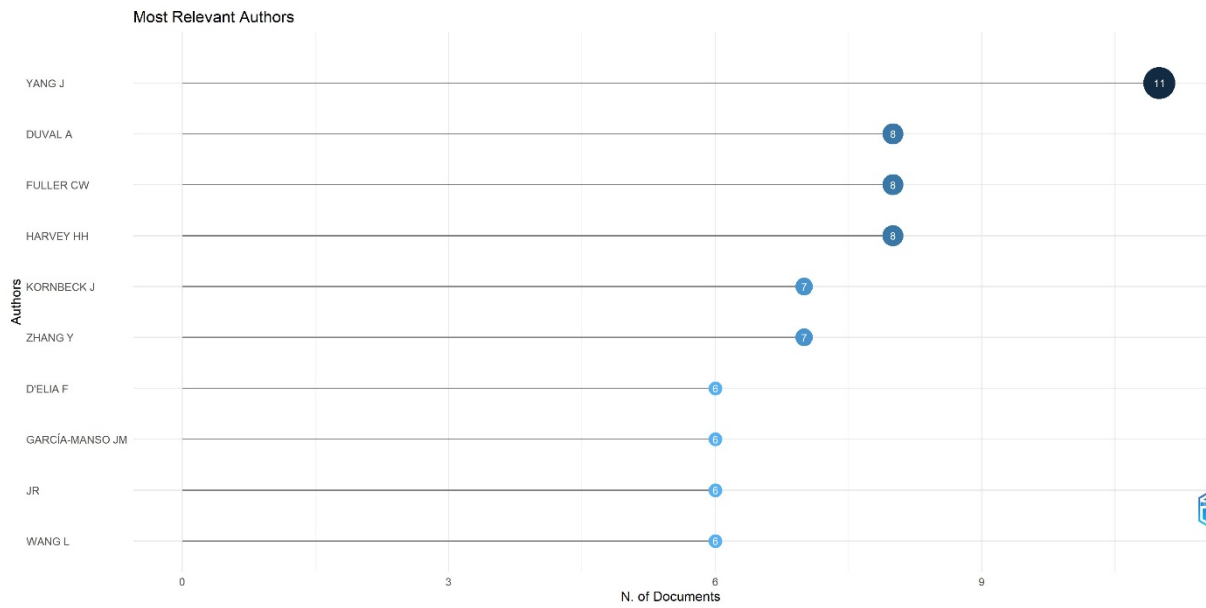


Figure 5. Most Important Authors

In the field of sports law, “Yang J.” ranks first with 11 articles. He is followed by “Duval A., Fuller CW., Harvey HH.” with 8 articles. With 7 articles, “Kornbeck j., Zhang Y.” ranks third. The authors who contributed to the literature with 6 articles each are “D’elia F., Garcia-Manso JM., JR., Wang L.”.

Most important institutions or organizations

The number of publications belonging to the universities to which the authors working on sports law words are affiliated is shown in Figure 6.

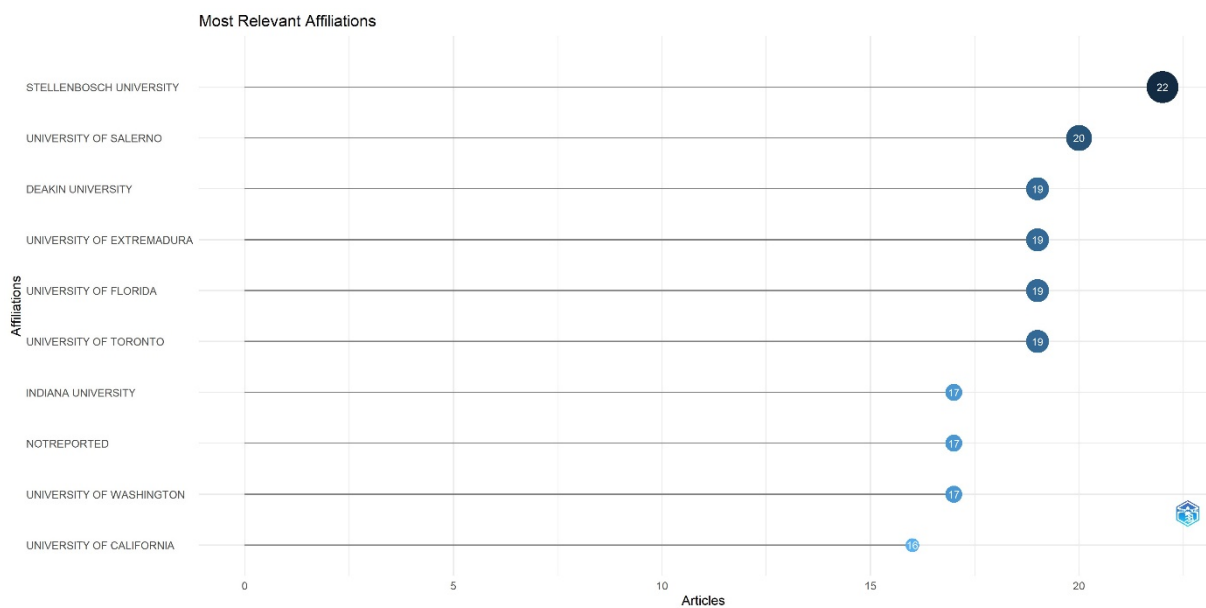


Figure 6. Most Important Universities

“Stellenbosch University” with 22 publications, “University of Salerno” with 20 publications and “Deakin University, University of Extremadura, University of Florida, University of Toronto” with 19 publications rank third.

Most productive countries

In this analysis, Figure 7 shows the countries with the most cited publications, Figure 8 shows the most productive countries and Figure 9 shows the relationship map between these countries.

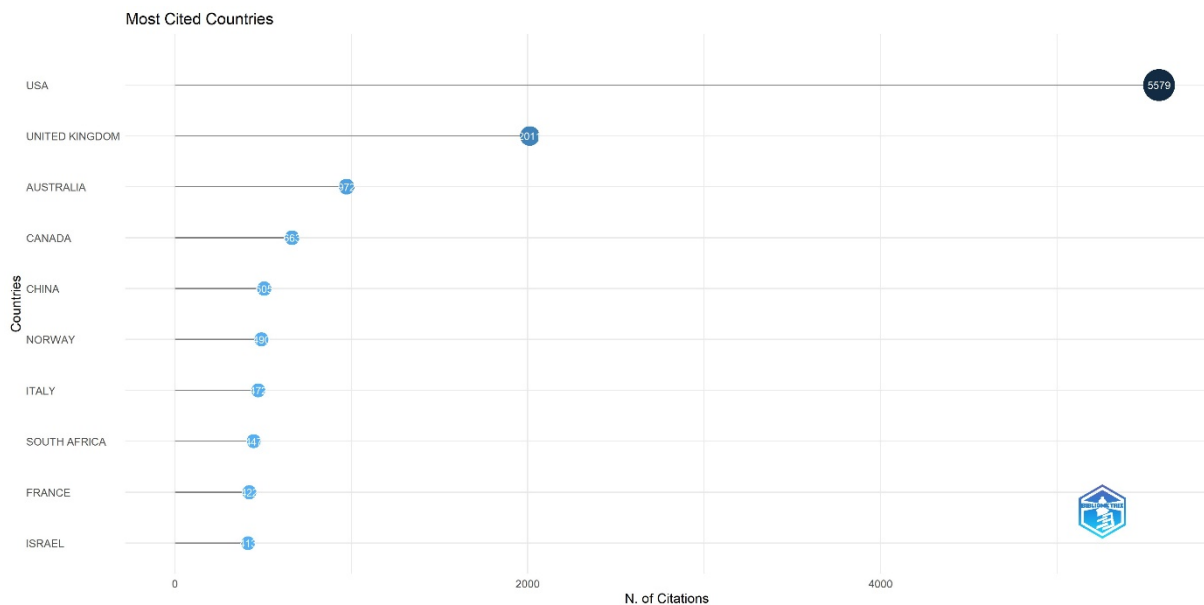


Figure 7. Most Cited Countries

The USA ranks first with 5,579 citations. The United Kingdom ranks second with 2,011 citations and Australia ranks third with 972 citations. Canada with 663 citations, China with 605 citations, Norway with 490 citations, Italy with 472 citations, South Africa with 447 citations and France with 422 citations. The country with the least cited publications is Israel with 413 citations.

Country Scientific Production

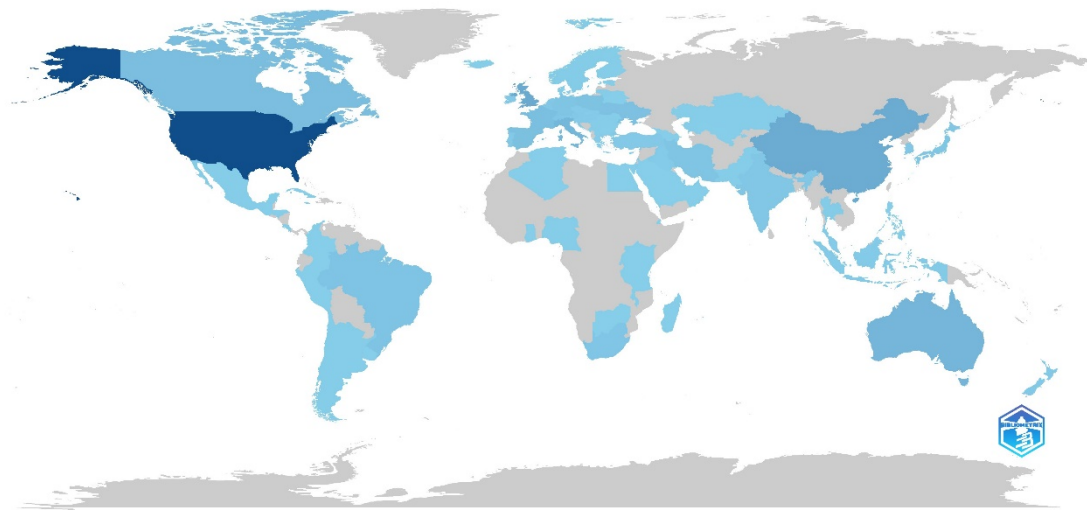


Figure 8. Productivity of Countries

As the most productive country, the USA ranks first with 1,664 articles, the United Kingdom ranks second with 446 articles, China ranks third with 417 articles, Australia ranks fourth with 294 articles and Italy ranks fifth with 266 articles.

Country Collaboration Map

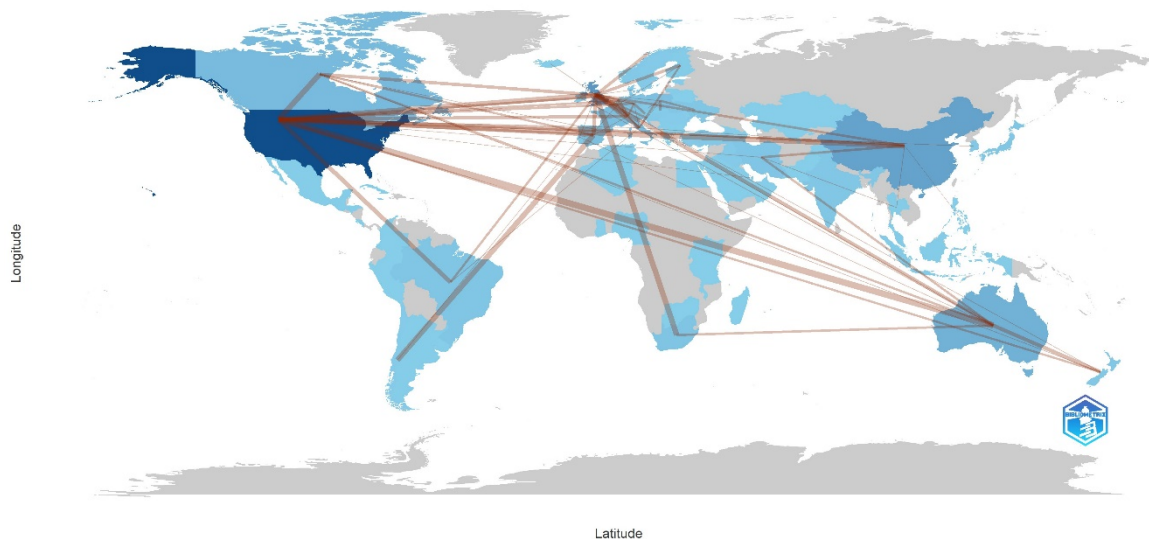


Figure 9. Cooperation Network Map of Countries

Table 1. Most Cooperating Countries

From	To	Frequency
USA	AUSTRALIA	11
SPAIN	CHILE	9
UNITED KINGDOM	SOUTH AFRICA	9
USA	CANADA	9
USA	CHINA	9
USA	UNITED KINGDOM	8
UNITED KINGDOM	BELGIUM	6
UNITED KINGDOM	IRELAND	6
UNITED KINGDOM	SWITZERLAND	6
USA	BRAZIL	6

According to Table 1, the USA is the country that collaborates most frequently with other nations, participating in 43 studies. The United Kingdom follows with 27 studies, and Spain ranks third with 9 studies. The USA's primary collaboration partners are Australia, Canada, China, the United Kingdom, and Brazil. The USA collaborates most extensively with Australia (11 articles), Canada (9 articles), China (9 articles), the United Kingdom (8 articles), and Brazil (6 studies). The UK's main collaboration partners are South Africa, Belgium, Ireland, and Switzerland, conducting 9 studies with South Africa and 6 each with Belgium, Ireland, and Switzerland. Spain primarily collaborates with the Republic of Chile, with whom it has conducted 9 studies.

Most cited publications

The most important article is the one with the highest total number of citations. Accordingly, the 10 most important articles are given in Table 2.

Table 2. The most important Articles in the Literature

Paper	DOI	Total Citations	TC per Year
Arbab-Zadeh A., 2004, circulation	10.1161/01.CIR.0000142863.71285.74	415	19,76
Murphy na, 2008, pediatrics	10.1542/peds.2008-0566	298	17,53
Steinvil a, 2011, j am coll cardiol	10.1016/j.jacc.2010.10.037	267	19,07
Cambray ja, 2003, hydrobiologia	10.1023/A:1024648719995	260	11,82
Frost hm, 1992, bone miner	10.1016/0169-6009(92)90875-E	241	7,30
Reynolds jc, 1996, mammal rev	10.1111/j.1365-2907.1996.tb00150.x	210	7,24
Bertram jea, 1991, biol rev camb philos soc		209	6,15
Braun ol, 1989, j econ psychol	10.1016/0167-4870(89)90018-4	201	5,58
Bathgate a, 2002, br j sports med	10.1136/bjsm.36.4.265	196	8,52
Müller m, 2015, j am plann assoc	10.1080/01944363.2015.1038292	188	18,80

The article "Effect of Aging and Physical Activity on Left Ventricular Compliance" by Zadeh et al. (2004), published in the National Library of Medicine, is the most cited article with

415 citations. The second most cited article, “Promoting the Participation of Children with Disabilities in Sports, Recreation, and Physical Activities” by Murphy and Carbone (2008), also published in the National Library of Medicine, has received 298 citations. The third most cited article, “Mandatory Electrocardiographic Screening of Athletes to Reduce Their Risk for Sudden Death: Proven Fact or Wishful Thinking?” by Steinvil et al. (2011), published in the National Library of Medicine, has 267 citations.

Conceptual structure map

In this section, the network map, trending topics, tree map and thematic map connected to the keyword sports law through factor analysis are presented. Figure 10 shows the map of the factor analysis.

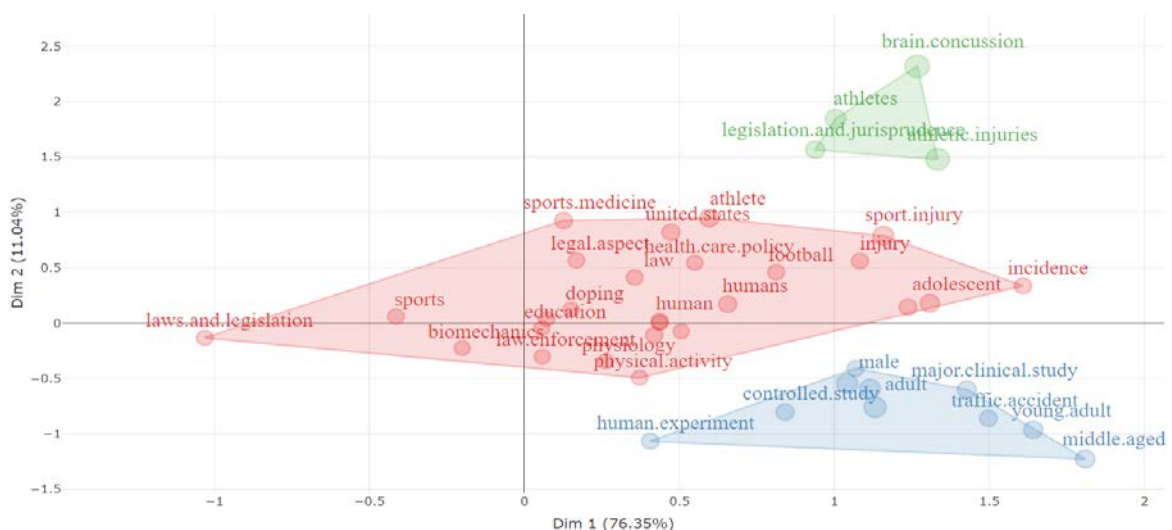


Figure 10. Factor Analysis

In the factor analysis map, words from the literature are displayed in colored sections according to their significance. The most frequently used and crucial words are shown in red. This red cluster includes terms such as “laws,” “athletes,” “sports,” “incidence,” and “physical activity.” The second most frequently used group of words is grouped in the blue cluster, which contains terms like “human,” “male,” “important,” “traffic,” and “young.” Words that are least frequently used are aggregated in the green cluster. This visual organization helps highlight the relative importance and usage frequency of terms in the field.

Thematic map

The map of thematically researched articles in the field of sports law is shown in Figure 11.

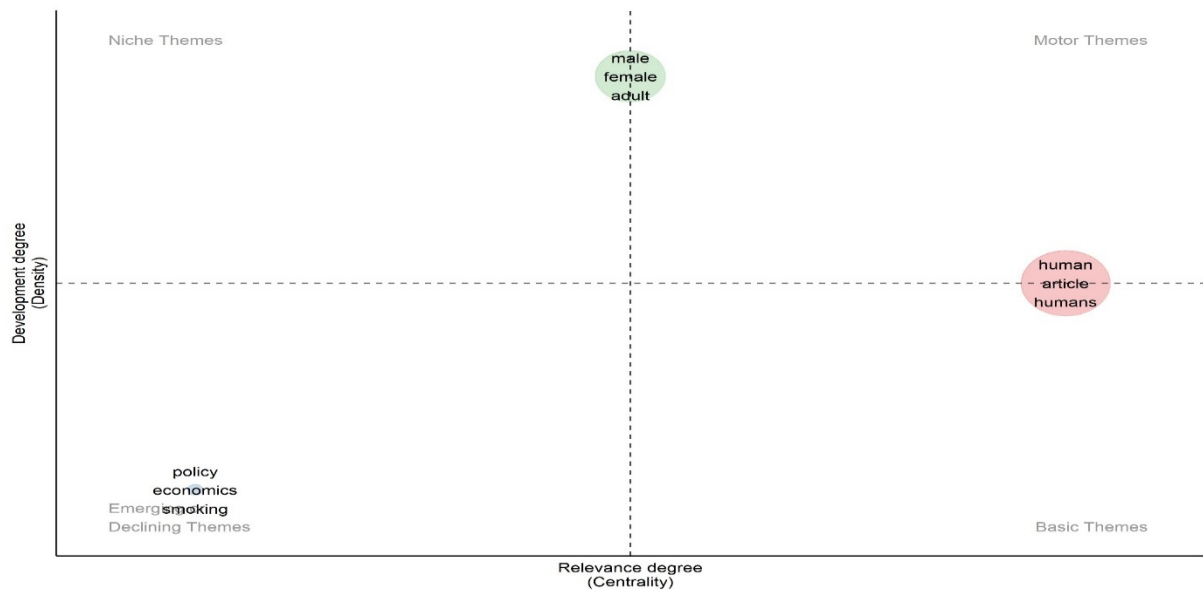


Figure 11. Thematic Map Theme Map

In the literature, the words “human, article, humans” as the basic theme and “male, female, adult” as the motor theme are still used. It was found that the words “male, female, adult” as the nich theme and “policy, economics, smoking” as the 3 square themes are still used.

Trending topics

The most important words in the articles on sports law in the literature between 1906 and 2024 are given in Table 3.

Table 3. Most Important Keywords

item	freq	year_q1	year_med	year_q3
human	737	2003	2014	2020
article	579	2005	2013	2020
male	507	2007	2015	2020
humans	449	2009	2015	2020
female	412	2008	2015	2020
sports	328	2013	2016	2021
sport	321	2008	2016	2021
law	209	1995	2008	2018
sport injury	197	2003	2014	2019
united states	193	2002	2013	2017

The word “man” appears 737 times in the literature, making it the most frequently used word in the first quarter of 2003, the second quarter of 2014, and the third quarter of 2020. The word “article” is mentioned 579 times, ranking as the second most frequently used word in the first quarter of 2005, the second quarter of 2013, and the third quarter of 2020. The word “male” is cited 507 times and is the third most frequently used word in the first quarter of 2007, the second quarter of 2015, and the third quarter of 2020.

keyword groups in the 2012-2020 period. It can be said that keywords such as “concussion, governance, covid-19, public health, compliance” are also widely used in the literature.

DISCUSSION AND CONCLUSION

In this study, a bibliometric analysis was conducted on works within the field of sports law, focusing on parameters such as authors, references, works, countries, universities, keywords, and collaborations, as well as the relationships between these factors. The literature review revealed a consistent increase in publications related to sports law. The research utilized the Scopus database, where articles from 2,000 journals were filtered and downloaded. The findings indicated that the average age of the articles was 11.2 years, and the average number of citations per document was 11.87. Of the 5,388 authors identified, 718 published independently, while the remaining 4,670 publications were co-authored. Lapa and Köse, in their 2021 bibliometric analysis of leisure, observed that articles were predominantly authored by pairs of researchers (Lapa & Köse, 2021). Erbil, in his 2023 study on core training, noted that most publications in this area involved multiple authors, with an average of four researchers per article (Erbil, 2023). This pattern of co-authorship is typical across various scientific disciplines.

In terms of collaboration, the rate of international co-authorship was found to be 11.39%. Spain exhibits the lowest level of collaboration. In a 2013 bibliometric study, Tekneci identified Turkey as the country with the least collaboration among the eight countries studied (Tekneci, 2013). As most of the articles in our study are open access, numerous authors have become involved as the topic has evolved and the articles have been widely disseminated. An examination of the literature indicates that the United States of America, the United Kingdom, and Australia are the countries that contribute the most to the sports law literature.

According to the Sankey diagram, the USA is the most productive country. In a 2013 study on sports in Turkey, Tekneci reported that the United States of America significantly leads in the number of sports-related publications compared to other countries (Tekneci, 2013). This leadership is attributed to the high number of researchers in the USA and its pioneering contributions across many scientific fields. In their 2020 bibliometric analysis on the concept of e-sports, Büyükbaykal and İli identified the USA and China as the countries with the highest publication volumes (Büyükbaykal & İli, 2020), indicating that these countries are quickly adapting to research in the sports field.

The most significant author in this research was identified as “Yang, J.” In a bibliometric analysis of teaching methods in physical education and sports, Dalkıran and Uysal (2024) found that Mark Byra was the most prolific researcher (Dalkıran & Uysal, 2024). Similarly, Genç et al. (2022) determined that Steve W. Selin led the rankings in their bibliometric analysis of outdoor recreation in 2022, with four studies (Genç et al., 2022).

The most frequently repeated word in this research is “doping.” In a bibliometric study by Öner and Murathan on attitudes toward the physical education and sport program, the keyword “physical education and sport” was most commonly used (Öner & Murathan, 2023). Similarly, in the 2022 bibliometric analysis by Baytur and Ulaş on the physical education model, the keywords “physical education and physical activity” were the most frequently used (Baytur & Ulaş, 2022). The topic of doping has consistently played a significant role in the development of sports law globally. Given that doping is classified as a crime within the history of sports, its frequent mention in legal studies is expected.

In our research, the most productive document is “Effect of Aging and Physical Activity on Left Ventricular Compliance” by Zadeh et al. (2004). The most cited journal is the “National Library of Medicine.” In Öner’s 2022 bibliometric study on sports injuries, the “Journal of Applied Sport Psychology” emerged as the journal with the highest number of publications, featuring 27 research articles (Öner, 2022). The frequent citation of sports law articles in a medical journal underscores the intersection of legal issues with sports injuries within the realm of sports law.

According to the study, Stellenbosch University is the leading institution in terms of producing and publishing research on sports law among universities. In a bibliometric analysis of physical activity conducted by Güler in 2023, the University of British Columbia was identified as the institution with the highest number of publications (Güler, 2023). Similarly, a 2023 bibliometric analysis on leadership in sport by Akpınar found that Loughborough University conducted the most studies in this area (Akpınar, 2023). In his 2022 study on sports injuries, Öner noted that Springfield University and Halmstad University, which have the most publications, have shown remarkable progress (Öner, 2022). Stellenbosch University, located in South Africa, is active in various fields including arts and social sciences, business and management, education, law, and medicine and health sciences. The productivity of its Faculty of Law may have contributed to this achievement.

In this study, the most important keywords used in the literature are summarized as a result of the factor analysis in the red cluster “laws, athlete, sport, incidence, physical”. The second most frequently used words in the literature are summarized in the blue cluster “human, male, major, traffic, young”. In his bibliometric study in the field of sports tourism in 2022, Çetiner stated that in recent years, “event, marketing, hunting, culture” were mainly examined and that there has been a trend towards “consumer behavior and sustainability” in recent years (Çetiner, 2022). In our study, there is a tendency that the use of the terms “laws, athletes, sports, events, physical” will gradually increase. This result is important to show the direction in which sports law has developed.

In the analysis conducted to determine the themes used in the key words in the literature, it was found that the words “athletes, brain, consultation, legislation” were used as active themes. The words “male, female, adult” were used as motor themes. The words “male, female, adult” were used as non-topics. The words “politics, economy, smoking” are still used as 3 square themes. The word “man” is the most repeated word in the literature. It is the most frequently used word in the first quarter of 2003, the second quarter of 2014 and the third quarter of 2020”.

In this study, we examined worldwide scientific publications in the field of sports law using data from the Scopus database. Our analysis identified the most productive researchers, countries, institutions, keywords, and topics in the literature. We created maps based on these distribution frequencies and generated tables and figures. The United States of America emerged as the most productive country in terms of the number of articles. “Yang J” was found to be the most prolific author. The most frequently cited journal for publications on sports law is the “National Library of Medicine.” The primary keywords used by the authors were “sports, concussion.” We believe that this comprehensive study in sports law will guide the rapidly developing field of sports in various aspects and perspectives. The results reflect the current state of sports law research and provide a reference point for researchers, offering a deep understanding of the field. The identified gaps in the literature and potential research directions will assist professionals, academics, and students in shaping their future studies in sports law.

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CONTRIBUTION RATE	EXPLANATION	CONTRIBUTORS
<i>Idea or Notion</i>	<i>Form the research hypothesis or idea</i>	Gulsum AKER Zuhal YURTSIZOGLU
<i>Design</i>	<i>To design the method and research design.</i>	Gulsum AKER Zuhal YURTSIZOGLU
<i>Literature Review</i>	<i>Review the literature required for the study</i>	Gulsum AKER Zuhal YURTSIZOGLU
<i>Data Collecting and Processing</i>	<i>Collecting, organizing and reporting data</i>	Gulsum AKER Zuhal YURTSIZOGLU
<i>Discussion and Commentary</i>	<i>Evaluation of the obtained finding</i>	Gulsum AKER Zuhal YURTSIZOGLU
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