

Analysis on the Changes of Research Hotspots in the Prevention and Treatment of COVID-19 by Traditional Chinese Medicine Based on Knowledge Graph

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Abstract

Objective: To grasp the changing trend of research hotspots of traditional Chinese medicine in the prevention and treatment of COVID-19, and to better play the role of traditional Chinese medicine in the prevention and treatment of COVID-19 and other diseases. **Methods:** The research literature from 2020 to 2022 was searched in the CNKI database, and CiteSpace software was used for visual analysis. **Results:** The papers on the prevention and treatment of COVID-19 by traditional Chinese medicine changed from cases, overviews, reports, and efficacy studies to more in-depth mechanism research, theoretical exploration, and social impact analysis, and finally formed a theory-clinical-society Influence-institutional change and other multi-dimensional achievement systems. **Conclusion:** Analyzing the changing trends of TCM hotspots in the prevention and treatment of COVID-19 can fully understand the important value of TCM, take the coordination of TCM and Western medicine as an important means to deal with public health security incidents, and promote the exploration of the potential efficacy of TCM, so as to enhance the role of TCM in Applications in social stability, emergency security, clinical practice, etc.

Keywords

Traditional Chinese Medicine, COVID-19, Epidemic Disease, CiteSpace, Knowledge Graph

1. Introduction

Since the outbreak of the global novel coronavirus pneumonia at the end of

2019, traditional Chinese medicine has played an important role in the prevention and response to the new crown pneumonia and emergency prevention and control. In the process of epidemic prevention and control, according to the characteristics of the disease, regional differences, and the degree of symptoms, “three medicines and three prescriptions” and recommended diagnosis and treatment plans have been formed, which has effectively alleviated the shortage of medical resources [1]. In terms of the hierarchical and hierarchical mode of responding to epidemic diseases, the idea of hierarchical prevention and control of traditional Chinese medicine (TCM) has been explored from multiple dimensions, such as patients in designated hospitals, quarantined people in isolation points, and social populations [2]. Through the establishment of a treatment system of “moving the threshold forward, deeply intervening, and participating in the whole process”, the practice of TCM participation in epidemic prevention and control has achieved outstanding results [3] [4]. Traditional Chinese medicine (TCM) has a definite effect on the prevention and treatment of COVID-19 [5] [6] [7] [8], which can significantly prevent mild cases from becoming severe, improve symptoms, shorten the course of the disease, improve the clinical cure rate, and reduce the case fatality rate. Studies have shown [9] that TCM can regulate inflammatory damage in multiple targets, act on viral proliferation, reduce the production of pro-inflammatory factors, increase the secretion of anti-inflammatory mediators, effectively regulate immune cell function, and promote body recovery.

However, from the scientific and theoretical research and clinical law summary of traditional Chinese medicine in the prevention and treatment of new crown pneumonia to the prevention and treatment of new crown pneumonia and even similar epidemics, the comprehensive summary research is not deep enough. Therefore, it is considered to analyze the literature on the prevention and control of the new crown in traditional Chinese medicine by drawing a knowledge map, and analyze the changes in its research hotspots, so as to provide ideas for better research on the basic theory and clinical practice of traditional Chinese medicine in the prevention and treatment of new crown, and to help the public understand traditional Chinese medicine more objectively.

2. Materials and Methods

2.1. Literature Sources and Retrieval Strategies

The research subjects were journal articles related to the prevention and treatment of COVID-19 in the China National Knowledge Infrastructure (CNKI) database. The search setting conditions are as follows: the search query is “(主题: 新冠疫情 + 新冠肺炎 + 新型冠状病毒肺炎(精确)) AND (主题: 中医药(精确)) AND (主题: 预防 + 治疗 + 防治(精确))”, The journal type is limited to academic journals. The search period was from 1 January 2020 to 31 December 2022. In the search strategy, the two search terms “新冠疫情” and “新冠肺炎” used in the search query are related and different, the former is referred to as “新

冠疫情” in the early stage of the epidemic, and the actual meaning also includes the meaning of “新冠肺炎” in the latter. In the joint analysis of Chinese contributions, due to the prominent extraction and analysis of the clustered subject headings in 2020 by the software, the relevant information of 2021 and 2022 did not appear, so the search time was adjusted, the literature search of 2021 and 2022 years was carried out separately, and the two-year keyword clustering vocabulary was combined and analyzed with the data of 2020. After the CNKI search, the literature was screened, and the screened literature was selected and exported and processed by software. Inclusion criteria: Literature that meets the theme of TCM prevention and treatment of new crown pneumonia, and literature that can view the full text. Exclusion criteria: Literature in which the subject or keyword of the literature does not appear “中医药” and “新冠肺炎”, notices, and related literature that does not match the meaning of the topic. There are many patients with COVID-19, and traditional Chinese medicine is widely used in China and has strong timeliness, so it is considered to choose the CNKI database with relatively higher literature quality. On the basis of bibliometrics, this paper also uses the content analysis method to analyze the latent and internal information of the research object to a certain extent, and try to extract the characteristics of the theme that can better reflect the prevention and treatment of new crown pneumonia in traditional Chinese medicine. After sorting out and sorting out the important information of each part, the final discussion is made based on the results obtained.

2.2. Research Methods

The tools used in this article are CITESPACE 6.1.6.0. The software is a visual tool developed by Professor Chen Chaomei University of the United States and used for scientific literature analysis [10]. It can effectively discover the context and trend of the development of a research field. The parameters of the application software are as follows: The shear method is selected to set “Purning the Merged Networks”. The scope of time slicing is from January 2020 to December 2022. The single-time section is set to 1 year. The keyword cluster algorithm is “LSI”. The remaining parameters are the default value. In this paper, the retrieved literature was analyzed through bibliometric analysis, and the relevant visual maps were obtained for analysis after software processing.

3. Results Section

A total of 1417 journal articles were searched in CNKI, 357 articles were excluded from the topic of TCM prevention and treatment of new coronary pneumonia, 1060 articles were included in the literature that needed to be processed, and 1046 valid documents within the range of time slice were obtained after the literature data were converted and processed by Citespace software.

Among them, the literature published in 2021 and 2022 was searched sepa-

rately. In 2021, 327 articles were obtained according to the retrieval strategy, and 98 articles unrelated to the topic of TCM prevention and treatment of new crown pneumonia were excluded after manual screening, 229 articles were included for software processing, and a total of 227 valid literature recorded within the scope of time slice were obtained. In 2022, 203 articles were obtained according to the retrieval strategy, 66 articles unrelated to the topic of TCM prevention and treatment of new crown pneumonia were excluded after manual screening, 137 articles were included for software processing, and a total of 128 valid literature recorded within the time slice range were obtained.

3.1. Changes in the Number of Publications

The number of published historical documents reflects the research enthusiasm and research trend of traditional Chinese medicine in the prevention and treatment of new crown. Comparing the number of published papers (see **Figure 1** for details), the research results on the prevention and treatment of the new crown by traditional Chinese medicine showed an explosive trend in the early stage, with the number of papers reaching a peak in 2020, and then the results decreased rapidly, with a total of 406 research papers in 2021 and 2022, less than two-thirds of the number of papers published in 2020. This shows that in the early stage of the new crown outbreak, the prevention and treatment of new crown by traditional Chinese medicine has quickly become a research hotspot, and related literature has sprung up. The decrease in the number of published papers may be related to the change in research direction, and in the period after TCM prevention and treatment of the new crown has become a research hotspot, researchers have become more “rational”, and the published papers on the prevention and treatment of the new crown with Chinese medicine are more professional.

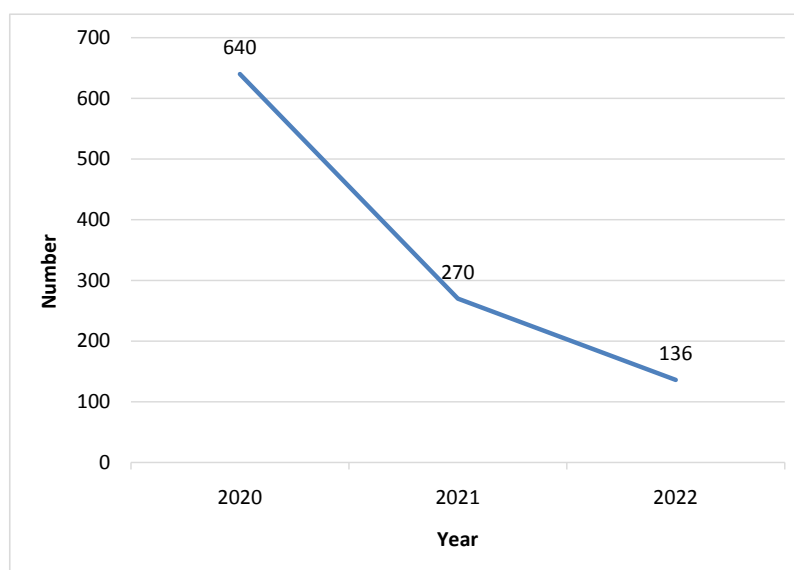


Figure 1. Chart of changes in the number of posts published.

3.2. Authors

The authors were counted by software, and the author frequency table (Table 1) was obtained, and the network diagram of author cooperation was drawn (Figure 2). The author's frequency table shows that Zhang Zhiming, Yang Fengwen, Liu Yongqi and other 3 people have the highest frequency of appearance, and they are most concerned about the prevention and treatment of new crowns with traditional Chinese medicine. In fact, the achievements of these three authors mainly focus on the theory of traditional Chinese medicine, traditional Chinese medicine technology, the basic theory and clinical effect of traditional Chinese medicine applied to the prevention and treatment of the new crown.

Table 1. Frequency table of primary authors.

Frequency	Year	Author
20	2020	Zhiming Z.
19	2020	Fengwen Y.
18	2020	Yongqi L.
14	2020	Jianyuan T.
13	2020	Qingquan L.
13	2020	Liyin Z.
12	2020	Boli Z.
11	2020	Chunguang X.
11	2020	Lei Z.
10	2020	Junhua Z.

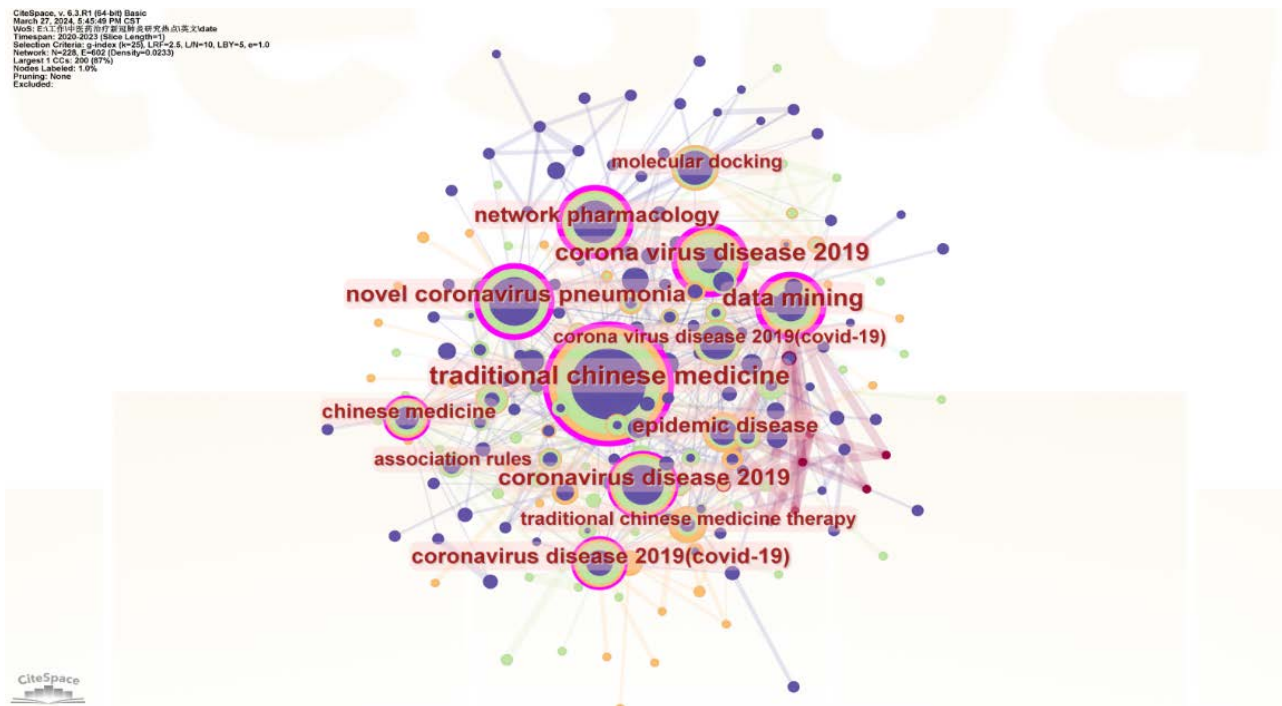


Figure 2. Keyword co-occurrence diagram.

In the author's cooperation network diagram, a total of 219 nodes and 641 connecting lines have been formed. The font size of an author's name is directly proportional to the number of papers, and the larger the font size, the richer the author's work. The thickness of the connection line between the nodes reflects the number of collaborative papers by related authors, and the thicker the connection line, the higher the frequency of the researcher appearing in the same literature. The atlas colors represent different years, with purple, orange, and yellow representing 2020, 2021, and 2022, respectively.

3.3. Research Institutes

The main research units of the research institutions are concentrated in Tianjin University of Traditional Chinese Medicine, Beijing University of Traditional Chinese Medicine and Hubei University of Traditional Chinese Medicine. After the outbreak of the epidemic, Academician Zhang Boli of Tianjin University of Traditional Chinese Medicine and Dean Liu Qingquan of Beijing University of Traditional Chinese Medicine led the national TCM medical team respectively, and were the first batch of TCM experts to arrive in Wuhan to participate in the fight against the new crown pneumonia epidemic. The medical force of Hubei University of Traditional Chinese Medicine is the main force in Wuhan's local fight against the new crown pneumonia epidemic, and the three universities and their medical teams have been fighting on the front line for a long time, accumulating a lot of valuable experience in the prevention and treatment of new crown pneumonia with traditional Chinese medicine. As a result, the frequency of the three universities is significantly higher than that of other research units, which indicates that many of the literature and journals on the prevention and treatment of new crown pneumonia by traditional Chinese medicine are concentrated in a few research institutions, and most of them come from scientific research institutions and universities, which reflects the current main position of traditional Chinese medicine in the prevention and treatment of new crown pneumonia, and these units have made more outstanding contributions to the scientific research on the prevention and treatment of new crown.

3.4. Keyword Co-Occurrence

In the keyword co-occurrence diagram (**Figure 2**), the keyword nodes are represented by circles, and the diameter of the circles is proportional to the frequency of the keywords. Among the high-frequency words displayed in the co-occurrence diagram, in addition to the largest node of traditional Chinese medicine, the nodes of epidemic disease, syndrome differentiation and treatment, and new crown pneumonia are the most significant, and these four keywords together represent the important foundation of traditional Chinese medicine for the prevention and treatment of new crown. The number of nodes ($N = 241$) reflects the number of keywords, and the number of edges ($E = 822$) reflects the number of connections between keywords. The more times the number of

co-citations, the higher the degree of overlap and the greater the strength of the association. In the keyword co-occurrence graph, the density $Density = 0.0284$ indicates that the keyword collinear network structure is compact and the density is high, indicating that the correlation between the research subjects is significant.

According to the keyword co-occurrence table (Not shown), the keyword focus and coverage gradually narrowed. The focus of research has gradually shifted from the qualitative nature of the novel coronavirus pneumonia to clinical research on children, severe cases, three drugs and three prescriptions, and finally focused on the in-depth summary of clinical prevention and treatment rules such as safety, treatment rules and treatments. The trend of keyword change reflects the focus of research on the prevention and treatment of the new crown in traditional Chinese medicine, and through the study of the new crown in different dimensions, scholars have gradually deepened their understanding of the new crown epidemic.

3.5. Keyword Clustering

The keyword clustering map (Figure 3) is used to indicate different research hotspots in the field. In the keyword clustering map, 9 clusters are distinguished by different color labels, and the serial numbers range from #0 to #8. The larger the cluster number, the fewer keywords the cluster contains. Based on the analysis of the keyword clustering vocabulary (Table 2) in Figure 3, the comparison

CiteSpace, v. 6.1.R6 (64-bit) Basic
February 10, 2023 at 4:31:11 PM GMT+08:00
WoS: E:\工作\中医药治疗新冠肺炎研究热点\data
Timespan: 2020-2022 (Slice Length=1)
Selection Criteria: g-index (k=25), LRF=3.0, L/N=10, LB=5, $\alpha=1.0$
Network: N=241, E=822 (Density=0.0284)
Largest CC: 224 (92%)
Nodes Labeled: 1.0%
Pruning: None
Modularity Q=0.446
Weighted Mean Silhouette S=0.7136
Harmonic Mean(Q, S)=0.5489

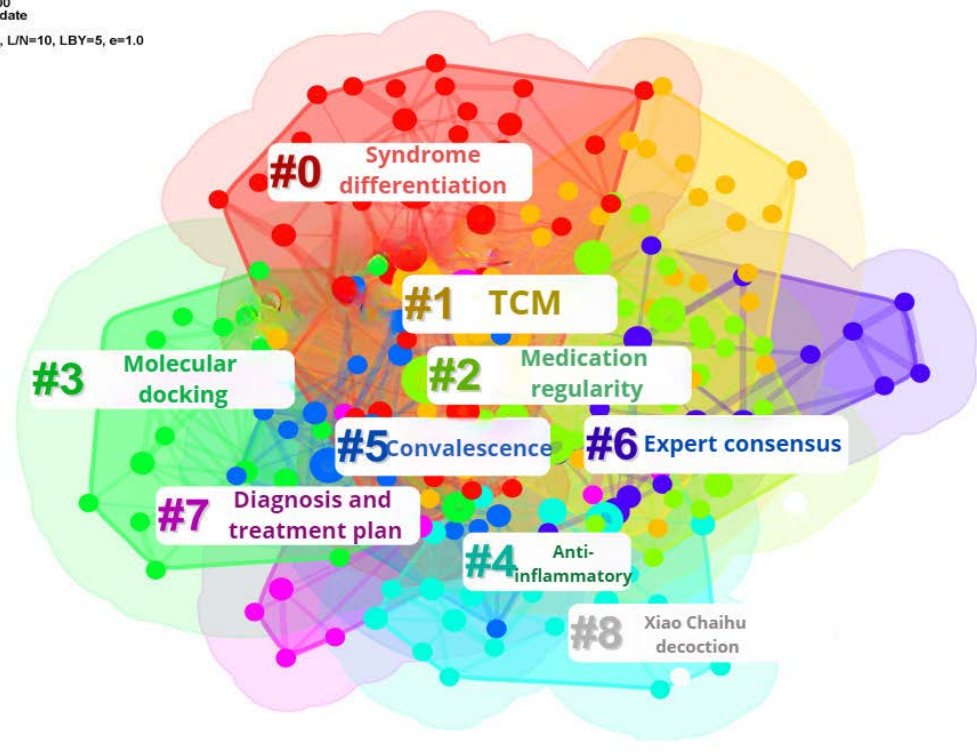


Figure 3. Keyword clustering map.

Table 2. Keyword clustering vocabulary.

Year	The name of the cluster	Centrality	Number	Name
2020	#0Syndrome differentiation	0.722	43	Syndrome differentiation; Lung Cleaner; Trifocal needle method; Etiology and pathogenesis; Clinical features
	#1TCM	0.545	40	Syndrome differentiation; Lung disease; Classic Recipes; Truncated torsion; reconciling superficies and interior
	#2Medication regularity	0.695	34	Correlation rules; Factor analysis; flavor and meridian tropism; Medication regularity; Data mining
	#3Molecular docking	0.714	26	Ginsenoside-Rh2; Maxingshigan Decoction; network pharmacology; luteolin
	#4Anti-inflammatory	0.717	23	Pulmonary fibrosis; COVID-19 No. 1; Immunomodulation; Mechanism of action
	#5Convalescence	0.778	22	Immune function; Discharged patients; TCM Theory; TCM treatment
	#6Expert consensus	0.812	18	Expert consensus; Omicron variant; Rational drug use; Adverse effects; Early intervention
	#7Diagnosis and treatment plan	0.929	10	Diagnosis and treatment plan; Comparative analysis; TCM compounds; Modern pharmacological research; Material basis
2021	#8Xiao Chaihu decoction	0.916	8	Xiao Chaihu decoction; TCM therapy; heat invading blood chamber; Exercise prescription; Sheganmahuangtang
	#0Child	0.822	15	treatment by stages; Syndrome differentiation; three TCM drugs and three herbal formulas; Biological pathways; flavor and meridian tropism
	#1COVID-19	0.789	15	COVID-19; network pharmacology; Mechanism of action; immunodeficiency
	#2Preventive treatment	0.793	14	Treatment in accordance with time-region-individual; Concept of Lasting Movement; Syndrome differentiation; Trifocal needle method; Dual and tertiary prevention and control
	#3Medication regularity	0.86	13	Medication regularity; data mining; TCM therapy; Diagnosis And Treatment Regularity; adjust measures to local conditions
	#4Heavy	0.927	10	clinical characteristics; integrated traditional Chinese and Western medicine; TCM syndrome; TCM treatment; Cytokine storm
	#5Moxibustion	0.874	8	COVID-19; Chinese medicine sachets; Pi-Fei qi-deficiency syndrome; external therapy of TCM
	#6Empirical examples	0.899	7	Compatibility law; Prevention and control programmes; Correlation analysis; Frequency statistics; COVID-19
2022	#7Characteristics of medication	0.925	5	Characteristics of medication; TCM syndrome differentiation; Principles of treatment; Psychological protection
	#0Convalescence	0.923	14	Efficacy observations; Pi-Fei qi-deficiency syndrome; Qi-Yin deficiency syndrome; omicron; Syndrome differentiation
	#1Epidemic disease	0.795	12	Traditional medicine; three TCM drugs and three herbal formulas; strengthening healthy qi to eliminate pathogens; Control strategy; Phlegm-dampness constitution
	#2Medication regularity	0.858	10	Medication regularity; Pulmonary fibrosis; therapeutic principle and method; data mining; network pharmacology
	#3Treatment in accordance with time-region-individual	0.857	9	Treatment in accordance with time-region-individual; TCM therapy; paraphronia; COVID-19
	#4Security	0.898	9	Expert consensus; recommendation; TCM efficacy; Delta Poison Strains; dampness-heat accumulating in the lung pattern
	#5COVID-19	0.79	6	COVID-19; TCM treats epidemics; TCM inheritance support system; syndrome-differentiation of the six meridians
	#6Clinical trial	1	5	clinical trial; Classic Recipes; Nucleic acid turns negative; Xiao Chaihu decoction; TCM Exercises

between the two shows the following aspects: First, the clustering labels in **Figure 3** are mainly highlighted in 2020, among which the five clustering labels such as “#0, #1, #2, #3, and #5” are more cross-clustered, indicating that the co-citation degree between these research directions is high. Second, the clustering words in **Table 2** in 2020 are highly consistent with the clustering labels in **Figure 3** and have a high information density, and compared with 2021 and 2022, the information in the three-year clustering words is significant. Thirdly, among them, the clustering of “#0, #1, #5, and #8” (**Table 2**, 2020) shows that the terms etiology and pathogenesis, sexual taste and attribution, and Xiao Chai Hu Tang reflect the fundamental basic theoretical principles of traditional Chinese medicine, such as syndrome differentiation and treatment, among which Xiao Chai Hu Tang is used in the research of prevention and treatment of new crown may be more related to the impact on the immune function of patients during the recovery period. Fourthly, the clustering of “#3 and #4” (**Table 2**, 2020) shows that the words “medication rules” and “data mining” reflect the use of modern technology to mine the laws of traditional Chinese medicine use, among which the three groups of words network pharmacology, Ma Xing Shi Gantang and immunomodulation respectively reflect the common methods of studying the active substances of traditional Chinese medicine, the common classical formulas studied, and the inflammation research in the field of immunity, which may be important research hotspots for the prevention and treatment of public health diseases such as new crown pneumonia and similar epidemics in the future. Fifth, from the changes in the cluster words such as “children, heavy, moxibustion, and case testing” in **Table 2** in 2021 to the cluster words such as “medication rules, safety, and clinical trials” in 2022, it can be seen that after the initial exploration of traditional Chinese medicine prevention and treatment of new crown pneumonia in 2020, there has been a three-stage change from extensive clinical research to in-depth induction of prevention and treatment rules, and the change in the focus of research direction reflects the breakthrough progress of people’s in-depth research on the prevention and treatment of new crown pneumonia with traditional Chinese medicine.

4. Conclusions of the Study

According to the results of the visual map, starting from the results of the number of publications, research trends, teamwork, keywords, hot spot prediction, etc., the changes in the research on the prevention and treatment of the new crown by traditional Chinese medicine can be summarized

4.1. The Research Direction Is Gradually Showing a Trend of Focus

According to the research results, from 2020 to 2022, the number of papers and hot keywords in the prevention and treatment of new crown in traditional Chinese medicine showed a decreasing trend, and the number of related papers in 2022 decreased by 78.75% compared with 2020, and the number of keywords dropped from the highest 240 to single digits in 2022. There may be three rea-

sons for this: first, it may be that the research direction of the prevention and treatment of new crown pneumonia has changed, and in the later stage of the outbreak, people have changed from the initial macro-level and overall cognitive research on the prevention and treatment of new crown pneumonia to more in-depth research on the pathogenesis of new crown pneumonia and the target of action of prescription drugs. As a result, some of the changed keywords failed to appear in the literature that generated the graph, resulting in a decreasing trend of hot keywords. Secondly, in the early stage of the new crown outbreak, a large number of journals published articles, but the research direction diverged, the quality of papers was uneven, and with the passage of time, the number of articles with insufficient depth and low citations gradually decreased, which made the hot keywords show a downward trend to a certain extent. According to the results of keyword clustering and research theme analysis, the above two reasons are combined, and the researchers pay more attention to the depth of research, and the research direction is more focused on the internal mechanism of traditional Chinese medicine in the prevention and treatment of the new crown; Finally, from the three-year trend, in the early days of the outbreak of the epidemic in 2020, the number of followers increased sharply, and the number of related articles showed a synchronous growth trend; In the middle stage of the epidemic in 2021, the number of studies decreased significantly. It may be that researchers in non-medical fields who are only interested in for a moment have significantly reduced, leaving relatively professional researchers; In the middle and late period of 2022, a small number of professional teams that focus on the new crown epidemic may occupy the mainstream, which has further reduced the number of literary quantities and keywords that directly related literature and keywords to study the new crown pneumonia.

In fact, in the papers after 2020, there are relatively more keywords on the internal mechanism of traditional Chinese medicine in the prevention and treatment of the new crown. According to the results of keyword co-occurrence and clustering, many scholars have focused on the prevention and treatment of novel coronavirus pneumonia in traditional Chinese medicine, mainly focusing on syndrome differentiation and treatment, medication rules, molecular docking, recovery period, data mining, network pharmacology, and preventive treatment. To a certain extent, this trend of keyword change reflects the focus of related research, and researchers are carrying out more in-depth research to explore the internal laws of traditional Chinese medicine in the prevention and treatment of new crowns. As for the phenomenon of low continuity and discrete research results of some researchers reflected in the results of the knowledge graph, it may be due to the staged distribution of research results, or it may be that researchers lack in-depth excavation of internal law research.

4.2. The Change of Hotspots Is in Line with the Process of Disease Response

The scientific research and clinical application of traditional Chinese medicine

in the prevention and treatment of the new crown are closely related to the occurrence and development of the new crown epidemic. According to the results of literature analysis, the research hotspots of TCM in the prevention and treatment of new crown will be represented by syndrome differentiation and treatment, three factors and conditions, data mining, etc. in 2020, and three drugs and three prescriptions, compatibility rules, sequelae, etc. in 2021, and will be transformed into clinical application, treatment rules, and safety in 2022. In the early stage of the epidemic, researchers focused on summarizing the overall epidemic law of the new crown in various regions, and the analysis of the three factors and the time was the most commonly used method. In the second stage, how to deal with the disease, the law of prescription compatibility and the changes in symptoms after the disease has become the focus of people's attention. When the epidemic gradually entered the normalization stage, through the accumulation of preliminary research, the research direction changed to in-depth and professional research on human physiological and pathological changes, mechanism of action, signaling pathways, drug activity, drug safety, etc. under the guidance of treatment rules and methods.

This change in research hotspots is consistent with the change in the stage of prevention and treatment of the new crown and also reflects the change of research entry points of researchers in different periods of response to the new crown. With the deepening of the understanding of the transmission law and prevention and control path of the new coronavirus, the clinical diagnosis and treatment strategy of the new crown infection has been improved, and the speed and effective rate of curing the infected patients have also been significantly improved. In the latter part of 2022, research on individual psychological problems caused by COVID-19 infection and even its impact on society has gradually deepened [11] [12]. Researchers not only look at the prevention and treatment of the new crown in isolation, but also evaluate the impact of the new crown on society from the perspectives of public health, social medicine, and health sociology, as well as the medical and sociological value of traditional Chinese medicine.

4.3. Carry Out In-Depth Scientific Research at the Basic Level

According to the keyword research, the in-depth research on the prevention and treatment of the new crown in traditional Chinese medicine is mainly carried out from two paths: the research approach in the field of traditional Chinese medicine theory itself, and the way of using modern technology to conduct experimental research based on the principles of traditional diagnosis and treatment.

According to the literature analysis, the theory of traditional Chinese medicine characteristics was used to guide and apply the corresponding diagnosis and treatment plan to achieve good results, and the corresponding theoretical research and clinical experience were summarized comprehensively. The prevention and treatment of COVID-19 based on the theory of traditional Chinese

medicine, including the theory of five luck and six qi, can effectively curb the further development of the disease and promote the recovery of patients through early syndrome differentiation and timely intervention [8]. In fact, according to the diagnosis and treatment principles of TCM syndrome differentiation and treatment, individualized and accurate diagnosis and treatment can be carried out according to the actual situation of patients to ensure the clinical treatment and prevention effect. According to the theory and practical experience of traditional Chinese medicine on “epidemic diseases”, factors such as climate, physique, diet, work and rest may affect the occurrence and development of diseases during the process of infection. During the recovery period, according to the plague pattern of COVID-19, the characteristics of post-illness disease are analyzed by distinguishing the syndrome, and prescribing drugs for different factors affecting lung function are very important for daily recuperation [13].

In the process of using traditional Chinese medicine to prevent and treat the new crown, researchers have conducted in-depth exploration of the new crown medication and its internal mechanism based on data mining and molecular docking technology, which is helpful for clinical precision medicine. Some scholars have conducted research based on data mining methods [14], while others have explored clinically effective prescriptions at the molecular level through network pharmacology methods, and conducted in-depth research on the signaling pathways of effective active molecules acting on COVID-19.

4.4. Teamwork Can Help Improve Research Efficiency

Focusing on the core researchers, a core author group has been initially formed, and a relatively mature scientific research cooperation relationship has been established. According to the cooperation network map of the authors, some authors have close contact with each other and more cooperation and exchanges, and are distributed in block-like areas, such as Zhang Boli (Academician of the Chinese Academy of Engineering; the honorary title of “People’s Heroes”), Liu Qingquan (Dean of Wuhan Jiangxia Fang Cabin Hospital) and Yang Fengwen (Participate in frontline research and coordination work throughout the process), who are densely connected and closely related in time span. Analyzing the specific results of several authors, they jointly studied the role of integrated traditional Chinese and Western medicine in the prevention and control of the novel coronavirus pneumonia epidemic, put forward thoughts on the prevention and treatment of novel coronavirus pneumonia with traditional Chinese medicine, and published a large number of research results such as the analysis of diagnosis and treatment plans and clinical treatment observations.

According to the results of the map of the authors of the paper and the research institutions, the core research team of the research on the prevention and treatment of the new crown in traditional Chinese medicine has been preliminarily formed in the schools and relevant medical institutions, and the authors of the papers are consistent with the prominence of the institutions and medical teams where they are located. Although some evidence from other sources sug-

gests that there may still be scattered and inadequate communication between research teams, teamwork clearly improves research efficiency, especially in theoretical research, clinical research, and feedback exchange, and has become the core of the institution. Tianjin University of Traditional Chinese Medicine, Beijing University of Traditional Chinese Medicine, Hubei University of Traditional Chinese Medicine and other institutions listed in this study all have famous scholars or high-level teams to drive the development of disciplines, and their frequency is significantly higher than that of other institutions. The signatories show that the cooperation between universities, scientific research institutions and medical institutions is more common, indicating that institutions dominated by universities are still the main front for the prevention and treatment of the new crown in traditional Chinese medicine. Relevant data show that the ability to achieve outstanding results in the field of traditional Chinese medicine prevention and treatment of the new crown mainly depends on the long-term research accumulation of these institutions in the fields of traditional Chinese medicine and traditional Chinese medicine.

5. Summary and Outlook

Traditional Chinese medicine is the treasure of the Chinese nation, and this sentence is not only reflected in the inheritance of traditional culture, but also in the actual effect of traditional Chinese medicine in disease prevention and treatment. When we talk about giving full play to the five resource advantages of traditional Chinese medicine, or talking about the huge development potential of traditional Chinese medicine, we must build on the basis of the actual effects of traditional Chinese medicine, stand on the basis of scientific research related to traditional Chinese medicine, and speak with actual data and scientific research results. According to the results of national statistics, traditional Chinese medicine has performed well in the prevention and treatment of new crown, the early treatment of new crown patients, and the rehabilitation and cure of severe patients, which can be said to have practical clinical effects and great potential for experimental research.

In response to the new crown, traditional Chinese medicine has made new contributions and played an important role in public health events, but why traditional Chinese medicine is effective and how to play a better role in traditional Chinese medicine still needs to be deeply considered by researchers, so it is necessary to further explore the internal laws of the success of traditional Chinese medicine. According to the analysis of the research hotspots of TCM in the prevention and treatment of COVID-19 in the 2020-2022 period, and the relevant rules are summarized, it is hoped to analyze the important directions of TCM research from the perspective of literature analysis and provide a reference for the scientific development of TCM research. According to the results of literature analysis, the three key research directions of traditional Chinese medicine in the prevention and treatment of new crown are summarized as follows.

First, the internal mechanism of TCM in the prevention and treatment of new coronavirus infection and the diagnosis and treatment of the disease is excavated, and the mechanism of TCM prevention and treatment of COVID-19 is explained with the unique theory of TCM, and its effect is evaluated. Second, the experience of using traditional Chinese medicine to prevent and treat new crown and similar epidemics should be deeply explored, and the advantages and effects of traditional Chinese medicine in public health and public health emergencies should be sorted out, so as to form a theoretical and practical plan for traditional Chinese medicine to participate in epidemic prevention and epidemic prevention and control with Chinese characteristics. Thirdly, based on the theory of traditional Chinese medicine in the prevention of diseases, the advantages of traditional Chinese medicine in the early intervention of physical health and the improvement of physical fitness are explored, and the advantages of traditional Chinese medicine are fully played in the stage of prevention of diseases. In addition, the research on the prevention and treatment of the new crown by traditional Chinese medicine can be carried out from the perspective of paying equal attention to traditional Chinese and Western medicine and the integration of traditional Chinese and Western medicine, and the historical record of traditional Chinese medicine in the prevention and treatment of epidemic diseases and the practical experience of the new crown epidemic stage are likely to be an important source of relevant scientific research materials.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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