The Educational Review, USA, 2022, 6(8), 334-340
https://www.hillpublisher.com/journals/er/
ISSN Online: 2575-7946
ISSN Print: 2575-7938

Exploration and Analysis of Research Hot Topics in "Sports Science" Journal-Based on Cite Space V Knowledge Graph Measurement Analysis

Weijia Song[1], Yinghai Liu[2,3,*], Wei Yang[2,3,*]

[1]Raymond National University of Marseilles, the Philippines.
[2]Shanxi University School of Physical Education, Taiyuan, Shanxi, China.
[3]Suzhou College, Suzhou, Anhui, China.

How to cite this paper: Weijia Song, Yinghai Liu, Wei Yang. (2022). Exploration and Analysis of Research Hot Topics in "Sports Science" Journal-Based on Cite Space V Knowledge Graph Measurement Analysis. *The Educational Review, USA*, 6(8), 334-340.
DOI: 10.26855/er.2022.08.002

Received: June 16, 2022
Accepted: July 12, 2022
Published: August 15, 2022

Corresponding author: Yinghai Liu, Wei Yang, Shanxi University School of Physical Education, Taiyuan, Shanxi, China; Suzhou College, Suzhou, Anhui, China.

Abstract

In this paper, bibliometric method is used to analyze the articles recorded in the core journals of "Sports Science" taking CNKI as an example, and Cite SpaceV software is used to analyze the high-yield institutions, authors and keywords of article production in the core journals of "Sports Science" from 2010 to 2020. The intuitive and clear research shows that the core journals of sports science in the past 10 years have been the research hotspots and the system between various disciplines, and put forward the development conclusions of sports science research. Although the research frontier is diversified, it is still the key to strengthen the development of competitive sports, improve the research level, solve the current hot issues, and strengthen the research of national traditional sports and sports humanities and sociology. In other words, the development prospect of the "Sports Science" journal is bright, and more well-known scholars are still needed to develop their own research fields and improve the quality of "Sports Science" articles.

Keywords

Bibliometrics, CNKI, Sports Science, Cite Space V, Collinear Graph

In 1981, Sports Science was founded. The database contains journals. In order to quickly grasp the hot content, themes and dynamic trends of current research in the core journals of "Sports Science", examine the current frontier trends in sports research. Based on the relevant sports articles included in the Chinese Sports Science Citation Index (CNKI) database from 2010 to 2020, this paper uses the Cite Space V software to visually analyze the relevant literature of the CNKI platform "Sports Science" in the past ten years. Identify the research frontiers such as authors, institutions, topics and keywords, analyze the power distribution of sports discipline research, probe the subject knowledge base, conduct a comprehensive and scientific review of the future development of my country's sports field, and conduct research on its follow-up development. Think accordingly.

1. Research methods and data processing

1.1 Methods of research

Cite Space is a JA-VA platform developed by Dr. Chaomei Chen from Dresser University and Dalian University of Technology. It is used to identify the data in the literature and display thetrend of scientific research development and dynamic visual analysis. Cite Space software draws a "knowledge map" by extracting the author, institution, key word and other information in the literature data, and analyzes the research from various aspects from the extraction of in-

formation Field dynamics, hot content and trend orientation. Based on this, this study uses Cite Space visualization analysis software, and uses bibliometric and visual analysis methods to draw knowledge maps and visualize 849 retrieved documents from the core journals of "Sports Science" in my country from 2010 to 2020. Statistics and analysis can comprehensively and scientifically examine the development direction of "Sports Science" in the past 10 years and the research hotspots, themes and dynamic trends in the field of sports in recent years.

1.2 Data sources and processing

In this study, CNKI (Chinese Journal Full-text Database) was used to search the data source for advanced search, with "Sports" as the subject word and "Sports Science" as the literature source, and the literature retrieval time span was from January 1, 2010 to December 2020. On the 24th, 923 relevant documents were retrieved, and through secondary screening of advertisements, conferences, papers and other documents, a total of 849 target documents in the past 10 years were retrieved (as shown in Table 1).

Table 1. Research data sources

Title content	
Data source	CNKI (Chinese Journal Full-text Database) Search Format Subject = "Sports" AND "Sources" = "Sports Science"
Time Span	2010-2020
Search data	923 journal articles
Valid data	849 journal articles

2. Text Mining and Visual Analysis of Journal Research of "Sports Science"

2.1 Basic Statistic

After screening, the 849 target documents were processed according to the reference format (Refworks) required by Cite Space and imported into Cite SpaceV software. "Title (title)" "Abstract (abstract)", "Author Keywords (keywords)" "Keywords Plus (supplementary keywords)", the rest of the options keep the default settings, and then select in Note Types (node type) as required "Author (author)", "Institution (institution)", "Key-word (keyword)" and other content, and draw maps and measurement data.

2.2 Institutional identification and core author groups

The document issuing institution is the backbone of sports research. The distribution of institutions can show the spatial distribution characteristics, influence and cooperative relationship of the research fields of the core journals of "Sports Science". In order to clarify the distribution relationship between them, this study uses Cite Space software to import the processed data into Cite Space, selects the time span from 2010 to 2020, the time slice is 1, that is, 1 year is a time zone, and the threshold is tope =50, select the institution as the node type, and select the default values for the rest of the parameters. Click "Go" to perform visual analysis, and obtain the number of nodes in the knowledge graph of the research institution N=229, the number of connections E=277, and the density Density=0.0044. Institutions with more publications have larger nodes in the graph. As shown in Table 1, through the statistics of journal publishing institutions, the top 10 are ranked according to the publication volume from large to small. The main publishers of "Sports Science" articles are from The State Sports General Administration, Shanghai Institute of Physical Education, Beijing Sports University, East China Normal University School of Sports and Health, South China Normal University Sports Science College and other institutions, as can be seen from Figure 1, the State Sports General Administration, Shanghai Institute of Physical Education, Beijing Sports University, East China Normal University, etc. School of Physical Education and Health of Normal University, School of Physical Education of South China Normal University, School of Physical Education of Ningbo University, School of Physical Education and Training of Shanghai Institute of Physical Education, East China Normal University, School of Physical Education of Soochow University, School of Physical Education of Fujian Normal University, these institutions have relatively large nodes, and published papers The larger the volume, the greater the impact. From the cooperation context of various institutions in Figure 1, it can be seen that the State Sports General Administration, Shanghai Institute of Physical Education, Beijing Sports University and other institutions have a relatively high volume of publications, and are closely linked with the cooperation context of other institutions, forming a large-scale cooperative research group in the long-term development process. While the vast majority of institutions such as East China Normal University School of Physical Education and Health, South China Normal

University School of Sports Science, Ningbo University School of Physical Education, Shanghai Institute of Physical Education School of Physical Education and Training, East China Normal University, Soochow University School of Physical Education, Fujian Normal University Sports Science The colleges and other institutions have formed a small-scale cooperative research group. In addition, although some institutions have a high volume of publications, they are fighting alone; the density of cooperative research institutions related to "Sports Science" is only 0.0044, indicating that most institutions are not closely connected and cooperate with each other. Weak consciousness makes it difficult to form a broad and stable research context group.

Table 2. Statistics on the number of papers issued by research institutions

serial number	mechanism	Post volume
1	Institute of Sports Science, General Administration of Sport of China	40
2	Shanghai Institute of Physical Education	40
3	Beijing Sports University	40
4	School of Physical Education and Health, East China Normal University	30
5	School of Sports Science, South China Normal University	30
6	Ningbo University School of Physical Education	29
7	School of Physical Education and Training of Shanghai Institute of Physical Education	27
8	School of Physical Education, Central China Normal University	26
9	Soochow University School of Physical Education	22
10	School of Sports Science, Fujian Normal University	20

The graph analysis of the research authors can intuitively understand the number of papers published by experts in the relevant research fields and the cooperation in the relevant research fields. By using the Cite SpaceV software for this article, set the node type (Note types) to the author (Author), and other setting parameters are default. Value, run the cite space software to obtain the collinear graph of the research authors, the number of nodes (N=310), the number of connections (E=299), and the density (Density=0.0048). The author nodes with more publications in the graph will be larger, and the scientific research ability will be stronger. In the graph, Wang Jian has the largest node, while Cong Huping, Zhou Chenglin, Liu Huina and others have smaller nodes. Generally speaking, these high-yield authors are well-known scholars in related research fields, and their influence is relatively large.

As shown in Table 3, the authors with the top 10 published papers are arranged in order, namely Cong Husheng (7 papers), Wang Jian (7 papers), Zhou Chenglin (5 papers), Liu Huina (4 papers), Jiang Xi (4 papers), Tan Guangxin (3 articles), Zhao Jiexiu (3 articles), Wang Jin (3 articles), Feng Baoxin (3 articles), Shang Wenyuan (3 articles). Combining (Table 3), it can be seen that three people, such as Shang Wenyuan, Feng Baoxin, Zhao Jiexiu, Zhou Chenglin, Liu Huina, etc., have formed a small scientific research group. During the research process, researchers in the same field will inevitably have some cooperation. With a certain cooperation network, the mutual matching among scholars forms an overall context. Through these contexts, we can clearly see the cooperative relationship of the core authors in the field. The density value of 0.0424 indicates that the degree of cooperation among these well-known scholars is not high, which generally takes the form of a "solitary operation". The key research fields of the core authors can be determined through accurate analysis of the papers published by the core authors, and it also represents the research upsurge in some frontier fields, which makes the articles published in "Sports Science" of high quality and shows its authority.

Table 3. Statistics of the number of articles published by research authors

serial number	author	Post volume
1	Cong Huping	7
2	Wang Jian	7
3	Zhou Chenglin	5
4	Liu Weina	4
5	Jian Gxi	4
6	Tan Guangxin	3
7	Zhao Jiexiu	3
8	Wang Jin	3
9	Feng Baoxin	3
10	Shang Wenyuan	3

2.3 Analysis of research hotspots

Keywords are the condensed and condensed expressions of the article. In-depth analysis of keywords can clearly and intuitively understand the central content of the article. Through the frequency statistics and centrality analysis of the number of keywords, we can clearly understand the research hotspots in this field in a certain period of time (Li Ruiqi & Wang Xiangrong, 2020). According to the graph theory concept of the importance of the centrality vectorized point in the network, the larger the centrality value, the more critical the node is Hu Jinping and Lu Rui (2020). Import the data into Cite Space, set the network node as the keyword (Key-word), select the threshold (C, CC, CCV) as (2.2.20; 4.3.20; 4.3.20), and set the rest to the default values, by running "The collinear situation of keywords in the journal Sports Science in the past 10 years" shows the hot topics in the relevant research fields in the past 10 years. The graph contains 91 nodes and 90 connecting lines, which means that there are 91 keywords with more than twice the frequency of connecting lines. The module value (Q value) in the graph is 0.7915, which is quite significant; the density is 0.022, indicating that in the past 10 years of research, the relevant research hot topics are not closely related and relatively scattered. In addition, "China", "sports", "martial arts", and "mass sports" in the map are the three most frequently occurring keywords, and they are also the hotspots of the current theme foreword. More and more Chinese sports have attracted more and more attention. Multidisciplinary and interdisciplinary comprehensive research is more advantageous and tends to be the mainstream of current research.

On the basis of the keyword collinearity map, it is further concluded that the keyword collinearity clustering network map. The keyword clustering analysis is based on the keyword collinearity analysis, and the keyword collinearity network is simplified by the method of clustering statistics. into relatively few clustering processes(Miao Xiaoyan & Zhang Chong, 2018). Through keyword clustering analysis on the literature of sports science journals in the past 10 years, the foreword trend of "Sports Science" journals in related research fields is explored. Run the Cite Space V software, set the node type as keyword, select the threshold as the default value, and other settings are consistent with the institutional parameters, select the LLR algorithm on the basis of the keyword collinear network map, and obtain the keyword clustering shown in Table 4 network graph. In the figure, there are 9 key words aggregated, including "youth", "research paradigm", "athletes", "stadium", "development", "sports industry", "reform and opening up", "industrialization" and "law revision". In other words, these 9 clusters further reflect the research hotspots and trends of "Sports Science" in the past 10 years. Through cluster analysis, it is found that in the research hotspots of sports science journals in the past 10 years, the content of each clustering research overlaps each other, indicating that each research field is infiltrated and interconnected.

Table 4. Keyword frequency and centrality statistics (keywords with centrality ≥ 0.05)

serial number	Keywords	Frequency	Centrality
1	China	62	0.35
2	physical education	47	0.17
3	athlete	34	0.14
4	sports industry	34	0.06
5	competitive sports	26	0.19
6	teenager	19	0.11
7	school sports	18	0.05
8	physical activity	15	0.05
9	professional sports	14	0.05
10	New Era	8	0.06
11	policy	6	0.05
12	feature	4	0.05
13	Listed company	3	0.05

From the list of keywords with centrality≥0.05 in Table 4, it can be seen that keywords with centrality close to 0.1 have high intermediary nodes. Combined with Table 4, it can be concluded that "China" has the highest frequency (62), and The centrality (0.35) is the strongest, among which, the centrality of "sports" (0.17), the centrality of "athletes" (0.14), the centrality of "competitive sports" (0.19), and the centrality of "teenagers" (0.11), all of which are Nearly 0.1 high intermediary keywords are also the research topics of current sports science journal articles for nearly 10 years. In

addition, there are sports industry (34; 0.06), school sports (18; 0.05), physical activity (15; 0.05), occupation although the frequency of sports (14; 0.05) is high, the centrality is low. There is no doubt that they are also the hotspots of the "Sports Science" journal in the past 10 years. The field of sports must intersect and integrate with other comprehensive professional fields. In order to establish a sound research system. For example, although the sports industry and school sports have been research hotspots in the past few years, they have laid a solid foundation for the research in the field of sports, which has made the quality of articles in the journal "Sports Science" higher and higher, and the scope of radiation has become wider and wider.

2.4 Evolution path analysis of research hotspots

Emerging words represent keywords that suddenly increase the frequency of citations at a certain stage, and can be used to reflect the research trends and hotspots in a certain stage. Based on this, in order to further study the development trend of the core journals of "Sports Science", this paper uses the "Burstness" function of Cite Space, and sets the parameter r to ensure that the keywords will emerge continuously and repeatedly verify from 2010 to 2020, so as to ensure its research Continuity of features, set the parameter Minimum Duration to 1 year to get the keyword emergence graph (as shown in Figure 1).

Figure 1. Keyword emergence diagram.

It can be seen from the figure that the emergent time was earlier in 2010-2012, and the emergent word was "China"; the emergent word during 2012-2014 was "youth"; the emergent word during 2014-2017 was "national fitness" In August 2016, General Secretary Xi Jinping clearly stated at the National Health and Health Conference: "People's health is in a strategic position in national development, establish the concept of 'big health', and deeply integrate national fitness and national health." In October of the same year, the State Council issued the "Healthy China 2030" Planning Outline, and national fitness has become a research hotspot at the current stage. During the period of 2015-2017, the prominent words were "public sports services"; during the period of 2016-2018, the prominent words were "school sports" and "physical education". In October 2016, the "Healthy China 2030" Planning Outline clarified. It is proposed that health education should be an important part of quality education and be incorporated into all school education stages to strengthen students' all-round development of morality, intelligence, physique, beauty and labor. During 2016-2017, the prominent words were "Healthy China" and "America". In October 2017, in the report of the 19th National Congress of the Communist Party of China, General Secretary Xi Jinping once again proposed: the extensive development of national fitness activities will promote the construction of a strong sports country and a healthy China. Construction will be given priority to development, and "national fitness" will be the top priority during this period. From 2018-2020, the emergent word is "New Era". Among them, the prominent words "National Fitness", "Healthy China" and "Public Service System" have continued to this day, indicating that the three are the current research hotspots in the field.

In addition, the keyword timing map can also be used to reflect the evolution of a certain period of time. Run the Cite Space software, based on the collinear knowledge map of keywords, set the parameter to Timezone View to obtain the keyword timing map. The location of each node in the graph is the year of their appearance, the size of the node represents the number of times the keywords appear in the "Sports Science" journal, and the lines between the nodes represent the collinearity between the keywords in the "Sports Science" journal relation (Wei Ruibin, 2011).

The keywords in the figure have different themes at different times. Therefore, the research evolution of the "Sports Science" journal can be divided into three parts, namely 2010-2012, 2013-2017, 2018-2020, so that more A good analysis of the research development and evolution of the core journals of "Sports Science".

1) The first stage, the development and exploration stage of "Sports Science" (2010-2012). The evolution path of knowledge development in the journal "Sports Science" is relatively clear. From 2010 to 2012, many research themes can be seen, including "sports", "China", "sports competition", "sports industry", "youth", "students", etc., these are the hot topics of the "Sports Science" journal keywords in this stage. In addition, these hot topics are often mentioned in the later stage. For the topics with smaller nodes, such as "sports power", "sports power" Consumption, "physical exercise", "middle school students", "professional sports", "sports arbitration" and other lesser research topics are relatively cutting-edge research topics at this stage, and can also be called "sub-hot topics". It can be seen that the prominent word in 2010-2012 is "China", which indicates that the number of "China" mentioned suddenly increased at this stage, and the research problems related to Chinese sports are the main goals to be solved in this stage. One, through the analysis of the knowledge evolution path, the sports industry and Chinese sports have formed a key word collinearity, which indicates that researchers have also carried out researches on the problems of my country's sports itself. Although "sports industry" is one of the key collinear words with "Chinese sports". First, "sports industry" is closely related to "sports economy" and "sports consumption". The economic issue of China's sports industry is definitely a hot topic in my country's sports science research.

"Sports Science" is a core journal in Chinese and a core journal in Chinese humanities and social sciences. There will be many problems in the limitation of literature, various scientific research levels, personnel, etc. For authors and institutions, if the scientific research ability is insufficient, it will lead to the number of publications in sports science has decreased, so there will be restrictions on individual and institutional publications at this stage (Wang Qi, 2012).

2) The second stage, the prominent stage of the development of "Sports Science" journal (2013-2017). The period from 2013 to 2017 is a prominent stage of the development of sports science journals. On the one hand, the research hot topics in this stage are "youth", school sports, national fitness, public sports services, etc., combined with the keyword emergent graph, we found that "youth", "national fitness", and "public sports services" are high-frequency emergent words. In other words, in the development process of sports science research, "youth sports" and "national fitness" are the current research hot topics in this field. On the other hand, the policy orientation, in August 2016, General Secretary Xi Jinping clearly stated at the National Health and Health Conference: "People's health is in a strategic position in national development, and the concept of 'big health' should be established to integrate national fitness and national health". In October of the same year, the State Council issued the "Healthy China 2030" Planning Outline, and national fitness has become a research hotspot at the current stage. In October 2016, President Xi Jinping of the "Healthy China 2030" Planning Outline also clearly proposed that health education should be an important part of quality education, included in all school education stages, and to strengthen students' comprehensive development of morality, intelligence, physique, aesthetics and labor (Dai Shengting, Yang Jian, Liu Wei, & Ji Liu, 2018).

During this period (2013-2017), the number of articles published in "Sports Science" has gradually increased, but the existing problems have become increasingly prominent, and the research direction has gradually begun to show diversification.

3) The third stage, the new period of "Sports Science" (2018-2020). At this stage, with the continuous development and improvement of sports science journals, the research topics are based on the environment of media integration, and hot research topics have emerged one after another. Although the focus of the fields is generally different, all aspects are closely related. As shown in the key sequence diagram in Figure 6, in the new era, the keyword nodes of "New Era" and "Sports Law" are more obvious. Combined with the keyword emergence diagram, we can see the new era stage, and "New Era" and "Sports Law" have become the current research topics are hot, with the changes in scientific research level, research hot topics, publishing institutions, and personnel levels, the quality and volume of articles published in the core journals of "Sports Science" also increase. The in-depth analysis of the new period of the "Sports Science" journal, the core journal of "Sports Science" belongs to the arrival of a new era at this moment.

3. Conclusion and Outlook

3.1 Conclusion

Through research and analysis of the core journals of "Sports Science", it is found that:

The research fields of Chinese sports science journals include competitive sports, mass sports and school sports. The research content of competitive sports design includes competitive sports management, competitive sports development, and competitive sports training. The research content of popular sports includes national fitness and community sports. ,

sports consumption, sports industry, physical exercise, etc.; school sports research concentration includes physical education, physical education, etc.

First, judging from the high-yield institutions of the “Sports Science” journal, there is a large difference in the number of publications among various institutions. Except for some well-known institutions that have close cooperation and ties, the number of connections between other institutions is small, and most institutions are in the “Working alone” and lack of cooperation with other agencies. Institutions should strengthen the awareness of cooperation, share their experience in the field of scientific research, and promote the quality of publications in Sports Science journals; from the perspective of the core author groups of sports science journals, scholars who publish more papers will have less cooperation in the field of research, indicating that scholars in various fields of sports research lack the sense of cooperation, and the research scope is relatively shallow and relatively single. Therefore, researchers in various fields should strengthen cooperation and exchanges, so that multiple disciplines intersect and integrate with each other, and promote the “Sports Science” Comprehensiveness and comprehensiveness of articles in core journals.

Second, from the perspective of the research hotspots and evolution of the core journals of “Sports Science”, the key themes of sports science journals in the past 10 years are around “youth”, “research paradigm”, “athletes”, “stadium”, “development”, “sports industry”, “reform and opening up”, “industrialization”, “law revision”, these are the hot topics of research in the past 10 years, indicating that these aspects are still one of the main problems to be solved at present. Therefore, in the future, we should pay more attention to adolescent health issues, respond to the call of national policies, and promote the development of youth sports; strengthen the development of the sports industry, promote industrial consumption, fundamentally improve the development of sports science research, improve the comprehensive level of various research fields, and promote the "Sports Science" journal Content self-improvement.

3.2 Outlook

Relying on the special cultural background and cultural tradition, it is necessary to strengthen my country’s sports scientific research, and use high-tech multimedia technology to carry out characteristic sports scientific research, so that my country’s sports scientific research can obtain corresponding high-level research results with characteristics. In addition, although the research frontier is diversified, it is still the key to strengthen the development of competitive sports, improve the research level, solve the current hot issues, and strengthen the research of national traditional sports and sports humanities and sociology. In other words, the development prospects of “Sports Science” journals are bright, and more well-known scholars are still needed to develop their own research fields and improve the quality of “Sports Science” articles.

References

Dai Shengting, Yang Jian, Liu Wei, and Ji Liu. (2018). Visual analysis of the evolution of Chinese exercise psychology research. *Journal of Wuhan Institute of Physical Education*, 52(07), 75-81. doi:10.15930/j.cnki.wtxb .2018.07.012.

Hu Jinping and Lv Rui. (2020). Analysis of Hot Topics and Trends in the Research of Hearing Impaired College Students in my country: Visual Analysis Based on Knowledge Graph %J. *Journal of Suihua University*, 40(01), 43-47.

Li Ruiqi and Wang Xiangrong. (2020). Analysis of domestic core stability research situation based on Cite Space V %J. *Youth Sports*, (06), 121-122.

Miao Xiaoyan and Zhang Chong. (2018). Hotspots and Development Trends of Moral Education Integration Research in Universities, Middle Schools and Primary Schools: A CITESPACE Analysis Based on CNKI Database %J. *China Special Education*, (08), 85-90.

Wang Qi. (2012). Hot areas and subject systems of sports science research in my country—Based on the knowledge map analysis of key words and co-words in “Sports Science” 2000-2010%J. Journal of Hebei Institute of Physical Education, 26(03), 21-24.

Wei Ruibin. (2011). Visual Analysis of Domestic Knowledge Graph Research %J. *Library and Information Work*, 55(08), 126-130.