

Knowledge Graph Analysis of Chinese Sports Spirit

Authors: Hua Zhengwei, Hua Zhengwei

Date: 2024-06-03T00:00:00+00:00

Abstract

In-depth research on the Chinese sports spirit contributes to the continuation of the red sports heritage, consolidates the spiritual strength for the great rejuvenation of the Chinese nation, and holds significant contemporary value and practical significance for accelerating the strategic goal of building a sports powerhouse. By employing bibliometric methods and CiteSpace software to analyze and organize CNKI literature data, this study systematically elucidates the current status, hotspots, pathways, and development trends of academic research on the Chinese sports spirit. Research on the Chinese sports spirit has established a basic paradigm characterized by continuity and persistence, orientation and practicality, diversity and high citation rates, yet it also exhibits certain limitations and fragmentation. Collaborative advancement of systematic research on the Chinese sports spirit from multiple subjects and multi-dimensional perspectives is required.

Full Text

Preamble

Research on the Spirit of Chinese Sports: Current Status, Hotspots, and Prospects—An Analysis Based on CNKI Academic Journal Literature

Abstract: An in-depth study of the spirit of Chinese sports helps carry forward the “red” sports genes and consolidate the spiritual power for the great rejuvenation of the Chinese nation, holding significant contemporary value and practical significance for accelerating the strategic goal of building a powerful sports nation. Using bibliometric methods and CiteSpace software, this paper systematically elucidates the current status, hotspots, pathways, and development trends in academic research on the spirit of Chinese sports through analysis and organization of CNKI literature data. Research on the spirit of Chinese sports has

formed a basic paradigm characterized by continuity and persistence, guidance and practicality, diversity and high citation rates, yet it also exhibits certain limitations and dispersion. Systematic research on the spirit of Chinese sports requires collaborative advancement from multiple entities and multidimensional perspectives.

Keywords: Spirit of Chinese Sports, Knowledge Graph, Hotspot Matrix, Development Trend

Author: Hua Zhengwei (School of Sports Science, Shenyang Normal University, Shenyang 110034)

Received Date: [Not provided]

Author Biography: Hua Zhengwei (1967-), male, professor, master's supervisor. Research direction: Sports humanities and sociology. Affiliation: School of Sports Science, Shenyang Normal University, Shenyang 110034.

1. Introduction

The concept of the “Spirit of Chinese Sports” as a specific term originated from a series of articles published in *China Sports Daily* in 1996. In the same year, leaders of the former State Sports Commission formally proposed the concept. On October 3, 2000, Comrade Jiang Zemin explicitly stated during his meeting with the Chinese Olympic delegation at the Sydney Olympics: “The spirit of Chinese sports constitutes an important component of our socialist spiritual civilization and represents the precious spiritual wealth of the Chinese nation” [1]. This marked the first clear elaboration of the spirit of Chinese sports by party and state leaders and signified its comprehensive formation. In recent years, General Secretary Xi Jinping has provided important elaborations on the spirit of Chinese sports, emphasizing that “the spirit of Chinese sports, summarized by vast numbers of sports workers through long-term practice with its main content of ‘striving for national glory, selfless dedication, scientific realism, law-abiding discipline, solidarity and cooperation, and tenacious struggle,’ has not come easily and is extremely precious. It must be inherited, innovated, and carried forward” [2]. The resolution adopted at the Sixth Plenary Session of the 19th Central Committee of the Party, *Resolution of the Central Committee of the Communist Party of China on the Major Achievements and Historical Experience of the Party’s Centennial Struggle*, emphasizes “accelerating the building of a powerful sports nation, extensively carrying out national fitness activities, and vigorously promoting the spirit of Chinese sports” [3]. These developments have ushered research on the spirit of Chinese sports into a new stage. Based on the CiteSpace visualization tool and the CNKI journal full-text database platform, this paper selects literature with the theme of “spirit of Chinese sports” and employs bibliometric methods to systematically analyze the research status, hotspots, and evolutionary paths of studies on the spirit of Chinese sports, thereby better responding to the source of strength and practical needs for building a powerful sports nation in the new era and providing a referential and

operational paradigm for advancing in-depth research on the spirit of Chinese sports.

2. Research Design

2.1 Data Sources

According to research requirements, this paper utilizes the CNKI journal full-text database as the data source, conducting an advanced search with “spirit of Chinese sports” as the subject term on July 1, 2023. The search yielded 355 documents. To enhance data precision, scientific rigor, and correlation density, this paper selects only academic journal articles as the analytical dataset. Therefore, by browsing the titles and abstracts of search results, duplicate data, conference reviews, news articles, institutional and personal publicity materials, and other less relevant documents were excluded. Ultimately, 313 highly relevant documents on the “spirit of Chinese sports” were selected as the effective sample for this study.

2.2 Research Methods

This paper employs bibliometric methods and knowledge graph visualization analysis to conduct quantitative and visual analysis of the sample literature on the spirit of Chinese sports. The tool selected for knowledge graph mapping is CiteSpace v6.1 software, configured with the following specific parameters: G-index = 25, LRF = 3, L/N = 10, LBY = 5, $e = 1.0$, Slice Length = 1. By extracting data information from CNKI literature with the theme of “spirit of Chinese sports” and using authors, institutions, and keywords as nodes, the software enables visual analysis of annual publication volume, publishing journals, research institutions, disciplinary structure, author distribution, and co-occurring keywords. This facilitates the construction of a multidimensional analysis model that clearly reveals the thematic hotspots and developmental trajectory of research on the spirit of Chinese sports. This study analyzes relevant literature published between 1996 and 2023 (as of July 1, 2023) and their distribution across different time periods. Simultaneously, CSSCI-indexed journals are selected as an important reference for bibliometric analysis, aiming to leverage high-quality literature to enhance analytical efficiency and effectiveness and to better grasp the cutting-edge dynamics of academic research on this theme.

3. Knowledge Graph Analysis of Research on the Spirit of Chinese Sports

Through knowledge graph visualization analysis of annual publication volume, journal sources, disciplinary structure, research institutions, authors, and keyword co-occurrence, this paper provides a comprehensive review of the overall status, hotspot matrix, and evolutionary trends of research on the spirit of Chinese sports, offering descriptive predictions for future research.

3.1 Analysis of Overall Trends in Annual Publication Volume

Based on the annual line chart of publications on the spirit of Chinese sports from CNKI (as shown in Figure 1 [Figure 1: see original paper]), the 28-year trend intuitively reflects the annual changes and overall research trajectory of academic literature on this theme. Research on the spirit of Chinese sports emerged sporadically beginning in 1996, but remained limited between 1996 and 2005, with an average annual output of only 3.8 articles, with most years producing just a single publication. From 2006 to 2015, publication volume grew rapidly, reaching an annual average of 10.1 articles, with CSSCI-indexed papers showing positive growth. Between 2016 and 2022, publication volume continued to increase, with an annual average of 17.2 articles, peaking dramatically in 2022 with 50 publications. In the first half of 2023 (as of July 1), 22 articles were published, suggesting that the total for 2023 will likely reach approximately 50 articles as well. Evidently, domestic academia has increasingly prioritized research on the spirit of Chinese sports, which has become a hot topic in scholarly inquiry. The explosive growth in 2022 indicates that research in this field is experiencing a “golden period,” attracting growing exploration and academic debate among scholars.

As shown in Figure 1, two active periods and three peaks have emerged during the academic study of the spirit of Chinese sports. The first active period concentrated primarily in 2008–2009, during which publication volume in this field grew rapidly, reaching its first peak in 2009 with over 20 articles published. The second active period focused mainly on 2018–2022, characterized by a surge in total publications in this field, with peaks appearing in 2018 and 2022, reaching 30 and 50 articles respectively. Both active periods are closely correlated with important policy orientations and major sports events in China, demonstrating that research on this theme possesses strong timeliness, relevance, and policy guidance.

3.2 Analysis of Journal Source Distribution

The journals in which papers are published serve as carriers of academic research, reflecting the attention and coverage given to a particular research theme. Through comprehensive analysis of journal sources publishing research findings on the spirit of Chinese sports, this paper maps the distribution characteristics and hierarchical structure of research on this theme, thereby discerning its future direction and providing readers with better platforms and proper guidance for accessing relevant research findings. According to statistical analysis of journal sources for CNKI literature themed “spirit of Chinese sports,” all papers were published across 97 journals. Through classification and sorting, the top three journals in terms of publication volume are *Sports Culture Guide*, *Journal of Wuhan Sports University*, and *Contemporary Sports Technology*, with an average of 18.7 articles per journal. A total of 111 papers were published in CSSCI-indexed journals (excluding extended editions), among which *Journal of Wuhan Sports University*, *Journal of Beijing Sport University*, and *Journal of*

Shanghai University of Sport published 18, 11, and 6 articles respectively, totaling 35 articles and accounting for 31.5% of all CSSCI-indexed papers. Evidently, comprehensive sports journals and university sports journals have devoted more sustained attention and deeper exploration to research on the spirit of Chinese sports, gaining full recognition from the academic community in this thematic area and consistently occupying a dominant position. However, overall, the journals publishing research on the spirit of Chinese sports exhibit an unbalanced state in terms of variety, level, quantity, and quality.

Table 1 Comparison of CSSCI Journal Sources and Total Journal Publications (Top 10)

Note: The original table contained fragmented data; the key findings are that CSSCI journals show concentrated publication in top-tier sports university journals, while overall distribution spans 97 journals with the top three being Sports Culture Guide, Journal of Wuhan Sports University, and Contemporary Sports Technology.*

3.3 Analysis of Discipline Distribution

According to CNKI's discipline classification, this paper conducts a comprehensive review and analysis of the disciplinary distribution of 313 relevant documents on the spirit of Chinese sports. The findings reveal that sports science produces the highest number of publications on this theme, with 206 articles accounting for 65.8% of the total literature. This is followed by higher education, ideological and political education, culture, and political science, with 22, 18, 8, and 5 articles respectively. Literature related to journalism and communication, sociology, economics, administrative management, and secondary education each reached more than 3 articles. Through disciplinary distribution analysis, it becomes clear that sports science, higher education, and ideological and political education demonstrate stronger representation in CSSCI-indexed publications, displaying significant academic influence and gradually forming a core disciplinary research circle. In recent years, research on this theme has shown a trend toward disciplinary diversification, yet interdisciplinary research remains noticeably insufficient, resulting in limitations in both the breadth and depth of thematic exploration and indicating considerable room for subsequent research.

Table 2 Distribution of Publications by Discipline (Top 10)

Note: The original table was incomplete; the textual description above provides the complete disciplinary distribution data.

3.4 Analysis of Research Institution Distribution

In terms of research institution distribution, all authors of the 313 relevant documents on the spirit of Chinese sports originated from 192 institutions, with 4 institutions producing more than 10 publications each. The institution with the

longest research duration and most productive output on this theme is Wuhan Sports University, with 20 publications, followed by Beijing Sport University with 16 publications, Nanjing Sport Institute with 11 publications, and Shanghai University of Sport with 10 publications. As shown in Figure 2 [Figure 2: see original paper], research institutions focusing on this theme are primarily concentrated in universities, particularly sports universities, which constitute the vast majority and represent an important force contributing to research findings on this theme. This indicates that research on this theme has yet to attract sufficient attention and in-depth exploration from other types of research institutions. Research on the spirit of Chinese sports constitutes a comprehensive, multi-domain systematic project that requires the participation of multiple forces to create broader development space. Overall, comprehensive universities and government research institutions will become key influencing factors and important forces that cannot be overlooked in future research on this theme.

3.5 Analysis of Author Co-occurrence Network

According to CNKI statistics, a total of 418 authors (including non-first authors) published research on the spirit of Chinese sports between 1996 and 2022. This paper applies Price's Law to identify core authors using the following calculation formula:

$$M = 0.749 \times \sqrt{N_{\max}} \quad (1)$$

where N_{\max} represents the maximum number of papers published by a single author on this theme between 1996 and 2023. Statistics show that the most prolific author in the retrieved literature published 7 papers, giving $N_{\max} = 7$. The calculation yields $M = 2.6215$, which rounds to 3.0, establishing the threshold for core authors as those with 3 or more publications on this theme. Analysis of author productivity reveals that 19 authors meet this criterion, representing 4.5% of all authors publishing on this theme, while over 65.6% of authors contributed only a single publication. These results indicate that most authors have relatively low publication frequency, and a core author group (meeting Price's Law standard of at least 50%) has not yet formed. The two most productive authors are Huang Li and Zhao Fuxue, with 7 and 5 publications respectively, and both scholars' academic papers were published in Chinese core journals, demonstrating that their research in this field is more systematic, in-depth, and academically influential.

Figure 3 [Figure 3: see original paper] illustrates the collaborative network of authors on the spirit of Chinese sports. The network reveals certain collaborative relationships among researchers, such as Huang Li and Fu Zhiming, Lü Wangang and Li Aiqun, Yang Mei and Li Liang, and Zhao Guozhen and Wang Xiaoxia. However, collaboration among core authors remains limited, with most authors appearing as isolated nodes without forming prominent collaborative relationships or academic groups. Moreover, author collaboration networks consist

primarily of unidirectional closed chains, with collaborators often being internal to the same discipline and collaboration scales remaining small [4]. This indicates that authors predominantly choose to cooperate with scholars from their own institutions, while cross-disciplinary and even cross-regional collaborative exchanges are relatively rare, reflecting that research on this theme has not yet generated strong collective momentum or established a robust academic sharing platform.

3.6 Analysis of Keyword Co-occurrence Network

Based on CNKI literature data, 111 keywords are associated with the theme “spirit of Chinese sports.” Knowledge graph analysis reveals that “sports spirit” appears with the highest frequency, occurring in 32 documents, while keywords such as sports power, sports culture, and national spirit also appear frequently. As shown in Figure 4 [Figure 4: see original paper], each keyword corresponds to a node, with higher-frequency keywords displayed as larger circles. The figure clearly demonstrates a knowledge graph centered on the spirit of Chinese sports, radiating outward to multiple keywords including sports spirit, sports power, sports culture, sports thought, core values, and the new era.

As shown in Table 3, this paper summarizes 7 keywords with centrality ≥ 0.1 as identified by CiteSpace. To a certain extent, keywords with centrality ≥ 0.1 can be regarded as hotspots and focal points in research on this theme. Analysis of these keywords also demonstrates their strong relevance to thematic research, holding important academic value and practical significance for further expanding research on this theme.

Table 3 : Keywords with Centrality ≥ 0.1

Note: The original table listed the keyword “Spirit of Chinese Sports” but was incomplete; the analysis identified 7 such high-centrality keywords as discussed in the text.

3.7 Research Development Path and Hotspot Evolution

Based on the emergence of keywords in different time periods, the evolution of research hotspots in this field can be intuitively and clearly reflected. This paper divides the research evolution process into four stages:

Stage 1: Early Embryonic Stage (1996–2005), primarily involving preliminary exploration of the spirit of Chinese sports and the formation of basic understanding. In 1996, leaders of the State Sports Administration first proposed the important concept of “spirit of Chinese sports.” In March 1997, *Sports History and Culture* published an article titled “The Spirit of Chinese Sports and the Construction of Spiritual Civilization,” and Liu Ji (1997) further summarized and refined the connotation of the spirit of Chinese sports [5], enabling the academic community to develop preliminary understanding and establishing the starting point for academic research on the spirit of Chinese

sports. Following Comrade Jiang Zemin's affirmation of the spirit of Chinese sports summarized and refined from China's sports front in 2000, more scholars devoted greater attention to and conducted deeper interpretations of the spirit of Chinese sports. For instance, Xie Qionghuan (2000) considered the spirit of Chinese sports as spiritual wealth for the entire nation [6]; Chu Bo and Zhang Yutian (2001) viewed the spirit of Chinese sports as significant for strengthening teacher ethics construction in sports institutions [7]; and Zhao Gaocai (2004) argued that the spirit of Chinese sports and the national spirit possess unified attributes at their core and are fundamentally consistent [8]. During this stage, scholars focused primarily on connecting the spirit of Chinese sports with spiritual civilization construction, sports ethics, sports culture, sports teaching, and teacher ethics development.

Stage 2: Rapid Development Stage (2006–2011), characterized by continuous research on the specific content of the spirit of Chinese sports, forming distinct theoretical interpretations and logical threads, and achieving remarkable results in aspects such as connotation, origin, and contemporary characteristics. Scholars such as Huang Li (2007), Zheng Guohua (2007), and Hu Xiaoming (2009) further explored the origin of the spirit of Chinese sports, explained its essential characteristics, clarified its functions, and traced its roots in traditional Chinese culture, particularly through deep analysis of the successful hosting of the Beijing Olympics and China's brilliant achievements in sports. Scholars focused primarily on the theoretical relevance between this theme and sports culture, competitive sports, Olympic spirit, and harmonious society, with research on the spirit of Chinese sports during this stage already showing a spark that could start a prairie fire.

Stage 3: Steady Development Stage (2012–2017), during which the Chinese Dream of the great rejuvenation of the Chinese nation provided developmental direction for sports undertakings, forming new research hotspots and themes that propelled research on the spirit of Chinese sports into a stage of sustainable development. Scholars focused primarily on research related to core socialist values, building a moderately prosperous society, the Chinese Dream, and sports undertakings. For example, scholars such as Zhu Xiong (2015) and Zhou Yongqi (2016) argued that the spirit of Chinese sports exhibits high compatibility with core socialist values. Other scholars proposed that the spirit of Chinese sports in the new era constitutes an important component of building a moderately prosperous society and provides powerful spiritual motivation for realizing the Chinese Dream.

Stage 4: Breakthrough Development Stage (2018–2023), focusing on research concerning the inheritance and promotion of the spirit of Chinese sports against the backdrop of the new era, producing a batch of high-quality research findings. Particularly following General Secretary Xi Jinping's statement that the spirit of Chinese sports represents precious wealth for the Chinese nation that must be inherited and promoted [9], and the hosting of the 2022 Beijing Winter Olympics, research on this theme has presented a "blowout" academic

phenomenon. Many scholars have combined the spirit of Chinese sports with the national spirit, sports power, and Beijing Winter Olympics, proposing new theoretical perspectives and academic viewpoints. For instance, Huang Li (2022) traced the gestation and formation of the spirit of Chinese sports, explaining why it “has not come easily and is extremely precious” [10]; Luo Xiaoting (2021) proposed pathways for inheriting, innovating, and developing the spirit of Chinese sports in the new era [11]; Zhao Fuxue et al. (2023) studied the timeliness of the Beijing Winter Olympic spirit from the perspective of sports becoming a hallmark undertaking of the great rejuvenation of the Chinese nation [12]; and Jin Zhaoxia (2023) argued that the Beijing Winter Olympic spirit represents the inheritance and innovation of the spirit of Chinese sports [13].

Table 4 Evolution and Frequency of Keywords over Time

Time Period	Common Keywords/Frequency	Emergent Keywords
1996–2005 (Stage 1)	Spirit of Chinese Sports/23, Sports Spirit/5	Spiritual Civilization, Sports Ethics, Sports Culture, Sports Teaching
2006–2011 (Stage 2)	Spirit of Chinese Sports/18, Sports Spirit/7	Sports Culture, Olympic Spirit, Harmonious Society, Competitive Sports
2012–2017 (Stage 3)	Spirit of Chinese Sports/39, Sports Spirit/8	Moderately Prosperous Society, Core Values, Chinese Dream, Sports Undertakings
2018–2023 (Stage 4)	Spirit of Chinese Sports/31, Sports Spirit/12	Sports Power, New Era, National Spirit, Beijing Winter Olympics

As shown in Table 4, regardless of changing times or evolving sports undertakings, the theme of the spirit of Chinese sports remains clear. Core keywords such as sports spirit, sports culture, and core socialist values have maintained prominent positions across different periods, forming a complete research main thread.

4. Research Conclusions and Prospects

4.1 Research Conclusions

First, research on the spirit of Chinese sports demonstrates continuity and high efficiency. Since the concept was formally proposed in 1996, research on this theme has maintained a clear main thread and trajectory, producing a certain

number of research findings annually and showing a sustained growth trend. Current research reveals that the academic community primarily explores five aspects: logical construction, core concepts, contemporary value, inheritance and continuation, and dialectical relationships, continuously achieving fruitful research results.

Second, research on the spirit of Chinese sports exhibits guidance and practicality. Based on the temporal distribution of publications in this field and the co-occurring keywords reflected in each stage, the policy orientation and practical nature of this thematic research are clearly evident. On one hand, the spirit of Chinese sports was nurtured, formed, and enriched through long-term sports practice under party leadership. The party and state have formulated different policies and requirements for sports development during specific historical periods, with each major policy and strategy providing favorable opportunities and strong momentum for research on the spirit of Chinese sports. On the other hand, the spirit of Chinese sports represents a concrete manifestation of the Chinese national spirit on the sports front [14]. Through analysis of major events, activities, or typical groups (individuals) in China's sports sector, scholars have sorted out and summarized specific cases and evolutionary patterns formed through practical innovation.

Third, research on the spirit of Chinese sports shows diversity and high citation rates. Academic research on the spirit of Chinese sports is conducted based on social realities and sports undertakings requirements, representing an important mission entrusted by the times. In terms of research subjects, there is diversity; in research perspectives and forms, there is multiplicity; and in research content, there is richness and diffusivity. Regarding research outcomes, many articles demonstrate high citation rates, fully reflecting the high quality and standards of scholars' research on this theme and indicating high recognition of these research findings by the academic community.

Fourth, research on the spirit of Chinese sports exhibits certain limitations and dispersion. For instance, the academic community has not yet formed a clear research main thread and subject, lacking holistic and systematic research; research independence and influence are insufficient, lacking international perspective and strategic height; a core author group has not yet formed, with dispersed output from individual institutions; and comprehensive disciplines have not contributed much research to this field, which to some extent limits innovative disciplinary development.

4.2 Future Prospects

As China embarks on the new journey toward its second centenary goal, conducting in-depth research on the spirit of Chinese sports holds important contemporary value and practical significance for promoting and inheriting the spirit of Chinese sports and continuing red genes. In the coming period, research on the spirit of Chinese sports will gradually form core author groups and academic

collaboration teams that will continue to exert influence, achieving continuous leaps in both publication quantity and quality. Hotspot themes in research on the spirit of Chinese sports will shift toward the organic integration of the spirit of Chinese sports into ideological and political education, school talent cultivation, the party's spiritual lineage, and Chinese national community consciousness. The inheritance, promotion, and pedigree research of the spirit of Chinese sports will become future research priorities. Research perspectives on the spirit of Chinese sports should not only involve theoretical interpretation and analysis but also strengthen empirical research through practical cases. Therefore, greater interdisciplinary and comprehensive disciplinary collaboration and research cooperation are needed to form a complete disciplinary research system. From a dynamic perspective, research on the spirit of Chinese sports will follow a developmental logic from "potential" to "manifest" and from "dispersed" to "integrated," promising greater disciplinary advantages and development space in the future.

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Note: Figure translations are in progress. See original paper for figures.

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