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Research Article

The Planned Behavior Management in Physical Activity Programs in China: A Bibliometric and Visual analysis

Guo Chen[1] and Chonlavit Sutunyarak[2*]
1 Chakrabongse Bhuvanarth International College of Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok, Bangkok, Thailand, Email: guo.che@rmutto.ac.th
2* Chakrabongse Bhuvanarth International College of Interdisciplinary Studies, Rajamangala University of Technology Tawan-ok, Bangkok, Thailand, Email: chonlavit_su@rmutto.ac.th

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ABSTRACT

In this paper, the bibliometrics analysis software Cite Space is used for quantitative analysis of the retrieved literature, aiming to provide a systematic and complete knowledge graph for the study of the change of physical activity level of Chinese college students. In this paper, academic journals and papers from 2004 to 2024 in the National Database (CNKI) were selected as literature sources, and 484 articles were selected as research objects after screening. In this way, the annual publication volume, international publication and cooperation characteristics, institutions and cooperation, authors and cooperation characteristics, research hotspots and research frontier evolution of Chinese university students' physical activity research literature in domestic journals were grasped. The map was drawn and analyzed, and the analysis results were presented in the form of tables and visual images. Through data analysis, improving the physical activity level of Chinese higher education students is the premise of improving the national physical condition, and it is also an important task to realize the strategy of "Healthy China" in the new era.

Keywords: Behavioral changes, planned behavior, physical activity, bibliometric analysis

INTRODUCTION

The CPC Central Committee and The State Council established the national survey system on students' physical fitness and health in 1987. Since then, the national education department has established the important work of conducting a survey on physical fitness and health of school students aged 6 to 22 every five years. The national survey on students' physical fitness and health is an important part of the national physical fitness monitoring system and an important content of school physical education, health and health education. It is an important basis to improve the evaluation mechanism of school physical education, health and health education to carry out investigation and random check and review work. The

fundamental goal of organizing and carrying out the research and check work well is to grasp the current situation and development trend of Chinese students' physical fitness and health, promote the full implementation of the Party's educational policy in the new era by local governments and schools, and scientifically evaluate the effectiveness of school physical education, health and health education. The research and random checks were carried out among students from full-time primary and secondary schools and institutions of higher learning in 31 provinces (autonomous regions and municipalities directly under the administration of the Xinjiang Production and Construction Corps. The subjects of the survey and random checks were students aged between 6 and 22, covering a total of 16 grades from the first grade of primary school to the fourth grade of university. The method of stratified random cluster sampling was used in the research and random survey, including test items and questionnaire. In 1985, 1990, 1995, 2000, 2005, 2010, 2014 and 2019, the Ministry of Education and other relevant departments have organized eight national surveys on the physical fitness and health of Chinese children and adolescents. Each survey has accurately grasped the physical health status and development trend of Chinese children and adolescents. It has provided the most important basis for the research and formulation of policy documents on strengthening and improving school physical education, hygiene and health education. According to the latest results of the Eighth National Survey on Physical Fitness and Health of Students of the Ministry of Education (2021), students have a high rate of poor eyesight and myopia, an increase in overweight and obesity, a decline in grip strength, and a decline in physical fitness of college students. According to the report of the World Health Organization (2019), lack of physical activity has become the fourth risk factor leading to human death. Numerous studies at home and abroad have confirmed the close relationship between physical activity levels and health risk factors, and increasing physical activity can improve people's overall health. Getting enough physical activity at the college level can reduce the risk of chronic diseases in adulthood, form exercise habits, and promote physical and mental health. Therefore, it is necessary to grasp the important period of college, in-depth study of college students' physical activity, enrich and improve the research system of physical activity of Chinese higher education students, and promote the improvement of the level of physical activity of college students with theory guiding practice. With the vigorous development of the information age, literature materials have multiplied, and the traditional collection and processing methods are obviously unscientific in the face of huge databases. Cite Space visual metrology tool is used to combine bibliometrics research methods with knowledge graph research methods to effectively integrate, sort out and analyze a large number of literature data. Accurately grasp the development and construction of relevant fields at home and abroad, sort out the basic characteristics, cooperation methods, research institutions, frontier trends and other contents of the current Chinese research field at home and abroad, discover the changes in the level of physical activity behavior of Chinese college students, and identify the current and future research hotspots and development trends. To provide reference for the participation methods and research paradigms of Chinese higher education students' physical activity level, further enrich the research content and deepen the research connotation, and provide new ideas, new methods and new directions for the follow-up related research.

LITERATURE REVIEW

Cite space Knowledge Graph is a Java-based information visualization software developed in 2003 by Chen Chaomei, professor of computer and information science at Drexel University in the United States. Its main inspiration comes from the evolution of Kuhn's scientific structure, believing that scientific development can be extracted from published literature. Cite Space is short for Citation Space, which translates as "citation space". Knowledge graph is a new research field developed on the basis of citation analysis. It is a new development of scientometrics by using data mining, information processing, knowledge measurement and graph drawing to intuitively reveal the development course, structure characteristics and evolution law of scientific knowledge in complex scientific knowledge fields. Chen Yue et al. (2015) distinguished the two concepts of "knowledge graph" and "knowledge map" and reshaped the definition of scientific knowledge graph. In this study, the results of analyzing and processing knowledge data of different backgrounds with different measurement methods were introduced so far, and the application prospect of knowledge graph in the next stage was predicted. This is the earliest literature on scientific knowledge graph that can be retrieved in China at present, which provides theoretical reserve for the subsequent research in this field. Since 2015, the number of papers published in China using Cite Space software for research has doubled. Cite Space focuses on expressing the strength of relationships through graphs and connections, which has certain advantages in revealing the dynamic development rules of disciplines and discovering research frontiers. Cite Space software uses the cosine algorithm to calculate the strength of collaboration between researchers or institutions. The strength of the connection between the nodes represents the strength of the association between the researchers or institutions and is calculated by the cosine distance of the angles between the nodes. Formula (1) is as follows:

$$\text{Cosine}(x, y) = \frac{XY}{[X][Y]} = \text{Cosine}(c_{ij}, s_i, s_j) \frac{C_{ij}}{\sqrt{S_i S_j}} \quad (1)$$

Where Cij represents the number of papers published by co-authors (author i and author j), Si and Sj represent the number of documents published by author i and author j, respectively, and the value of collaboration intensity ranges from 0 to 1.

Current sports policy, sports education, sports law, sports industry and so on are the fields where knowledge graph is most applied in sports field research. Wang Qi (2010) is the first scholar in the field of sports who uses Cite Space software in core journals. His research object is the papers related to the international Olympic Movement research from 1995 to 2009, which sorted out the status quo and development trend of the international Olympic movement research and provided feasible development suggestions for the domestic Olympic research. Since then, Wang Qi has continued to use the research method of Cite Space to analyze the co-occurrence of research keywords in three famous comprehensive journals of international sports science, and to show the characteristics of domestic sports science cooperation network.

In terms of physical education, Gao Ming et al. (2015) took 4178 foreign literatures as research objects and concluded that the annual number of articles published in physical education research showed a wavy growth trend through knowledge graph analysis. The country distribution and main journal sources are

mainly European and American countries; High-yield institutions are mainly from the United States and the United Kingdom; The leading subjects of high-yield authors are Chinese. In 2019, Gao Ming followed the research method of CiteSpace to analyze the current status and development trend of foreign physical education evaluation research, and believed that the current foreign physical education evaluation presents a trend of interdisciplinary multi-perspective, multi-evaluation theory integration and diversified research methods, paying more attention to the evaluation of different cultures, populations, races and special groups. Pay attention to long-term and long-term research. In terms of sports application, Zhao Bingjun (2013), in his doctoral thesis, analyzed the spatio-temporal characteristics, knowledge network structure and evolution model of strength training in foreign countries through the social network analysis method of knowledge graph, found out the problems of strength training in China, and provided methods for strength training in China. In his master's thesis, Li Zongbin (2018) analyzed the research situation of tennis scientific research literature in Chinese core journals from 1992 to 2017, and found that there are some deficiencies in the attention, reference and utilization of new knowledge and new scientific research results in the field of tennis scientific research in China.

In terms of physical education, Zhang Jian (2018), using Cite Space V software, selected the Web of Science database as the data source to analyze the disciplinary characteristics, dynamic evolution and frontier hot spot research of international physical activity research for children and adolescents. (2019) Combined quantitative and qualitative methods to analyze the characteristics and frontier hot spots of international research on children and adolescents' physical activity, summarized the characteristics of countries, authors, institutions and major journals that participated in the research on children and adolescents' physical activity from 1987 to 2017, and sorted out different types of research hot spots. (2020) Continue to use this method to sort out international research hotspots on children and adolescents' physical activity built environment, and draw on international experience to provide coping strategies for the problems existing in the research on children and adolescents' physical activity built environment in China. In his doctoral thesis, Yin Long (2018) reviewed the cooperation in the field of physical activity in China, made a co-occurrence analysis of keywords and cited literatures with the help of Cite Space software, and analyzed the frontier hot spots and development trends of physical activity research in China. At the same time, the theory of self-determination and the theory of planned behavior were integrated in order to construct a cross-context theoretical model for predicting adolescents' physical activity behavior, and the theoretical model was used to conduct a quasi-experimental design for the intervention research of social situations in physical education teaching.

According to the existing literature, there are few studies on the physical activity level of students in Chinese colleges and universities, especially the systematic comparative study of domestic literature is lacking. Therefore, this paper uses CiteSpace software as a measurement tool, selects academic journals and academic papers from March 2004 to March 2024 in the National database (CNKI) as literature sources, and selects "colleges and universities", "sports" and "physical activity level" as keywords. After screening, 484 domestic literatures on physical activity of adolescents were obtained as the research objects, and maps were drawn and analyzed.

RESULTS

Visual analysis of research on physical activity level behavior of Chinese higher education students

1) Characteristics of the number of articles published in the research on physical activity level behavior of Chinese higher education students

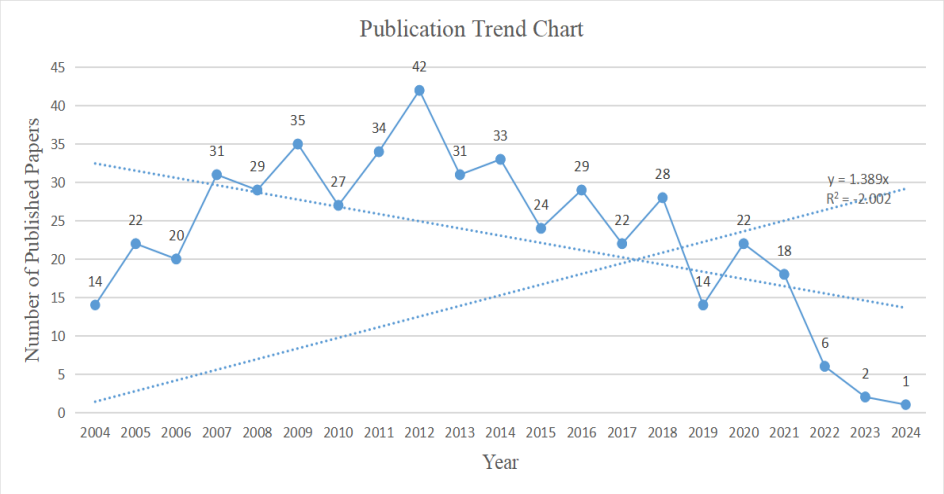

Figure 1. The change trend of the number of papers published on the research of physical activity level behavior of Chinese higher education students in China

With the help of the number of published scientific research documents, we can clearly see the change of the current research situation in this field and the relationship between time, and then understand the development of the current research field or the future development trend. As can be seen from Figure 1, the number of published papers on the level of physical activity in colleges and universities in 2004-2014 was significantly higher than that in 2014-2024. Among them, the number of published papers increased significantly from 2007 to 2012, with a total of 198 published papers, accounting for 40.9% of the total published papers in the past 20 years, which was a small peak in China's domestic research. From the perspective of literature review and combined with the historical background, the policy of "Opinions on Strengthening Youth Sports and Enhancing Youth Physical Fitness" issued by the state in 2007 has greatly influenced the attention of some scholars. From 2013 to 2018, although there was a small change in the number of published papers, the overall state remained relatively stable, with a total of 167 published papers, accounting for 34.5%. This may be related to the Outline of the Healthy China 2030 Plan released in 2016 and the Opinions of The State Council on Implementing the Healthy China Action and the Healthy China Action (2019-2030) released in 2019, which emphasize the coordinated development of cultural learning and physical exercise to promote people's healthy growth, temper their will and improve their personality. The cultivation of morality, intelligence, physical fitness, the United States and labor is closely related to the all-round development of the people. Based on the state's emphasis on the healthy growth of college students, as well as the rapid development of national economy, the improvement of people's quality of life, and the public's attention to personal health, Chinese scholars have attracted the attention of this field. The research on the theme of "physical activity level of college students" is in a stage of rapid development, and various research results are remarkable. Figure 1 shows the time distribution characteristics of the number of published papers on the topic of this study, which lays a theoretical and

factual basis for the following research.

2) Institutional cooperation network and author cooperation network for research on physical activity level behavior of Chinese higher education students

The term "scientific research institution" refers to having a clear research direction and task; An institution with a certain number and quality of researchers and academic leaders engaged in long-term organized research and development activities. Visual analysis is helpful to quickly locate the research institutions in the field of physical activity level in Chinese universities, and understand the achievement contributions and high-yield institutions of the institutions in the neighboring city. At the same time, with the help of co-occurrence analysis of scientific research institutions, the main knowledge creation and influence distribution in the research field can be intuitively displayed, and the research progress and research content of the cooperation of relevant scientific research institutions can be analyzed.

Institutional Cooperation Network

Import Chinese data into Cite Space software, set the time period from 2004 to 2024, select 1 year for time slice, select seasonal node type, select the default algorithm of the system, and run the program to obtain the cooperation network of domestic research institutions (Figure 2).

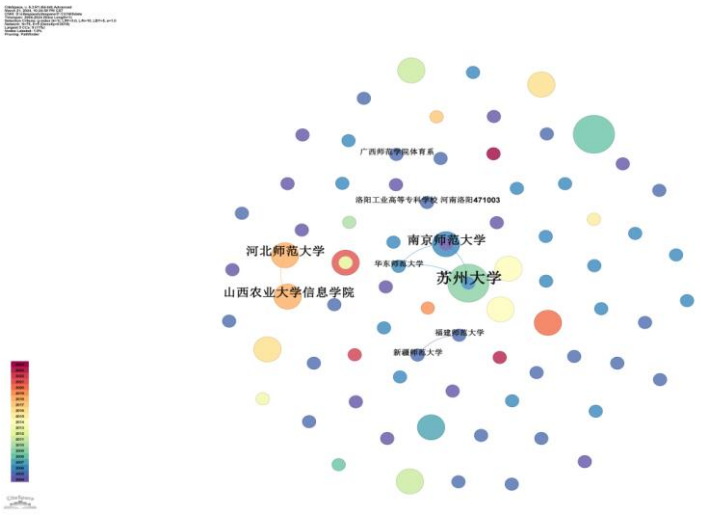

Figure 2. Cooperation network of domestic research institutions

As can be seen from Figure 2, the cooperative network of domestic research institutions has formed a cooperative co-occurrence map with 76 nodes, 5 connections and a network density of 0.0018. The nodes in the figure are each research institution, the size of the nodes represents their frequency of occurrence, the thickness of the connections between nodes represents the co-occurrence intensity, and each color in the figure corresponds to the year of literature publication. Among the nodes of the overall cooperation network, blue and purple are more frequent. According to the corresponding year table, it can be seen that domestic institutions have carried out more work in this field than in recent years. In the center of the network, Soochow University, Nanjing Normal University and East China Normal University have formed a triangular connection, Hebei Normal University and Information College of Shanxi Agricultural University, and Fujian Normal University and Xinjiang Normal University have formed a two-way connection, while other institutions are scattered and mostly exist independently. On the whole, the

frequency of domestic cooperative institutions is low, which indicates that more contacts can be strengthened in institutional cooperation in the future.

Author cooperation Network

Scientific researchers are the actual practitioners of scientific research and the direct factors for the output of scientific research results. The core authors are the backbone of scientific research output and play a demonstration and leading role in the research field. At the same time, a stable team of authors helps to promote the rapid development of the research hub and become the backbone of the research hub with high academic value. The generation of author co-occurrence network can intuitively understand the structural relationship between authors in the research area.

484 academic journals and papers were introduced into Cite Space software, the time was set from 2004 to 2024, the time slice was selected for 1 year, the node type was selected as the author, and the minimum spanning tree algorithm was selected to simplify the network and highlight important structural features. To draw the co-occurrence network of authors for research on changes in physical activity levels in domestic universities (Figure 3) and study authors.

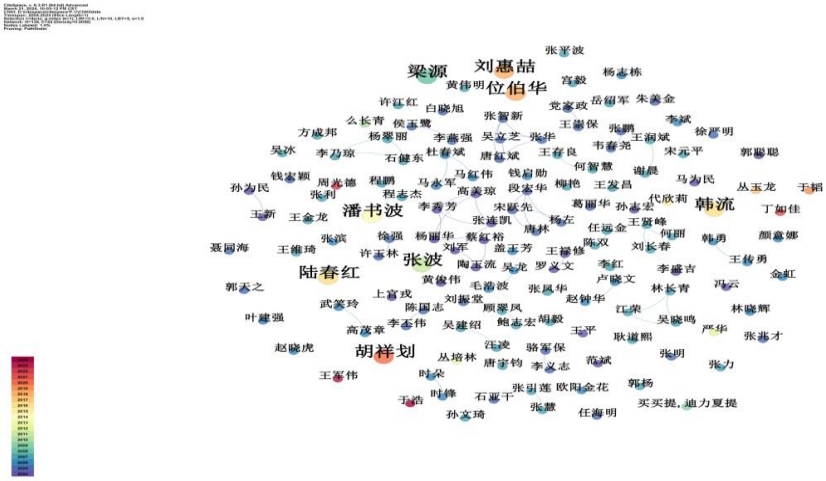

Figure 3. Co-occurrence network of domestic research authors

As figure 3 shows a co-occurrence network consisting of 139 nodes and 54 connections, and a domestic co-occurrence network with network density of 0.0056. The nodes represent the author, the connecting lines represent the cooperative relationship, and the thickness of the connecting lines represents the strength of the relationship. The top band goes from cool color to warm color, representing the time of publication from far to near. In the center of the picture, it can be seen that Song Yuexian, Tang Lin, Yang Zuo and Duan Honghua have a close cooperative relationship, mainly studying the sports cultural quality of college students; Gao Meiqiong, Li Xiufang, Yang Lihua and Zhang Liankai have close academic exchanges, mainly studying physical education courses and sports. The other authors are mostly scattered in their research, or have some cooperation and communication with triangular relationship and linear relationship. It can also be seen from the year colors in the figure that most of the research papers on the level of physical activity of students in Chinese colleges and universities have appeared in the past four years.

3) Hot spot analysis of Chinese higher education students' physical activity level behavior research

Research hotspots refer to a group of research questions or topics that have been paid attention to by

researchers in a certain period, produced more literature, and have internal links. Keywords can highly refine and summarize the topic of the article, reflect the direction and value of the research, and are the core of the literature. Keywords that appear in high frequency can identify the hot issues that arise in the field. By combing and analyzing the high-frequency keywords in the research of Chinese college students' physical activity level, we can understand the research status and development of hot issues in this field in China, and guide the direction of further in-depth and expanded research.

Co-occurrence of keywords: Import Chinese data into Cite Space, set the time to 2004 to 2024, and select 1 year for time slice. The node type selected keywords, selected the Pathfinder algorithm, set the threshold ≥5, ran the software to generate the keyword co-occurrence map for research on the change of physical activity level of Chinese higher education students (Fig.4), and used the map information to draw the high frequency and high intermediate centrality word list (Table 1) to help decode the keyword co-occurrence network. Intermediary centrality is an index to measure the importance of nodes in the network, which can be used to discover and measure the importance of literature. Nodes with high intermediary centrality are generally key hubs in two different fields. When the node has a purple circle and the intermediary centrality is greater than 0.1, the node needs to be highlighted.

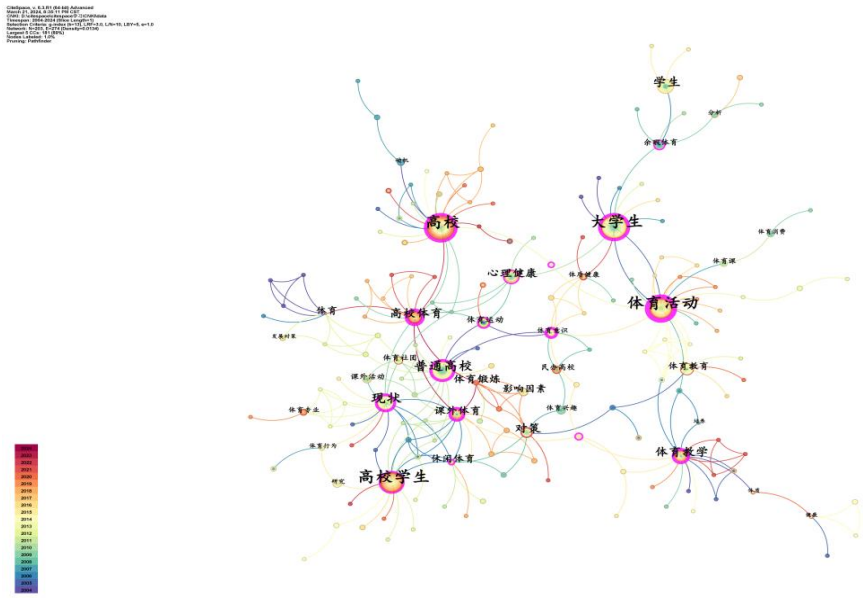

Figure 4 Co-occurrence of keywords in research on physical activity level behavior change of Chinese higher education students

According to the network node information shown in Figure 4, a keyword co-occurrence network with 203 nodes and 274 connections is generated. The color band on the left of the graph indicates the time change of the research on physical activity level in domestic universities, and the cool color to warm color represents the time from far to near. There are more cool colors in the co-occurrence network, indicating that most papers in this research field were produced in the last decade or so.

Rankings	Frequency	Centrality	Year	Keywords
1	71	0.35	2004	Colleges and universities
2	69	0.27	2004	College students
3	67	0.45	2004	Physical activity
4	65	0.13	2004	College students
5	39	0.24	2004	Status quo
6	29	0.21	2004	Colleges and universities
7	26	0.03	2005	Students
8	21	0.25	2004	Physical Education
9	21	0.31	2008	College sports
10	19	0.09	2004	Countermeasures
11	16	0.16	2005	Mental health
12	14	0.06	2007	Physical exercise
13	13	0.32	2006	After-school sports
14	12	0.11	2006	Leisure Sports
15	11	0	2010	Influencing factors

Table 1 List of key words for research on physical activity level behavior change of Chinese higher education students

"college", "college students", "sports activities" and "college students" are high-frequency and high-intermediate central words. Since these two keywords are the search terms for this study, they are not specifically elaborated. As can be seen from the list of high-frequency and high-mediation-centrality words and related literature, the frequency of "current situation" ranks fifth, and the mediation-centrality reaches 0.24, indicating that scholars pay more attention to the understanding and analysis of the real situation in research papers in this field. "Physical education", "college sports", "mental health", "physical exercise", "extra-curricular sports" and "leisure sports" are all keywords of specific research content, representing the research content related to physical activities. Among them, the centrality of "extra-curricular sports" is 0.32, ranking first, indicating that the research content related to "extra-curricular sports" occupies an important position in domestic research.

Keyword clustering: On the basis of keyword co-occurrence map, keyword clustering can further explore the hot topics of college students' physical activity research. On the basis of the co-occurrence map, keyword clustering can further explore the hot topics in the study of adolescent physical activity in China. After clustering, the value range of Q is [0,1], Q>0.3 means that the network community structure is significant, S value is 0.7, the clustering result is high reliability, and S value is above 0.5, the clustering is reasonable. Click "K" on the Cite Space operating interface to cluster, generate keyword clustering (Figure 5), and obtain a hot-spot clustering network with Q =0.7778 and S =0.9462. Then, the hotspot clustering is significant and has high reliability. According to the keyword clustering information, the co-occurrence

network diagram of domestic research keywords was drawn (Figure 5), and 10 clusters were obtained, which were #0 sports activities, #1 college students, #2 colleges and universities, #3 physical education, #4 colleges and universities, #5 status quo, #6 college students, #7 college sports, #8 physical exercise, and #9 physical health. Combined with the software data, the clustering information table of key words for the research of physical activity level behavior of Chinese college students was drawn (Table 2).

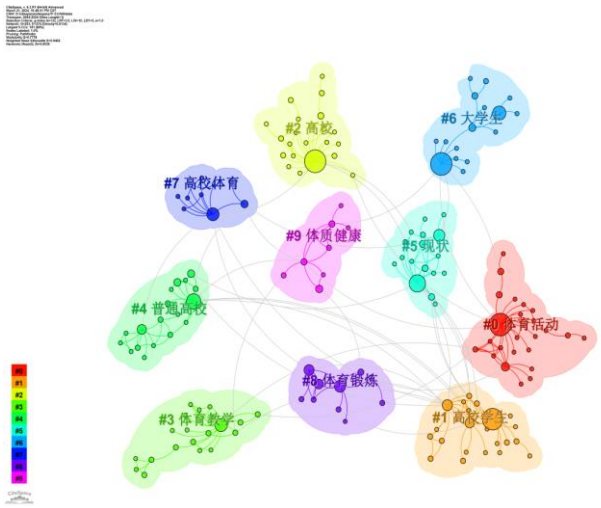

Figure 5: Clustering of key words for research on physical activity level behavior change of Chinese higher education students

Table 2 Clustering information table of keywords for research on physical activity level behavior of Chinese college students

Tags	Number of nodes	S value (cluster tightness)	Year	Size
#0 Physical activity	25	0.992	2012	(10.1) Physical Education; (9.97) Physical education; (9.81) Accidents and accidents; (9.81) sports consumption; And (8.35) sports activities
#1 College students	23	0.916	2012	(13.85) Leisure; (11.91) leisure sports; (11.72) Strategy; (9.81) activity effect; (9.81) Shaanxi Province
#2 Universities	22	0.96	2012	(12.68) Physical Education courses; (10.1) Physical education; (10.1) Motivation; (9.81) Football; And (9.81) Sports reform
#3 Teaching physical education	20	0.983	2011	(11.91) Physical Education teaching; (7.53) Teaching; (5.9) Physical education; (5.81) Interest; And (4.93) health
#4 General colleges and	18	0.958	2008	(11.07) Universities and colleges; (9.81) Development measures; (6.3) extra-curricular

universities				sports activities; (6.23) sports activities; And (6.21) physical education
#5 Status quo	17	0.858	2010	(10.78) Status quo; (8.59) Leisure; (7.63) extra-curricular sports; (7.53) extracurricular sports activities; And (6.97) research
#6 College students	16	1	2009	(16.3) Leisure Sports; (10.1) Survey; (9.81) Current situation investigation; (9.27) Current situation; And (8.59) analysis
#7 College sports	10	0.916	2014	(10.1) Sports; (7.71) University sports; (5.9) Physical education; (5.51) Universities and colleges; And (5.43) teaching
#8 Physical exercise	10	0.809	2009	(9.97) Physical Exercise; (9.81) leisure activities; (8.59) Leisure; (8.32) Countermeasure; And (6.68) influencing factors
#9 Physical health	9	0.947	2011	(10.1) Physical health; (9.81) Sports awareness; (5.81) Consciousness; (4.93) Health; (4.91) three-walk activity

Based on Figure 4 keyword co-occurrence map, Table 1 high frequency and high intermediary word list and Table 2 keyword clustering information table, the research hotspots of physical activity level behavior of Chinese higher education students can be summarized into the following three aspects: First, researchers habitually analyze the structural model from the status quo to the influencing factors to the countermeasures in the research papers in this field, which can be regarded as the thinking inertia existing in the writing of papers; Second, it can be seen from the content of research on the change of physical activity level behavior that the physical activity behavior of Chinese college students is mainly related to physical exercise, physical activity, leisure sports and physical education courses, and the main scope of activities is concentrated in the campus, and scholars are more inclined to study this content; Third, the study of physical health is an important index to test the physical activity level behavior of college students, because the national physical health standard for students is the evaluation standard for the physical health status and exercise effect of students, in order to implement the guiding ideology of health first, effectively strengthen the school physical education work, and promote students to actively participate in physical exercise and develop good exercise habits. To improve the level of physical health formulated. It is an organic part of the "National Physical Exercise Standards", the specific implementation of the "National Physical exercise Standards" in schools, and the basic requirements of the state for students' physical health, applicable to full-time primary schools, junior middle schools, ordinary high schools, secondary vocational schools and ordinary colleges and universities.

4) Frontier analysis of research on physical activity level behavior of Chinese higher education students

The research frontier refers to the emergence of a large number of new research-related topics at a certain

stage. Identifying the research frontier is helpful to understand the latest evolution dynamics of the current discipline, predict the development trend of future research, and find potential hot research topics. Keyword emergence refers to the significant increase in the occurrence frequency of keywords in a short period of time, indicating increased attention to them during this period, which can show the transfer of research hotspots in different periods and judge the potential development trend and frontier research based on it [. In Cite Space software, through the analysis of titles and abstracts, "Burst Citation" is selected to find emergent words in the literature, which reflect the forefront of current research. Combining the list of emergent words and active literature, the frontier evolution of research on physical activity level and behavior of Chinese university students can be grasped (Fig. 6). The order of the list indicates the time from far to near, the blue line indicates the time interval, and the red line indicates the time interval when the keyword burst.

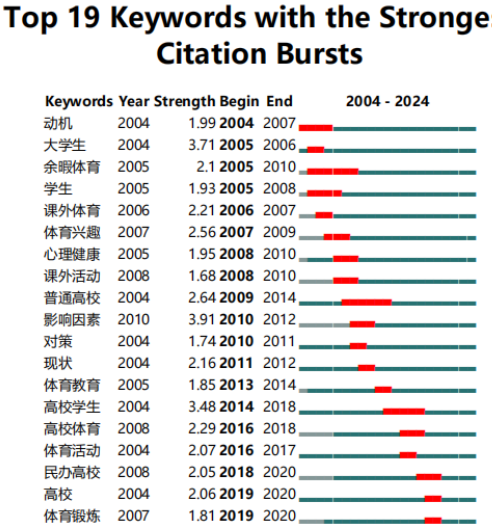

Figure 6 Keywords popping up in the research of sports activity level behavior of Chinese college students Combining with the list of frontier words, we can understand the frontier issues concerned by domestic research and their evolution trend. "Strength" represents the mutation strength of the word, and the greater the value, the stronger the degree of mutation, and the more likely it is to become the research frontier. The red part in the figure represents the time when the mutation words appear and disappear. Corresponding to the years of "Begin" and" End" respectively, 19 frontier words emerged in domestic research from 2004 to 2024. The research frontier began to appear in 2004, and 19 emergent keywords continued to emerge as a whole. According to the time order of emergence of emergent words, the frontier development of domestic research can be summarized into the following two stages: From 2005 to 2018, the domestic research gradually enriched stage, emerged the "sports interest (2.56)", "extra-curricular sports (2.21)", "leisure sports (2.1)", "mental health (1.95)", "extra-curricular activities (1.68)", Among them, "sports interest (2.56)" had a high intensity and a long duration at this stage, lasting from 2007 to 2009, indicating that the majority of domestic studies were conducted to analyze students' interest in sports at this stage. Liu Yang (2009) studied the influence of college students' interest in sports on the public sports curriculum in Beijing from the perspective of better setting up public sports courses in

colleges and universities, improving the teaching process of public sports and optimizing and reforming the setting process of public sports curriculum. In this stage, extracurricular physical education (2.21) was the second most prominent item. In this stage, Xu Wenxin (2006), from the perspectives of psychology, behavior and sociology, used literature, investigation, mathematical statistics and comparative research methods to study 1600 students from 16 colleges and universities in 9 regions of Fujian Province. The present situation and influencing factors of extra-curricular sports activities of college students in Fujian Province were studied, and on this basis, countermeasures were proposed to maintain the sustainable development of extra-curricular sports activities in colleges and universities. Zhan Xun (2017) began to study the current situation and influencing factors of college students' participation in extra-curricular sports activities in Qingdao, so as to provide experience reference and theoretical basis for promoting the development of college sports. From 2021 to the beginning of 2024, due to the impact of the epidemic, there are too few researches in this field in China, which is also the direction of future research.

Conclusions and Suggestions

Compared with the traditional method of establishing a systematic understanding of the field by reading a large number of relevant literatures, Cite Space has the advantage of quickly extracting effective information from the literatures and reflecting it on the knowledge graph, so as to objectively and comprehensively analyze the academic knowledge base, research hotspots and future trends of the field. Through the document visualization function of Cite Space, the research hotspot, development trend and future development direction of physical activity level behavior change in China's higher education can be interpreted.

Conclusions: Domestic research on the change of physical activity level behavior of Chinese higher education students shows an obvious comparison between the number of published papers in the previous decade and the recent decade, and the number of published papers in the recent decade has a downward trend; In terms of institutional cooperation and author cooperation, the frequency of domestic cooperation is not high enough and the connection is not close enough. In terms of keyword co-occurrence, keyword clustering and keyword emergence, the researches in the past 20 years mainly focus on "sports interest", "sports activity" and "sports teaching". Within the time range of the survey, the researches on the change of college students' sports activity level behavior are not too rich, relatively speaking, the research scope can be expanded, and in recent years, affected by the epidemic and other factors. The content, scope and frequency of research have a decreasing trend. The National Fitness Plan (2021-2025) is an important content issued by The State Council in accordance with the National Fitness Regulations to promote the development of national fitness at a higher level and better meet the fitness and health needs of the people. College students are the future needs of the country's development. According to the "National Physical Health Standards for Students", the research on the change of Chinese college students' physical activity level behavior should be the key direction of future research.

Suggestions: Domestic research should take the initiative to broaden their horizons, strengthen technical exchanges with core countries, and increase multidisciplinary cooperation. Scholars can carry out interdisciplinary and transnational cooperation, participate in international academic exchanges, learn from foreign research systems on sports activity level behavior, and set up interdisciplinary

cooperative disciplinary networks such as sports science and psychology. In addition to focusing on the core high-yield countries such as the United States, Australia and the United Kingdom, we can also pay attention to the research trends of college students' physical activity level behavior in many European countries such as Spain, Denmark and Sweden. Improve the research and measurement system of college students' physical activity level behavior. At present, there is no uniform way to measure the physical activity level of college students in China. Chinese scholars should speed up the construction of a complete discipline system of domestic youth research, develop physical activity measurement tools and evaluation methods that adapt to the characteristics of Chinese college students, increase long-term tracking methods, monitor the situation of college students' physical activity, and improve the supervision, measurement and evaluation system of college students' physical activity. The research on physical activity level behavior and mental health of college students in China should be increased. Although the word "mental health" appears in the high-frequency keywords, according to the research, there are not many researches on "mental health" and "physical activity" in China, and the previous research peak dates back to 2005, which is relatively long time. It can be seen that domestic scholars should pay more attention to the research on physical activity level behavior and mental health of college students. Can draw on the international research results, with the help of foreign experience to establish the relevant intermediary model, determine the specific impact mechanism, increase the quality of the relevant content of the measurement effect of the study.

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