



Analysis of COVID-19 Research Status in the Field of Traditional Chinese Medicine from the Perspective of Bibliometrics

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Abstract. Objective: To explore the research status, theme changes and regular characteristics of novel coronavirus in the field of traditional Chinese medicine. Methods: Chinese and English literatures related to COVID-19 in the field of traditional Chinese medicine were retrieved, and the contents of the articles were clustered and analyzed. Results: There were 4,326 Chinese and 1,040 English documents which met the requirements, and the time span was from January 1, 2020 to June 16, 2022. Conclusion: The research topics of TCM are characterized by stages, close cooperation among research groups, and the degree of integration of traditional Chinese and western medicine is gradually increasing, but there are still some deficiencies in the dissemination.

Keywords: COVID-19 · Traditional Chinese medicine · Bibliometric · Visual analysis · VOS viewer

1 Introduction

Novel coronavirus pneumonia is an acute respiratory infectious disease caused by novel coronavirus. As of July 16, 2022, according to official data, the number of confirmed cases in China has reached 4787922. With the repeated outbreak of COVID-19, TCM medical staff and experts from all over China play an active role in disease prevention and treatment and articles and reports in the field of TCM continue to emerge. This paper uses VOS viewer software to co-exist and cluster analyze the research hotspots in the field of traditional Chinese medicine discovering the characteristics of traditional Chinese medicine research, and providing suggestions and references for the research in the field of traditional Chinese medicine in public health emergencies.

2 Research Purpose and Significance

2.1 Research Purpose

Yuefen Wang [1] analyzed the characteristics and development trend of Modern Library and Information Technology by studying its publishing characteristics in the past

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10 years. Yu Zhang [2] found that the current research focuses mainly on the etiology and pathogenesis of new coronavirus pneumonia, TCM syndromes, prevention and treatment, the mechanism of Chinese medicine, the screening of antiviral drugs and the discussion of the integration of traditional Chinese and western medicine through the analysis of the current research status of traditional Chinese medicine for new coronavirus pneumonia. Li Song [3] found the United States and other developed countries have more research results in the field of ICC. China is in the stage of exploration and development, and the number of studies is relatively small. Yuxin Wang [4] found that the focus of Chinese medicine epidemic prevention policy was different in different periods of time by using bibliometric methods. For example, in the early stage, he focused on nucleic acid detection in the late stage of reproduction, and finally tended to normalized prevention and control. Yiwen Li [5] explored the role of clinical application of TCM in epidemic prevention and control through bibliometric. Zhiwei Zhou [6] found that the research focus of the new coronavirus pneumonia mainly focused on the understanding of the etiology and pathogenesis of the new coronavirus pneumonia, the mining of the law of drug use, the research of the mechanism of traditional Chinese medicine against the new coronavirus, and the clinical trial of traditional Chinese medicine in treating the new coronavirus pneumonia. Ting Liu [7] discussed the research characteristics of new coronary pneumonia in the nursing field. Wenyang Peng [8] believed that the relevant literature on the prevention and treatment of new type coronavirus pneumonia with traditional Chinese medicine was published rapidly, but the breadth and depth of research content needed to be further improved. This paper intends to analyze the research contents of Chinese scholars in the field of traditional Chinese medicine during the outbreak of COVID-19 by bibliometrics, reveal the evolution law of the main research contents, and discuss how to popularize traditional Chinese medicine and discover the research laws of public health emergencies.

2.2 Research Significance

2.2.1 Provide Suggestions for Promoting the Development of Chinese Medicine in China

Taking the articles published in Chinese and foreign databases by Chinese researchers in the field of traditional Chinese medicine since the outbreak of COVID-19 as the research object, this paper analyzes the evolution of the main body and key words of the articles, discusses the changes of the focus points in relevant research in COVID-19 and the aspects that are easily overlooked, summarizes the research rules of Chinese traditional medicine in COVID-19, and provides some reference opinions on the promotion of Chinese traditional medicine and the cooperation between Chinese and Western medicine.

2.2.2 Post Trends and Major Events Complement Each Other, and Explore the Law of COVID-19 Research

By combing the trend of articles published by Chinese scholars in the field of traditional Chinese medicine since the outbreak of COVID-19, combining with various representative events during the period, based on the research of public emergencies, taking

the COVID-19 event as the breakthrough point, and based on objective data, this paper makes quantitative analysis on the characteristics and subjects of articles published in different periods, so as to discover the research law of public health events in the field of traditional Chinese medicine and provide reference for other public health events.

3 Data Sources and Research Methods

Chinese literature in this paper is selected from CNKI and Wan Fang database, and the search start date is January 1, 2020. As of June 2022, the search formula is $SU = 'novel\ coronavirus' + 'novel\ coronavirus' + 'COVID-19' + 'Covid-19' + 'NCP' + '2019-NCOV' + 'SARS-CoV-2'$ and $SU = 'TCM' + 'TCM' + 'TCM' + 'TCM\ treatment' + 'TCM\ prevention'$. A total of 4326 qualified Chinese documents were obtained through institutional screening and manual removal of invalid documents such as non-authored documents, meetings, interviews, leaders' speeches, and re processing. Web Of Science and Pubmed databases are selected for English literature. The search formula is $TS = ("COVID-19" OR "ncp" OR "2019\ nCoV" OR "SARS\ CoV-2") AND TS = ("Traditional\ Chinese\ Medicine" OR "TCM" OR "Chinese\ medicine" OR "Chinese\ medical\ herb" OR "Chinese\ medical\ herb" OR "Chinese\ herb" OR "Chinese\ patient\ drug")$. A total of 1040 English literatures that meet the requirements are screened.

The retrieved documents are exported in Endnote format, and the documents are imported into EndnoteX9 software for format conversion and then imported into VOS viewer software. The data statistics and charts are drawn by VOS viewer and Excel spreadsheet software, and the research authors, publishing organizations, keywords and other information of the documents selected from four groups of databases are digitized for subsequent visual analysis.

4 Retrieval Data Analysis

4.1 Trend Analysis of Posting

From the analysis of the above-mentioned retrieval data, we can get the posting trend (as shown in Fig. 1 and Fig. 2). It can be seen that from January 2020 to December 2020, the posting volume of Chinese and English databases is in a high stage, and from January to April 2020, the posting volume of Chinese and English databases has a big peak, mainly due to the outbreak of COVID-19 and the concentrated posting of various experts and scholars. From December 2020 to December of the same year, before the emergence of Mystic Keron strain, the epidemic situation in COVID-19 in China was good and stable. The epidemic situation in COVID-19 was mainly concentrated in foreign countries, and the number of articles published in English was increasing, while the number of articles published in Chinese and English databases was stable. From December 2021 to May 2022, both Chinese and English databases fluctuated slightly. On the one hand, the mysterious Keron strain appeared in this period, and a large-scale epidemic broke out in Tianjin, Changchun, Shanghai and other places in China. On the other hand, Chinese scholars in the field of traditional Chinese medicine gradually improved and deepened their research on COVID-19.



Fig. 1. Trend chart of Chinese database posting

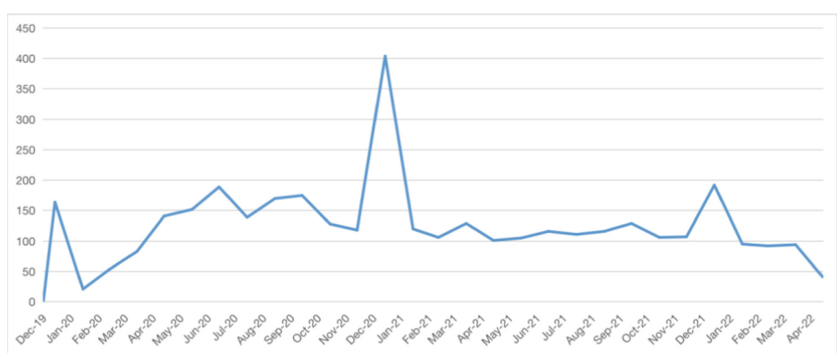


Fig. 2. Trend chart of English database posting

4.2 Theme Evolution

Through the analysis of the publishing trend, it is found that it is characterized by stages, and the collation of keywords can be roughly divided into three stages (see Table 1). The first stage is from January 2020 to December 2020. At this stage, due to the outbreak of the epidemic, the state quickly introduced a diagnosis and treatment plan to guide the fight against the epidemic. Universities and hospitals quickly responded to COVID-19, and conducted research from the pathological mechanism of the virus, diagnosis and treatment plan and other directions. There was a correlation between the research hotspots, and the research was systematic and highly concentrated. The number of related papers continued to grow rapidly. The article mainly focuses on the understanding of novel coronavirus, the infectivity of the virus, the diagnosis and preliminary treatment of COVID-19, and the key words are Chinese medicine, epidemic disease, Chinese medicine therapy, syndrome differentiation and treatment, network pharmacology, etc. This stage can be regarded as the early stage of COVID-19. The second stage is from January 2021 to December 2021. With the development of epidemic

Table 1. Keyword list of Chinese database and English database

Chinese database (1)			English database (1)		
Rank	Key word	frequency	Rank	Key word	frequency
1	Novel coronavirus pneumonia	1039	1	COVID-19	71
2	Traditional Chinese Medicine	247	2	sars-cov-2	51
3	New coronary binding	234	3	humans	43
4	COVID-19	117	4	pandemics	26
5	blight	96	5	traditional Chinese medicine	22
6	Dialectical governance	76	6	medicine Chinese traditional	21
7	TCM Therapy	71	7	coronavirus infections drug therapy	16
8	Wuhan Pneumonia	69	8	pneumonia viral drug therapy	16
9	network pharmacology	67	9	china	16
10	traditional Chinese medicine	63	10	drugs Chinese herbal therapeutic use	16
11	plague	62	11	pathogenesis&pharmacy	16
12	Chinese medicine	56	12	betacoronavirus	15
13	pneumonia	54	13	integrative&complementary medicine	14
14	Diagnosis and treatment plan	52	14	2019-ncov	13
15	Combination of Chinese and Western Medicine	50	15	pneumonia	11
Chinese database (2)			English database (2)		
1	Novel coronavirus pneumonia	1437	1	COVID-19	498
2	COVID-19	387	2	humans	291

(continued)

Table 1. (continued)

Chinese database (1)			English database (1)		
3	New coronary binding	298	3	sars-cov-2	284
4	novel coronavirus	200	4	traditional Chinese medicine	203
5	blight	136	5	pharmacology&pharmacy	122
6	Chinese medicine	114	6	pandemics	88
7	network pharmacology	92	7	general&internal medicine	85
8	traditional Chinese medicine	73	8	coronavirus	84
9	data mining	72	9	network pharmacology	73
10	pneumonia	71	10	treatment outcome	71
11	plague	70	11	male	61
12	Combination of Chinese and Western Medicine	70	12	medicine	61
13	Clearing lung and expelling toxin	69	13	female	59
14	Law of medication	68	14	drugs, Chinese herbal	57
15	convalescence	66	15	china	53
Chinese database (3)			English database (3)		
1	Novel coronavirus pneumonia	73	1	COVID-19	12
2	traditional Chinese medicine	33	2	traditional Chinese medicine	10
3	COVID-19	24	3	pharmacology&pharmacy	7
4	Novel coronavirus pneumonia	10	4	network pharmacology	6
5	blight	8	5	sars-cov-2	6
6	TCM Therapy	7	6	tegrative&complementary mdicine	5
7	convalescence	7	7	molecular docking	4
8	Combination of Chinese and Western Medicine	7	8	systematic review	4
9	Omicron mutant	6	9	biochemistery&molecular biology	3
10	Expert consensus	6	10	herbal medicine	3

(continued)

Table 1. (continued)

Chinese database (1)			English database (1)		
11	Epidemic prevention and control	6	11	protein	3
12	network pharmacology	6	12	coronavirus	3
13	molecular docking	6	13	inflammation	3
14	Chinese medicine	6	14	in-vitro	3
15	Etiology and pathogenesis	5	15	mechanism	2

situation and in-depth research, the related literature of integrated traditional Chinese and western medicine emerges one after another. At the same time, the mainstream problems have shifted to the direction of antiviral drugs and vaccines. This paper discusses the treatment of COVID-19 with traditional Chinese medicine through drug pharmacology, medication rules and virus prevention. The key words are the combination of traditional Chinese and western medicine, network pharmacology, pharmaceutical pharmacology, medication regularity, recovery period, prevention of disease, etc. The ranking is rising, and this stage can be regarded as the middle stage of COVID-19. The third stage is from January 2022 to June 2022. In this stage, the epidemic situation fluctuates again, and the Covid-19 constantly mutates, forming the Omicron virus with higher infectivity. The theme of prevention and control of epidemic situation rises, which reflects that people are gradually moving towards the normalization of epidemic prevention and control. At the same time, the number of articles published in this stage is much lower than that in the previous two stages, and the research on COVID-19 in the field of traditional Chinese medicine has gradually matured, and its popularity has declined. In terms of keywords, the ranking of keywords such as Omicron virus, prevention and control, epidemic prevention and control, and expert consensus rose. This stage can be regarded as the end of COVID-19.

5 Research Conclusions

5.1 Research Conclusion

(1) The research topic is characterized by stages

According to the trend of articles published in Chinese and English databases in each month, the trend chart of articles published is drawn, and the peak and fluctuating stages of articles published are judged according to the peak and valley of the trend chart, and the landmark events are searched according to the time nodes of the peak and valley. Then, the changes of key words and articles published are analyzed, and it is found that there are three stages in the related research of Chinese traditional medicine scholars in COVID-19. From January 2020 to December 2020, COVID-19 broke out for the first time, and experts and scholars actively carried out research. During this period, both

Chinese and English databases were in a high volume of published articles, and the main research contents in this stage were diagnosis and treatment methods, pathological mechanisms and so on. From January, 2021 to December, 2021, the epidemic situation of COVID-19 in China was under control and showed a steady state, and the number of articles published in Chinese and English databases showed a steady trend. At this stage, the main research contents changed to new research hotspots such as network pharmacology, pharmaceutical pharmacology, medication rule, recovery period, prevention of disease, etc., and the mainstream social issues shifted to antiviral drugs and vaccines. From December 2021 to June 2022, new pneumonia strains such as Omicron appeared in China, and small-scale outbreaks occurred in many places. Both Chinese and English databases fluctuated slightly. During this period, epidemic prevention and control, disease recovery, integration of traditional Chinese and western medicine, and expert consensus became hot topics in research. The focus of the whole research process has changed from studying and understanding COVID-19, discussing the means of diagnosis and treatment to the law of medication, discussing the pathological mechanism, and then how to prevent and prevent the epidemic. With the epidemic situation, the number of articles published has also gone through a process from peak to decline. The research on COVID-19 in the field of traditional Chinese medicine has gone through a relatively complete stage.

- (2) The combination of traditional Chinese and western medicine has become a research trend

Through the integration of keywords in different periods, it is found that the frequency ranking of the keyword “combination of traditional Chinese and western medicine” gradually rises in the second and third stages. On the one hand, experts gradually recognize that the combination of Chinese and Western medicine is a powerful way to treat COVID-19, which reflects the urgent need for Chinese medicine and Western medicine to break through their respective limitations and reach a consensus to protect people’s lives and health; On the other hand, traditional Chinese medicine itself plays an important role in the treatment process. For example, in the early stage of new crown pneumonia, Wuhan epidemic situation adopted the strategy of flooding Chinese medicine decoction, giving Chinese medicine adjuvant treatment to severe patients, and in the recovery period of patients, Chinese medicine physiotherapy method promoted patients’ recovery and reduced sequelae, which further promoted the speed of integration of traditional Chinese and western medicine. The National Health and Wellness Commission has successively issued a total of eight editions of “novel coronavirus Diagnosis and Treatment Plan”, and since the third edition, it has joined the TCM diagnosis and treatment plan. Since then, the importance of integrated Chinese and western medicine treatment, the consultation and patrol system of integrated Chinese and western medicine, and the establishment of traditional Chinese medicine shelter hospital have increased. Giving full play to the advantages of traditional medicine, further clarifying the effectiveness of traditional Chinese medicine and deepening the integration of traditional Chinese and western medicine are still important contents of epidemic prevention and control.

(3) The research and dissemination of traditional Chinese medicine is insufficient

Since the outbreak of neopneumonia, CNKI and Wanfang have published 4,326 articles in the research related to COVID-19 in the field of traditional Chinese medicine, and Web of Science and Pubmed have published 1,040 articles, the number of which is much larger in Chinese than in English. In addition, the cooperation among publishing institutions is mainly between domestic Chinese medicine universities and affiliated hospitals, and there are few cooperation links with foreign medical institutions. Besides the objective factor of language, the total resources of TCM are low, and the high-level talents and institutions of TCM are relatively insufficient. There are differences between western medicine and traditional Chinese medicine in the study of pathological mechanism of diseases, and different concepts lead to the difficulty of cooperation. The traditional mode of TCM education is teacher-led education, which has certain limitations in its development and popularization. After the 1950 s, advanced courses of TCM were held all over the country, and TCM courses were gradually added to undergraduate medical education, which resulted in a systematic late start compared with the development of western medicine. In the context of epidemic prevention and control, how Chinese medicine can enhance its influence in the international arena remains to be studied.

6 Summary

The research results show the current research hotspots and possible trends in the future. The prevention and control of epidemic situation is always the key issue, and the role of TCM diagnosis and treatment and prevention of disease in epidemic prevention in COVID-19 can not be ignored. The combination of traditional Chinese and western medicine and the research and development of anti-Covid-19 drugs may be the focus of people's attention in the future. In the study of other public emergencies, it may also present the stage characteristics similar to those of COVID-19. There is still an urgent need to popularize traditional Chinese medicine. In addition, at present, the epidemic situation is repeated, so domestic and foreign scholars should strengthen cooperation, expand the development of TCM diagnosis and treatment knowledge in foreign databases, dig deeper, and jointly seek effective means of TCM prevention and treatment of COVID-19, so as to control the further development of the epidemic situation, and promote the traditional TCM theoretical system to internationalization while giving full play to the role of TCM diagnosis and treatment. In addition, due to the large gap between Chinese and English literature, there may be some deviations caused by large quantity differences in the comparison process, which leads to some limitations in this paper.

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