



# Comparative Analysis of Taekwondo Research Situation at Home and Abroad Based on Bibliometrics

YuHui Zong<sup>1</sup>, YaoDe Wang<sup>2</sup>, and He Huang<sup>1</sup> (✉)

<sup>1</sup> Department of College of Competitive Sports, The Beijing Sport University, Haidian, Beijing, China

1114747979@qq.com

<sup>2</sup> Department of College of Sports Medicine and Rehabilitation, The Beijing Sport University, Haidian, Beijing, China

**Abstract.** Can in the current study situation of literature metrology, can also predict the future situation, this article through to 2010 to 2020 year of taekwondo corresponding research of core periodical literature data as the research object, using Citespace software analysis, using the method of literature metrology, content analysis, literature research methods, from the research articles, The purpose of this paper is to explore the theme of taekwondo research at home and abroad and the process and characteristics of the research hot spots. This paper draws the following conclusions: domestic literatures basically show a downward trend, while foreign literatures mostly show an upward trend, the total number of foreign publications is higher than that of domestic publications, and it will continue to rise; The number of published papers in domestic universities is relatively concentrated, and many of them are physical education and related specialized periodicals. The colleges and universities in China are mainly specialized sports colleges, while the most productive sports colleges and universities in foreign countries are comprehensive sports colleges. Coordination and cooperation among the various organizations need to be strengthened. The main subjects of domestic research focus include technique and tactics, Taekwondo athletes, physical education and new rules, etc. Sports performance and physiological characteristics are the main focus of foreign research and development.

**Keywords:** Taekwondo · Bibliometric · Research situation · Comparative analysis

## 1 Introduction

### 1.1 Topic Selection Basis

With the popularization and rapid development of taekwondo sport in Our country, more and more experts and scholars have begun in-depth research on the development history and existing problems of taekwondo sport in our country, and have made a lot of scientific research results. However, in today's information boiling, taekwondo scientific

research literature increases, which brings great difficulties to the collation of taekwondo research situation, making researchers unable to grasp the taekwondo research situation quickly and accurately [1]. Bibliometrics is a method that uses statistics, mathematics and other methods to quantitatively analyze all knowledge carriers, find out the relevant rules, and express them through graphs, mathematical models, tables and other methods [2]. Citespace, a bibliometrics analysis software, can reduce the influence of individual and social subjective factors to a certain extent, enrich the theoretical treasure house of Taekwondo research in Our country, enable researchers to master the development of taekwondo research on the whole, and enhance the quality of research. But only when any research work develops from qualitative description to quantitative analysis can it truly become a science [3]. Through the comparative analysis of domestic and foreign research and development hotspots, this paper explores the differences and similarities between domestic and foreign research and development hotspots of taekwondo, in order to provide a new way of thinking for the research of Taekwondo technology in China.

### **1.1.1 Purpose of Study**

From the characteristics of the amount of publications, the characteristics of universities and cooperation, the characteristics of research and the forefront of these three aspects, this paper explores the theme of taekwondo research and the process and characteristics of research hotspots at home and abroad, and then finds out some problems existing in the research of Taekwondo in China, and predicts the future research direction of taekwondo. China started late in the world taekwondo research [4]. We have to come from behind, have a comprehensive grasp of the characteristics of things, it is possible to promote the development of things efficiently [5].

### **1.1.2 Significance of the Study**

At the same time, it also provides a quantitative judgment for the research and development of taekwondo, in order to contribute to the scientific and technological research of taekwondo related sports at home and abroad and the development of taekwondo.

## **2 Research Object and Method**

### **2.1 The Research Object**

The research period of this paper is from 2010 to 2020. There are 162 articles in CNKI core journals and 269 articles in Taekwondo-related academic journals indexed by SCI and SSCI in Web of Science core collection. The data are respectively the research objects.

### **2.2 The Research Methods**

#### **2.2.1 Bibliometric Analysis**

In the application of taekwondo bibliometrics, this paper adopts some basic bibliometrics theories and methods of mathematics, statistics and other related bibliometrics to study

the growth characteristics of taekwondo related literature. In order to evaluate and predict the development status and trend of Taekwondo in China, this paper discusses the growth law of relevant literature, and analyzes the data of relevant literature by using scientific knowledge and atlas comprehensively.

### 2.2.2 Content Analysis

The main purpose of content analysis is to clarify and detect some essential facts and development trends in the literature, disclose the hidden contents and problems contained in the literature, and speculate the future development of the literature. By referring to the relevant literature and key words of taekwondo, this paper makes a judgment on the theme and development direction of the relevant literature research, thus revealing the development trend of taekwondo scientific research deeply.

### 2.2.3 Document Method

The main meaning of literature resource method is a concept that refers to a kind of scientific understanding that people gradually form new people's actual situation of relevant facts by continuously collecting, summarizing or sorting out and studying some existing scientific literature.

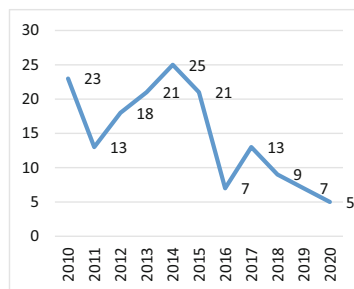
## 3 Research Process and Analysis

### 3.1 Analysis on the Characteristics of Taekwondo Research Published at Home and Abroad

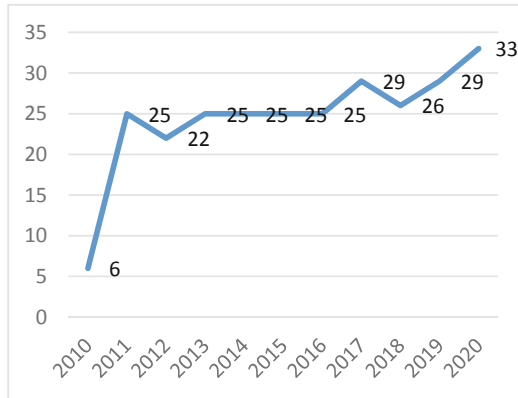
#### 3.1.1 Analysis on the Characteristics of Domestic Taekwondo Research Publications

According to the collected data, 162 taekwondo core journals have been published in China during the 11 years from 2010 to 2020, as shown in Fig. 1.

It can be seen that the number of domestic taekwondo studies published year by year is not regular, from 23 in 2011 to 5 in 2020, the number of articles published in the past 11 years is not even, the number of articles published in 2010 directly decreased from



**Fig. 1.** Domestic taekwondo research published



**Fig. 2.** Domestic taekwondo research published

23 in 2010 to 13, and increased sharply from 2011 to 2014, reaching the highest number of 25 articles. After rising from 2016 to 2017, it presents a straight downward trend until 2020. The growth of literature is more or less inseparable with China's large-scale competitions. In the 2012 London Olympic Games, China achieved a good result of one gold, one silver and one bronze.

### 3.1.2 Analysis on the Characteristics of Foreign Taekwondo Research Publications

Foreign ones are shown in Fig. 2.

The number of taekwondo studies published abroad is not stable from 2010 to 2020, with a slow growth, the number of published in 2010 and 2011 showed a trend of rapid rise, slightly decreased from 2011 to 2012, and slowly increased from 2012 to 2018, among which the number of published in 2013 to 2016 has maintained 25. After a slight decrease in 2018, it slowly increased until it reached the maximum value of 33 articles in 2020. Taekwondo literature increased in 1996, 2008, and 2016.

### 3.1.3 A Comparative Analysis of the Characteristics of Taekwondo Research Publications at Home and Abroad

From the total number of taekwondo publications at home and abroad, we can clearly see that the domestic literature slightly presents a downward trend, while the foreign literature presents an upward trend, and the total number of foreign publications is significantly higher than the domestic literature. Annual data published at home and abroad are largely influenced by major competitions and sports policies.

I think there are the following factors for the growth of taekwondo periodicals. First, the taekwondo research Institute has increased its expenditure and research staff. With the popularization and promotion of taekwondo sport, not only the number of taekwondo researchers and researchers in schools has increased, but also the participation of taekwondo coaches and researchers is urgently needed as part of competitive sports. Second, the expansion and subdivision of taekwondo competitions. From China in the

history of the sport, can know from the start, tae kwon do is against athletic competitions comprehensive sports, along with the progress and development of world economy, our country tae kwon do project also rapid accumulation and development, the people also won the broad masses of the people love, development and the progress of Chinese public taekwondo is very need education scientific research and technical support. Third, inter-disciplinary infiltration. The development of a sport can cover many fields of scientific research. For competitive sport, the teaching and research of taekwondo can cover many fields, including sports physiology, sports biomechanics, sports anatomy and sports sociology. With the continuous progress and development of Chinese taekwondo sport, the scope and perspective of research involved are expanding. Fourth, the dissemination of scientific research achievements in taekwondo. The dissemination of scientific achievements in taekwondo. In this rapidly developed information society, this promotes taekwondo science and technology achievements to be used for reference and application, in order to promote the sustainable and healthy development of taekwondo sports. In addition, the coordination and organization of research work, the improvement of the efficiency of research results, and the innovation and improvement of communication technology are also considered to be an important factor for the substantial increase of the literature related to taekwondo.

## **3.2 Analysis of Taekwondo Universities and Cooperation at Home and Abroad**

### **3.2.1 Analysis of Domestic Taekwondo Universities and Cooperation**

Through Citespace, the data of collaborative cooperation between taekwondo universities are imported respectively. Because the software analysis is in Chinese, it is described in words here.

We can see clearly, at present our country taekwon do research in colleges and universities were demonstrated in the network map, on the whole, is a decentralized state, the attachment is relatively small, and a group of local team, this also explains our country taekwon do scientific research colleges and universities is not able to form a strong mass exchanges and cooperation, the existing communication intensity is not high also. From the color of the connecting line, orange and red are rare, which indicates that the vast majority of the cooperation is in the past few years, which indicates that the cooperation between various universities in China has yet to be strengthened. From this picture, we can clearly see that there are many sports cooperation with foreign universities from Beijing Sport University, Hebei Institute of Sport and Wuhan Institute of Sport.

At the same time, it is found that colleges and universities are in the majority, especially sports colleges and universities. Through the further analysis of the cooperation network among universities, it can be seen that the cooperation among universities in Taekwondo research in China is not close, and there is no large-scale cooperation map, which is indispensable to the different resources among universities and the level of scientific research expenses. In addition, with the development of society, exchanges and cooperation between universities are gradually enhanced. One of the important driving forces for the development of science and technology is scientific research cooperation, which can not only enhance the overall strength of scientific research teams, but also effectively promote the knowledge exchange among authors, institutions and countries.

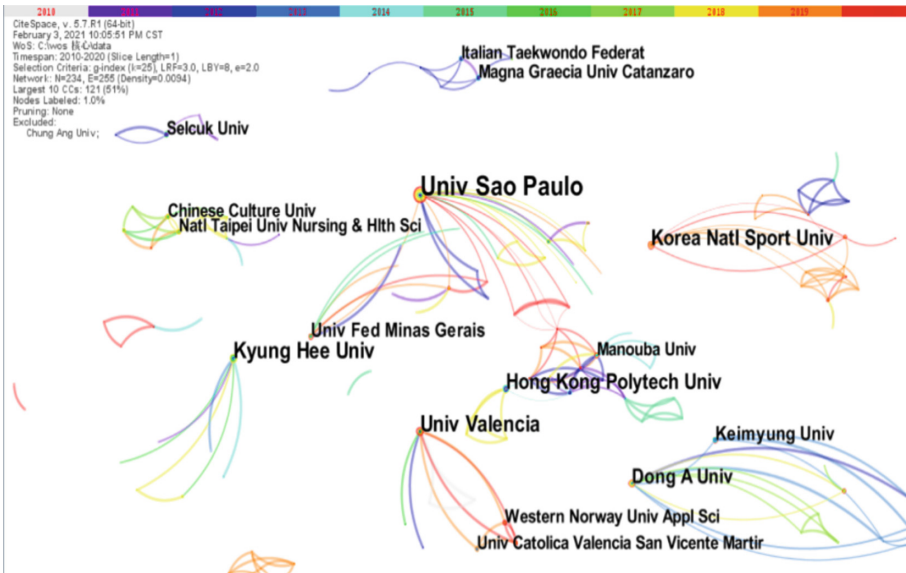


Fig. 3. Cooperation atlas of foreign universities

### 3.2.2 Analysis of Cooperation Among Foreign Taekwondo Universities

Through CiteSpace, foreign data will be imported from the software respectively into Fig. 3.

We can clearly know that, and seeing taekwon do foreign studies university jointly developed a map as a whole is to present a state of partial dispersion, the attachment is relatively more, the attachment is fine, and there are some local medium group, this also means that the foreign taekwon do research in colleges and universities, though not able to form a strong mass communication, but not noted in the existing communication strength thin. From the point of view of the color of the connecting wires, the color of most connecting wires is fairly evenly distributed, and orange and red are more, indicating that the cooperation with foreign universities is gradually strengthening.

We can clearly know that, and seeing taekwon do foreign studies university jointly developed a map as a whole is to present a state of partial dispersion, the attachment is relatively more, the attachment is fine, and there are some local medium group, this also means that the foreign taekwon do research in colleges and universities, though not able to form a strong mass communication, but not noted in the existing communication strength thin. From the point of view of the color of the connecting wires, the color of most connecting wires is fairly evenly distributed, and orange and red are more, indicating that the cooperation with foreign universities is gradually strengthening.

### 3.2.3 Comparative Analysis of Cooperation Between Taekwondo Colleges and Universities at Home and Abroad

Through the comparative analysis of universities and colleges at home and abroad, the following characteristics are found:

First of all, science and R&D universities at home and abroad are all universities. High-yielding universities in China are mainly specialized sports universities, while high-yielding universities abroad are mostly comprehensive universities. Secondly, in terms of the cooperation between colleges and universities, although there is some cooperation on the whole, it still needs to be further strengthened, especially the domestic cooperation has declined in the past two years.

### 3.3 Research Hotspots and Frontier of Taekwondo at Home and Abroad

#### 3.3.1 Keywords Analysis of Domestic Research

Because the software analysis is in Chinese, Figure is described in words here and Table 1 is obtained.

**Table 1.** Domestic high frequency keywords and high school psychological keywords ranking list

ranking	keywords	The frequency of	keywords	centricity
1	Taekwondo	109	Taekwondo	0.69
2	Tactics	11	Tactics	0.1
3	The Olympic Games	7	The Olympic Games	0.07
4	Tactical	7	Boxing	0.06
5	Technology	6	Tactical	0.05
6	The new rules	6	Sports teaching	0.05
7	Elite athlete	6	Chinese martial arts	0.04
8	The electronic gear	6	Technology	0.03
9	Women's taekwondo	5	Mechanics principle	0.03
10	Competitive sports	5	World Taekwondo Championships	0.03
11	Taekwondo athlete	4	Rio Olympics	0.03
12	Martial arts	4	The new rules	0.02
13	Visual search	4	Elite athlete	0.02
14	Zhao Shuai	3	The electronic gear	0.02
15	Threat stimulus	3	Women's taekwondo	0.02
16	Man	3	College students'	0.02
17	The development trend	3	Hit the head	0.02
18	Excellent taekwondo athlete	3	The game	0.02
19	Mechanics principle	3	In anhui province	0.02
20	Characteristics of the	3	The empirical research	0.02

From the upper left corner of figure, We can see that the nodes are 255, the lines are 480, and the densities are 0.0108 respectively. The first 5 clusters are set in this table, and it is clear that the research of taekwondo is mainly competitive sport. The research objects include taekwondo athletes, middle school students, teenagers and so on. The research content includes techniques and tactics, sports training, biomechanics and sports theory, and the research mainly includes the current situation and the improvement of sports ability.

It can be clearly seen from Table 1 that the frequency of “Taekwondo” has reached 109, and the centrality is also in the first place, reaching 0.69. As taekwondo related journal literature takes Taekwondo as its research focus, the centrality and frequency need to be possessed. The frequency and centrality of “Tactics” ranked second, and the frequency and centrality of “Olympic Games” ranked third. Technical and tactical teaching is an important part of taekwondo curriculum research, which will directly involve the practice teaching of Taekwondo in Olympic Games, championships and competitions. As can be seen from the picture, scholars attach great importance to taekwondo techniques and tactics. There are many gold medalists in the recent Olympic Games in China, so researchers still pay more attention to the Olympic Games, so the Olympic Games aspect of the research scholars or more concerned. After that, the frequency of technology, tactics, new rules, excellent athletes and electronic protective gear is more advanced. Sports training points out that body, war, mind and intelligence are all components of physical strength. Athletes are the main body of taekwondo sports, and the protective gear is the prop of taekwondo competition.

### 3.3.2 Domestic Taekwondo Research Topic Evolution

Through the emergence and occurrence time of key words, we can know the development and evolution of taekwondo subject research hotspot. Citespace was used to process the keywords of domestic taekwondo research literature and draw the time-line atlas. Because the software analysis is in Chinese, figure is described in words here.

It can be seen Citespace arranges 5 clusters according to time line, in which are the keywords with high frequency and strong centrality in keyword clustering.

0 # “martial arts” clustering, first appeared in 2010, a journal paper keywords for “artificial ligament” shows that as early as in 2010, martial arts class has been attention by people, from 2013 to 2015, study more, keywords more intensive, research also relatively wide, education, sports management, sports have reflected, compared with other clustering set of keywords. 1# In the clustering of “New rules”, the first journal literature appeared in 2010, and the keyword was “Taekwondo competition”. In 2013 and 2017, no node appeared, but keywords such as new rules, electronic protective equipment, executive adjudicator, electronization, and winning scoring technology appeared. 2# In the clustering of “modified judgment”, the first journal literature appeared in 2010, with the keyword of “Guangzhou Asian Games Selection”. The research heat was relatively balanced, and keywords such as video review, element establishment, biomechanics, striking distance, and competition rules appeared one after another. 3# In the clustering of “techniques and tactics”, the first journal literature appeared in 2010, and the key word was “analysis”. The research keywords mainly focused on the Olympic Games, techniques and tactics, electronic protective equipment, referee, electronization, and winning



scoring technology, and no nodes appeared in 2018 and 2020. 4 # “outstanding athletes” clustering, first appeared in 2010, a journal paper keywords as “decision-making”, also have sports spirit, methods of key words, such as electric, junior talent, sports culture, and the clustering of research attention compared to other clustering, are relatively small, especially in the past two years, gradually cold heat.

### 3.3.3 Frontier Analysis of Domestic Taekwondo Research

Using the function of “Citation Burst History” in Citespace, the charts of the top 8 keywords with high Burst rate and development stages in core journals from 2010 to 2020 were obtained, as shown in figure. Because the software analysis is in Chinese, it is described in words here.

It can be clearly seen from figure that, for example, the frequency and change of the keyword “Taekwondo athlete” from 2010 to 2020 are relatively large, and the emergence rate is relatively high. Keywords “tactical” also had a relatively high burst rate, and “tactical” also had a relatively high burst rate. Keywords influencing the change rate also included “technology”, “excellent athletes”, “Rio Olympic Games”, “threat stimulus”, “visual search”, “event-related potential” and so on. This indicates that the changes of these keywords in future research are likely to be continuous and are the forefront of domestic research. Some keywords have not appeared much in recent years, but from the degree of emergence rate, there is an inevitable trend to continue research.

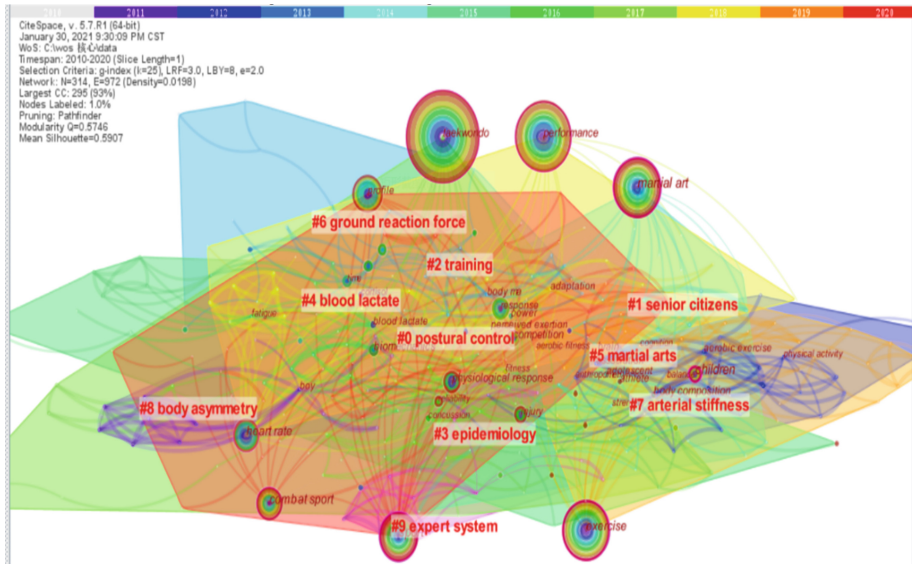


Fig. 4. Foreign taekwondo research keywords co-occurrence cluster atlas

**Table 2.** Foreign high frequency keywords and high school psychological keywords list

Ranking	Keywords	The frequency of	Keywords	Centricity
1	Taekwondo	83	Martial art	0.3
2	Performance	63	Sport	0.3
3	Martial art	57	Exercise	0.25
4	Exercise	47	Children	0.23
5	Sport	40	Taekwondo	0.17
6	Heart rate	33	Heart rate	0.14
7	Profile	28	Body composition	0.14
8	Combat sport	27	Combat sport	0.13
9	Children	20	Biomechanics	0.13
10	Physiological response	18	Performance	0.11
11	Competition	18	Physiological response	0.1
12	Response	17	Competition	0.1
13	Biomechanics	15	Injury	0.1
14	Injury	15	Boy	0.1
15	Time	12	Profile	0.07
16	Body composition	10	Adolescent	0.07
17	Reliability	10	Blood lactate	0.06
18	Blood lactate	10	Fatigue	0.06
19	Strength	10	Adult	0.06
20	Athlete	10	Time	0.05

### 3.3.4 Keywords Analysis of Foreign Taekwondo Research

Keywords co-occurrence and cluster analysis of 269 WOS journal core collections of Taekwondo studies from 2010 to 2020 were conducted using Citespace, and Fig. 4 and Table 2. Were obtained.

It is not difficult to see that the nodes of “Taekwondo”, “performance”, “martial art”, “exercise” and “sport” have relatively thick radius and various colors, which to a certain extent indicates that international taekwondo researchers have a lot of studies on these keywords. In the picture, children, boy, adolescent, athlete and Adult are among the most popular groups in international taekwondo. The international taekwondo research finally focuses on the performance of taekwondo, and the research hotspot involves physiology and biomechanics, injury and physical fitness. Table 2 shows the top 20 words of taekwondo keyword word frequency and centrality.

From Table 2, it can be seen clearly that “Taekwondo”, as the subject of this research, has the highest frequency of 83, with a slightly lower centrality of 0.17, ranking the fifth. The frequency of “performance” only ranks the second, it can be clearly seen that the ultimate goal of taekwondo discipline research is mostly the performance of taekwondo

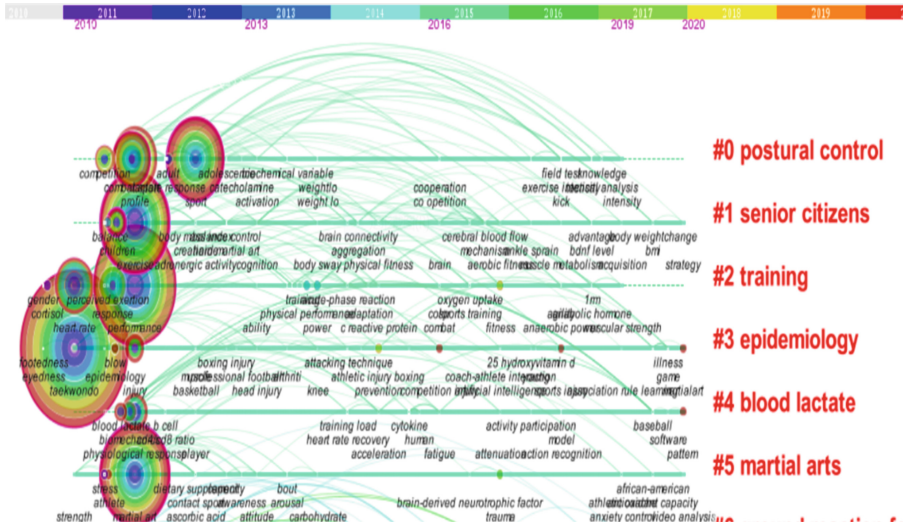


Fig. 5. Foreign taekwondo research keywords time line atlas

sport, and its research purpose is to greatly improve the performance of sport, martial art is listed as the third frequency, with a center of 0.14, Taekwondo and martial arts have a great relationship, so the frequency and centrality of this period are relatively high. Word frequency of exercise ranked fourth and centrality third. Words with high frequency and centrality include heart rate, children, profile, etc. In terms of exercise physiology, such as blood lactate, heart rate, and Fatigue, studies on exercise physiology occupy a large position in the international taekwondo field.

3.3.5 The Evolution of Foreign Taekwondo Research Topics

Through the time chart of this keyword, we can know the historical evolution of foreign taekwondo academic research and development hot spots. Citespace was used to analyze and process keywords in foreign taekwondo related studies. The results are shown in Fig. 5.

It can be seen from Fig. 5 that Citespace arranges 8 clusters according to time line, in which are the keywords with high frequency and strong centrality in keyword clustering.

In 0# “Postural control” clustering, keywords in this category include competition, weight, Vanable, cooperation, intensity, etc. There are not too many clustering keywords, especially in 2015 and 2017, there are no nodes. 1# In the cluster of “senior citizen”, the keywords in this category include balance, brain connectivity, aggregation, cerebral blood flow, etc., and the time keywords are evenly distributed. 2# “Training” cluster, such clustering keywords include heart rate, oxygen uptake, combat, fitness, etc. Since 2011 and 2012, there has been no node, and the research focus has been gradually increasing. 3# in the cluster of “epidemiology”, the key words in the study were Boxing injury and illness, and it could be seen from these graphs that the distribution was fairly uniform. 4# In the cluster of “blood lactate”, keywords in this category include Physiological

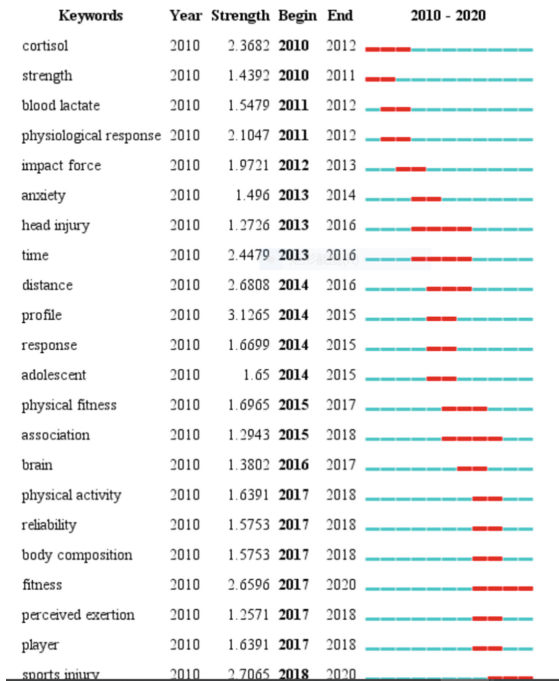


Fig. 6. Keywords of high emergent rate and development stage map

Response, Training load, cytokine, and fatigue. As can be seen from the graph, the research focus of this category was not high at the beginning, but it has increased a little in recent years. 5# “martial arts” cluster, the keywords in this category include strength, athlete, arousal, awareness, etc.

### 3.3.6 Research Frontier Analysis of Foreign Taekwondo Research

Keywords historical stage diagram, as shown in Fig. 6.

It can be clearly seen from Fig. 6 that keywords “head injury”, “time”, “associations”, “fitness” had high frequency changes and their emergence rate; The incidence rate of the keyword “tactics” is very high. From this figure, we can clearly see that cortisol, Distance and sport injury, as well as blood lactate and Physiological R, have a high rate of change so far “Esponse”, “Perceived Exertion”, “anxiety”. This indicates that these keywords are likely to be the research frontiers in the future. There are also many keywords related to sports physiology and sports injury. From the point of time of emergence, there are more studies on sports injury in recent years, but few on techniques and tactics.

### 3.3.7 Comparative Analysis of Research Hotspots and Frontiers at Home and Abroad

There is still a certain gap between Our country and foreign countries, domestic taekwondo field research is mainly in competitive sports more prominent. The research

objects include taekwondo athletes, college students and teenagers, etc. The research scope includes techniques and tactics, sports training, biomechanics and sports theory, etc. The research paradigm mainly focuses on the status quo and the improvement of sports performance. Children, boy, adolescent, athlete and Adult are the hot research groups in international taekwondo. Taekwondo often takes martial art as the object of its comparative study. Most of the international taekwondo studies are on taekwondo performance, physiological mechanism and other aspects. The research focus mainly includes sports injury, physiological response, appearance, body composition and so on. In the research literature of taekwondo, the first concern is that “taekwondo tactics” and “competition” serve for competitive sports. At the same time, taekwondo is studied from the perspectives of “technical and tactical analysis”, “training methods”, “competition rules” and “biomechanics”. Foreign studies on the heart rate of taekwondo theme are relatively early, followed by studies on taekwondo exercise. Research on the physiology of sports injury and other sports substances is still ongoing and will still become an important scientific research topic.

Finally, in terms of research frontiers, many domestic and foreign research frontiers are also quite different. The research frontiers in Korea are “technique,” “tactics,” and “taekwondo athletes,” which are key words for direct taekwondo competitions and training. Among them, “threat stimulus,” “visual search,” and “event-related potential” are also attracting researchers’ attention recently. Most international taekwondo studies are related to head injury, Time, associations and fitness, including sports injury, physiological characteristics, physiological reactions and striking distance.

## 4 Conclusions

Domestic taekwondo research literature basically shows a downward trend, while foreign taekwondo research literature mostly shows an upward trend. The total number of foreign publications is higher than that of domestic publications, and will continue to rise.

The number of publications published by colleges and universities in China is relatively concentrated, most of which are sports and related specialized journals; The proportion of scientific research and cooperation in foreign countries is relatively larger than that in China. The domestic universities are mainly specialized sports colleges, while most of the high-yielding sports colleges in foreign countries are comprehensive sports colleges. Coordination and cooperation among various organizations need to be strengthened.

The main subjects of domestic research hotspots include technology and tactics, taekwondo athletes, sports teaching and new rules. Foreign research and development focus mainly on sports performance and physiological characteristics. Generally speaking, the development process of domestic research hotspots is from competitive sports to school sports and then into competitive sports, while the theme of foreign research extends from sports injury to taekwondo technology and then into sports physiology.

The domestic research frontier is taekwondo technique and tactics and excellent athletes, while the foreign research focuses on physiological and sports injuries, body composition and appearance.

## 5 Suggestions

In the direction of the taekwon do scientific research subject, we should focus on the core of experts, the author of the journal, high frequency, and other related scholars and organizations in colleges and universities, mutual exchanges and cooperation, draw the cross subject knowledge and technology, at the same time make full use of all kinds of sports colleges and universities school taekwondo in the direction of scientific research resources and the environment, to enhance the comprehensive sports The level of taekwondo research in sex universities and other normal universities.

They should further enhance their international vision, write high-quality research papers related to taekwondo, actively promote their cooperation with domestic and foreign countries, and submit their papers to international platforms to enhance their international influence in taekwondo related research.

Domestic scholars should actively pay attention to the study of taekwondo sports physiology and mass sports, and at the same time, they can learn from the study of sports injury abroad. In addition, the study of taekwondo children, adolescents and adults should not be ignored.

## References

1. Shang, Y. Q., Chen, L. R. (2002) Review of research status of taekwondo in China. *Journal of Beijing Sport University*, 605–607.
2. Zhang, Z. Q. (2000). Thesis dedicated to metrology. *Journal of Inner Mongolia Teachers College for Nationalities Natural Science edition*, 176–177.
3. Yang, Q. Q., Li, Y. C. (1998). *Information scientific and technical*. Academic Press, Beijing.
4. Yang, G. Z. (2020). Research on the characteristics, evolution path and hot topics of taekwondo research in China. Based on citespace analysis of CNKI database. *Martial Arts Studies*, 72–76.
5. Chen, X. P. (2007). On the main problems existing in the special sports training and the countermeasures of sports science. 27, 72.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

