



Reflections on the Application of Chinese Medicine During the Epidemic of COVID-19

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Abstract

Traditional Chinese medicine (TCM) has played an important role in the prevention and control of coronavirus disease 2019 (COVID-19) and has received considerable attention from all sectors of society. In the current situation of the global outbreak, it is crucial to promote the global application of TCM. However, the pandemic has also exposed various problems affecting the widespread acceptance of TCM. In this review, we summarize efforts to prevent and control COVID-19 by TCM and provide strategic guidance on how to promote its practice in the context of public health emergencies by (1) completing the system for evaluating the clinical efficacy of TCM; (2) transforming decoctions into Chinese patent medicines; (3) encouraging low-threshold traditional rehabilitation therapy; (4) strengthening communication and cooperation with the media. The aim of these approaches is to improve the rigor of TCM research and its dissemination, sharing the antiepidemic experience of TCM to the world, as well as increase the engagement of and acceptance by the masses. In this manner, TCM will not only aid in preventing and controlling COVID-19 but can also provide tools for coping with future public health emergencies.

Keywords

- ▶ COVID-19
- ▶ TCM
- ▶ clinical trial
- ▶ public health emergency

Introduction

In 2019, coronavirus disease 2019 (COVID-19) broke out,^{1,2} with a 2% case fatality rate,³ causing serious damage to the health and economy of the people in the world.^{4–6} Then, the World Health Organization declared COVID-19 as a Public

Health Emergency of International Concern.⁷ In the absence of a specific drug to treat cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection,^{8,9} practitioners of traditional Chinese medicine (TCM) have relied on experiences and prescriptions for preventing and treating disease outbreaks garnered from the rich history of TCM.^{10,11}

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On the basis of supportive treatment and the combination of TCM and Western medicine, a recent study showed that the clinical cure rate of this combined approach was 33% higher than that of a Western medicine group, and the rate of conversion from general to severe disease decreased 27.43%, which highlights the advantages of integrating TCM and Western medicine.¹²

TCM and Western medicine differ in terms of the theoretical basis and treatment norms, such as holistic approach and syndrome differentiation and treatment in TCM.^{13,14} The TCM approach of individualized treatment in which an individual receives specific prescriptions that can be added or subtracted according to symptomology is incompatible with the universal treatment scheme of Western medicine, thus posing a barrier to the widespread application of TCM and its acceptance by the general public. Increasing the dissemination of TCM can potentially contribute to the prevention and control of COVID-19. In this review, we discuss the work of TCM in this regard and summarize measures to promote the spread of TCM, which cannot only aid in the management of this epidemic but can also serve as a reference for future public health emergencies.

Evaluation of Clinical Efficacy to Improve the Rigor of Traditional Chinese Medicine Research

An important barrier to the acceptance of TCM by medical professionals and the masses is the lack of standardized evidence of its clinical efficacy.^{15,16} Reports on this topic have mostly been limited to case reports and experience sharing. Systematically evaluating the therapeutic value of TCM based on empirical evidence is critical for expanding the influence of TCM.¹⁷

Overall Status of Registered Trials on Traditional Chinese Medicine for Coronavirus Disease 2019

Since the outbreak of the COVID-19 epidemic, the number of clinical registrations has soared, accompanied by a variety of problems in clinical trial registration. We counted the first 100 TCM related studies registered since the outbreak. Among them, there are 80 intervention studies on efficacy evaluation, 72 for treatment, 2 for prevention, and 6 for rehabilitation. Among them, 58 were randomized parallel control studies, and 68 were approved by the clinical ethics committee. The clinical trials and specific interventions that were evaluated are listed in ►Table 1.

Problems Exposed by Registered Traditional Chinese Medicine Trial Information

Several issues have undermined the rigor of registered TCM trials. First, the basic concepts of placebo and randomization are unclear in some studies.¹⁸ One trial even used boiled water as a placebo. Some of the conducted trials were not registered or did not strictly adhere to ethical standards. For example, in one study, the control group did not receive any treatment. Second, there are significant variations in the primary and secondary outcome measures. For example, some studies used C-reactive protein as an inflammation-related indicator, whereas others used procalcitonin, cytokines, and other markers (►Fig. 1), making it difficult to compare the results of different trials. Third, with the exception of Chinese patent medicines and Qingfei Paidu decoction, the details of most TCM interventions are unclear, and specific syndrome differentiation, prescriptions, and dosage are not reported, which hinders the sharing of clinical data.¹⁹ Fourth, outcome evaluation of most clinical studies includes only biological indicators, while TCM-associated syndromes have been omitted,²⁰ with the result that certain TCM resources have been squandered. Last, most studies have

Table 1 Registered clinical study of novel coronavirus pneumonia treated by TCM

Study type	Experimental design	Total number	Ethical approval	Intervention measures of TCM
Treatment	RCT	54	60/72	Chinese patent medicines: Jinyin Granule, Xuebijing injection, Liushen Pill, Jinye Baidu Granule, Babao Dan, Shenqi Fuzheng injection, compound Houத்துynia mixture, Tanreqing Capsule, honeysuckle oral liquid, Keshuting Syrup, Xiaoer Huatan Zhike Granule, antiviral oral liquid, Shenfu injection, Xiyanning injection, Shufeng Jiedu Capsule, Mxing Shigan Decoction combined with Shengjiang Powder, Qingwen Baidu Drink Formula Granules, Shenling Baizhu Powder, Zedoary Turmeric Oil Injection TCM decoction: Qingfei Paidu Decoction, Kangguan 1, Kangguan 2, Kangguan 3, Yiqi Huashi Jiedu Decoction, Qingfei Decoction, Baidu Dan, Jinyinhua Decoction, Maxingshigan decoction combined with Shengjiang powder, Qingwenbaidu Decoction formula Granule, Shenling Baizhu powder Others: Meditation, Baduanjin, Kangfujianfei Baduancao, psychological intervention, acupoint Qigong, moxibustion, massage, health guidance, Guixi Tiaoxin
	Non-RCT	9		
	Continuous entry trial	3		
	Single arm trial	6		
Rehabilitation	RCT	6	6/6	Taijiquan, Health Qigong and lung nourishing formula, psychological intervention, TCM nursing
Prevention	RCT	2	2/2	Decoction of Chinese medicinals (without detailed scheme)

Abbreviation: TCM, traditional Chinese medicine; RCT: randomized controlled trial.

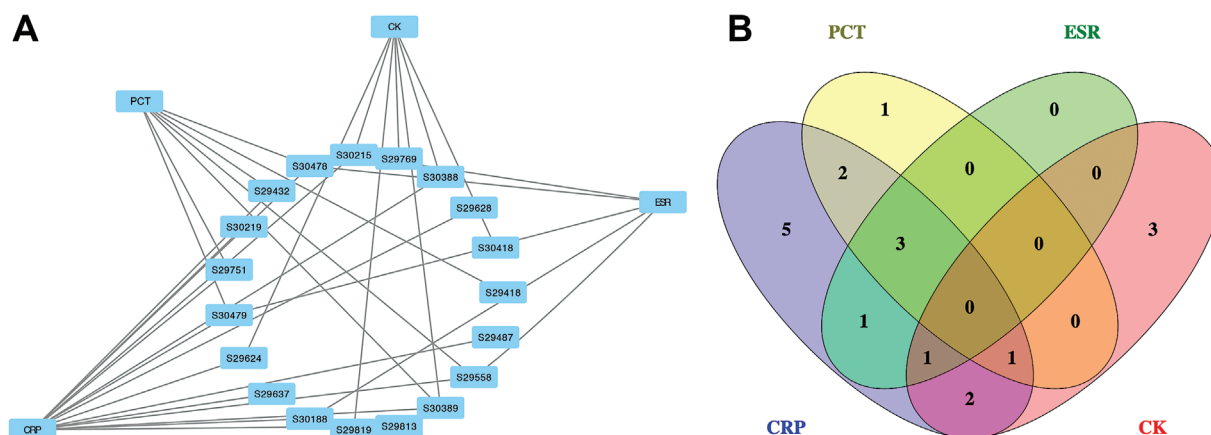


Fig. 1 Interaction of inflammation-related indicators between registered TCM studies of new coronary pneumonia. (A) Collaborative relationship of four indicators among studies. (B) Quantitative relationship of four inflammation indicators. Abbreviations: CK: cytokines; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; PCT, procalcitonin.

not monitored adverse reactions and toxic effects of TCM treatment. Thus, the safety of TCM remains undetermined.

Suggestions on Improving the State of Traditional Chinese Medicine Clinical Research

The emergence of the new coronavirus epidemic has posed a major public health challenge. For the clinical value of TCM to be widely accepted, trials must be designed so that they adhere to the principles of evidence-based medicine and are guided by professional methodological teams to avoid wasting resources. Low-quality research not only exacerbates the problem of resource shortage but also undermines the quality of TCM clinical research. We propose that government administrative departments organize clinical trial evaluations, tighten the checks of clinical trial registration and ethics committees, and focus research efforts. Research groups should increase cooperation and the sharing of clinical data and follow standardized trial protocols to facilitate data integration and follow-up.¹⁸ At the same time, TCM-associated syndromes and the advantages and outcome measures of TCM must be more clearly defined to modernize this practice and enhance its value.¹⁹

Transforming Decoctions into Chinese Patent Medicines

Chinese patent medicines have played an important role in the management of COVID-19 according to the *Diagnosis and Treatment Plan for Pneumonia Infected by New Coronavirus*.^{21–26} Chinese patent medicines were crazily purchased in previous epidemics include “Banlangen Event” for SARS and “Shuanghuanglian Oral Solution Event” for New Coronar Pneumonia.²⁷ The willingness of the masses to purchase these Chinese patent medicines during public health crises demonstrates that they can be readily disseminated.

Chinese Patent Medicines Can Increase the Age Range of Traditional Chinese Medicine Users

We used the Baidu Index to evaluate the level of interest of Baidu users in Chinese patent medicines and traditional

decoctions recommended for the prevention and treatment of COVID-19 during the epidemic by using the Target group index (TGI). We searched four classic decoctions (Qingfei Paidu Decoction, Guizhi Decoction, Mahuang Decoction, and Moxing Shigan Decoction) and five Chinese patent medicines (Xiyanning + Xiyanning injection, Lianhua Qinghuo Capsule + Lianhua Qingwen granule, Qingkailing oral liquid + Qingkailing Capsule + Qingkailing granule, Shuanghuanglian oral liquid + Shuanghuanglian granule and Huoxiang Zhengqi Pill + Huoxiang Zhengqi water + Huoxiang Zhengqi oral liquid). The term “Chinese patent medicine” was directly searched to determine the degree of active interest in TCM. The audience of four epidemic-related traditional decoctions was mainly persons >40 years of age (TGI > 100), with relatively little attention paid by adults between the ages of 20 and 40 years (TGI < 100; ▶Fig. 2). The age range of Baidu users who searched for information on the five epidemic-related Chinese patent medicines was broader (>20 years), whereas searches of the term “Chinese patent medicines” were more common in persons under the age of 30 years. We suggest that interest in Chinese patent medicines can compensate for the lack of attention to traditional decoctions in persons <40 years old and can encourage acceptance of TCM across all age groups.

Conversion of Decoctions into Chinese Patent Medicines and Strengthening the Rationale for Using Chinese Patent Medicines

Classic formulations are processed and concentrated for transformation into Chinese patent medicines, which not only retain the active ingredients of the original decoction but also eliminate the preparation time and facilitate their transport and intake,²⁸ thus making them more appealing to the public. Compared with oral forms, injectable Chinese medicinals have a more rapid onset of therapeutic effects and are amenable to mass production,²⁹ and their administration is more convenient. Thus, promoting the transformation of effective formulations and dosage forms and expanding the coverage of Chinese patent medicines can increase the widespread adoption of TCM practices. However, misuse of

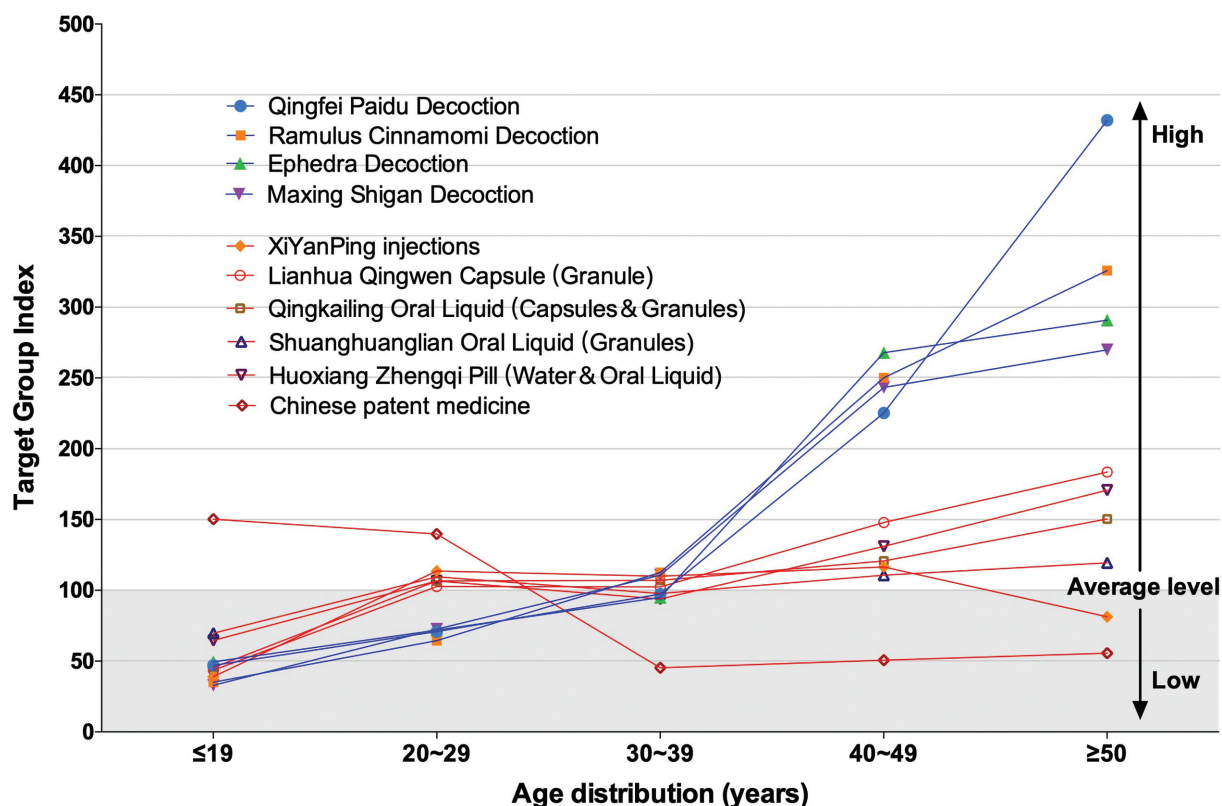


Fig. 2 The popularity of Chinese patent medicine and traditional decoction for prevention and treatment of COVID-19 among people of all ages. The target group index (TGI) information comes from Baidu Index, which is collected from February 7 to March 7, 2020. Blue lines: traditional decoction; Red lines: Chinese patent medicines. When the target group index equals 100, it represents the average level. If the TGI is higher than 100, it means that the user's attention to certain drugs is higher than the overall level. Gray areas indicate that people are less concerned about the drug than average (TGI < 100).

these agents because of their ease of distribution must be avoided. For example, for COVID-19, there was a blind rush by the public to purchase Shuanghuanglian oral liquid to protect against coronavirus infection without informed guidance,²⁷ leading to cases of gastrointestinal adverse reactions. This underscores the importance of educating the masses on the safe and appropriate use of Chinese patent medicines. Pharmaceutical supervision departments should also increase their scrutiny of the directions for the use of Chinese patent medicines (especially dosing for special groups such as pregnant women and children) and more closely monitor and record adverse reactions and drug–drug interactions^{30,31}; this can strengthen the rationale for prescribing these medicines and enhance their safety, while providing a reference to the masses for making informed choices regarding treatment options.

Engaging the Masses with Low-Threshold Traditional Rehabilitation Therapy

The Guiding Recommendations for TCM Rehabilitation in the Recovery Period of New Coronavirus Pneumonia (Trial) formulated by the State Administration of TCM describe six suitable types of TCM for controlling COVID-19, namely, moxibustion therapy, acupoint massage, ear point pressing beans, scraping, cupping, and acupuncture therapy, along with two traditional exercises, namely, Baduanjin and Taiji-

quan (– **Table 2**).³² Traditional rehabilitation therapy, which is based on TCM theory, is a means of improving patients' physical and mental health and quality of life not only by relieving their physical pain and mental distress but also by increasing their confidence in overcoming the disease.

Promoting the Spread of Traditional Chinese Medicine Through Traditional Rehabilitation Therapy

Appropriate techniques of TCM and traditional exercises have played an important role in promoting TCM. The merits of the former which includes acupuncture are recognized worldwide^{33–35}; and the latter are readily accepted by the masses because of their low threshold, time commitment, and energy consumption, and alignment with national healthcare consciousness.³⁶ COVID-19 is a test for the TCM system and a good opportunity for its promulgation. Baduanjin, a TCM health exercise, was shown to exert a synergistic effect on the recovery of vital energy in patients with COVID-19 by mobilizing the whole body through coordinated movements to enhance physical strength, blood oxygenation, and immune function. In Jiangxia Dahuashan Square Cabin Hospital, traditional Kung Fu Baduanjin and breathing and turning exercises were widely adopted by patients and healthcare workers.³⁷ Traditional rehabilitation therapy is simple, effective, convenient, and inexpensive and can improve malaise symptoms such as fatigue and shortness of breath in patients with COVID-19.³⁸

Table 2 Traditional rehabilitation therapy and guidance recommendations in “guideline recommendations for TCM rehabilitation in COVID-19 (Trial)”

Categories	Therapy sorts	Details
Appropriate Technology of TCM	Moxibustion	Dazhui(DU14), Feishu(BL13), Shangwan(RN13), Zhongwan(RN12), Geshu(BL17), Zusanli (ST36)
	Meridian massage	Acupoint massage: Taiyuan(LU 9), Zhongfu (LU 1), Danzhong(RN 17), Shenshu(BL 23), Dachangshu (BL 25), Zhongwan(RN 12), Feishu(BL 13), Lieque(LU 7), Zusanli(ST 36) etc. Add Shaoshang (LU 11), Chize (LU 5) if coughing, dry coughing or throat itching
		Meridian massage: lung meridian of hand-Taiyin, large intestine meridian of hand-Yangming, stomach meridian of foot-Yangming, spleen meridian of foot-Taiyin, conception meridian and governor meridian etc.
	Auricular point pressing beans	Common auricular points: Bronchus point, lung point, incretion point, Shenmen point, occiput point, spleen point, stomach point, large intestine point and sympathy point etc.
	Scraping	Lung meridian of hand-Taiyin, large intestine meridian of hand-Yangming, urinary bladder meridian of foot-Taiyang. etc.
	Cupping	Feishu(BL 13), Gaohuang(BL 43), Pishu(BL 20), Shenshu (BL 23) and Dazhui(DU 14) etc.
Acupuncture	Commonly-used acupoints: Quchi(LI 11), Taiyuan(LU 9), Feishu(BL 13), Zusanli(ST 36), Yinlingquan(SP 9) and Guanyuan(CV 4) etc. Syndrome matching points: Add Geshu(BL 17), Shenshu (BL 23) and Dachangshu (BL 25) if feeling weakness, cold-fearing and having pale tongue. Add Zhongwan(RN 12) and Tianshu (ST 25) if having poor appetite, thin stools and pale tongue. Add Dazhui(DU 14), Dingchuan (EX-B1) and Gaohuang(BL 43) if coughing, expectorating and having pale tongue.	
Traditional exercises	Baduanjin	It is recommended to exercise once or twice a day for 10 to 15 minutes, and adjust the intensity of exercise according to individual physical condition.
	Taijiquan	It is recommended that once a day for 30–50 minutes each time.

Abbreviation: TCM, Traditional Chinese medicine.

Note: This guidance applies to the people in the recovery phase who meet the criteria for decoupling and discharge from the COVID-19 diagnosis and treatment program. Clinicians can refer to this guidance and give relevant treatment or rehabilitation guidance according to the individual situation of the patient. After discharge, patients can also adopt appropriate self-intervention methods according to this recommendation.

Encouraging Mass Participation in Traditional Rehabilitation Therapy

Promoting traditional rehabilitation therapy by increasing the participation of the masses requires the joint efforts of the government, community, media, primary medical units, health care workers, and other parties.³⁹ Government departments should strengthen guidance, improve relevant rules and regulations, and ensure the orderly and coordinated development of traditional rehabilitation therapy at all levels of operation from medical units to communities.⁴⁰ The community can adopt certain measures to advertise traditional rehabilitation therapy such as Baduanjin that has a low threshold and can thus be readily propagated among communities and individuals. Also, the media and journalists can actively report the advantages of traditional rehabilitation therapy such as simplicity, convenience, effectiveness, and low cost and thereby gradually increase the awareness of traditional rehabilitation therapy among the masses through various media channels such as radio, news, microblog, and the WeChat social media platform. Moreover, grassroots medical units should be equipped with doctors trained in traditional rehabilitation therapy who can carry out the relevant work, are knowledgeable, and contribute to the advancement of TCM.⁴¹ Health care workers should be mindful of and open to traditional rehabilitation therapy.

On the one hand, they should use it to relieve physical pain in patients; at the same time, they should be aware of its equal importance for mental health.

Strengthening Communication and Cooperation with Media to Improve Public Opinion of Traditional Chinese Medicine

As an intermediary between the medical profession and general public, the media play an important role in publicizing the effects of TCM treatments and can influence the perceptions, emotions, and decisions of the general public.⁴² Accurate reporting of TCM can thus aid in epidemic prevention and control, while misinformation can cause panic and exacerbate epidemics.

Influence of False Media Reports on the Public's Opinion of TCM

There have been inaccurate news reports related to TCM in the context of COVID-19, two of which are highlighted here. The first report that Shuanghuanglian can inhibit the new coronavirus was published in the People's Daily (Sina Weibo topic with 2.22 billion views).²⁷ The reporter did not mention the limitations of the study, such as the effect was observed only in vitro, resulting in a blind rush by the public to

purchase and use Shuanghuanglian in a misguided attempt to prevent SARS-CoV-2 infection. Moreover, this led to a mass public gathering during the COVID-19 outbreak, despite the fact that self-isolation is a better strategy to decrease the risk of infection. The second report that the tension of patients with COVID-19 was alleviated after taking TCM was published by the China News Network (Sina Weibo topic with 350 million views).⁴³ Huang Luqi, a researcher at the Chinese Academy of Engineering and president of the Chinese Academy of Chinese Medical Sciences, originally stated that “the people are in urgent need of TCM, and they are at ease under the protection of TCM.” Unfortunately, an incorrect interpretation of this statement by the media resulted in the public believing that TCM is no better than a placebo.

Suggestions on Strengthening Communication and Cooperation Between Proponents of Traditional Chinese Medicine and the Media

During an outbreak, the public is highly sensitive to relevant information and any misinformation can lead to collective irrational actions. Many people blindly listen to rumors that could require considerable effort to address and refute.⁴⁴ This is detrimental not only to the management of the epidemic but also to public confidence in the medical community.

Acceptance by and engagement of the masses is essential for expanding the influence of TCM.⁴⁵ Experts in TCM should strengthen communication and cooperation with the media, validate information on TCM from the medical and public opinion perspectives, use easy-to-understand language in communications about TCM, and be mindful of the subject characteristics of TCM. At the same time, the government must improve systems for monitoring and transmitting accurate information and countering false information and provide guidance to the public for identifying the relevant aspects of TCM.⁴⁶ Finally, the use of professional and precise language and responsible actions by the media can help expand the reach of TCM.

Outlook

Since the outbreak of COVID-19, TCM has played an important role in the prevention and control of the outbreak. However, due to the particularity of the theoretical system of TCM and the insufficient understanding of the theoretical knowledge of TCM by the masses, the dissemination quality and efficiency of TCM are hindered to a certain extent, and the acceptance and recognition among the masses are reduced. It is urgent to improve the rigor of TCM research and promote the dissemination effect, which cannot only make TCM fully exert its efficacy and value in this global anti-epidemic work, but also promote the inheritance and innovation of TCM. We should gradually improve the evaluation system of clinical efficacy of TCM, promote the conversion of TCM Decoction to Chinese patent medicine, and promote low-threshold traditional rehabilitation therapy, at the same time, strengthen communication and cooperation between

the media, so as to expand the dissemination degree and influence of TCM. By further promoting and sharing with the world's medical workers the experience and programs of TCM in fighting the epidemic, we can really push the inheritance, innovation, and development of TCM to a new stage so that TCM not only plays an important role in the prevention and control of the new coronary pneumonia epidemic but also contributes to human health.

CRedit Authorship Contribution Statement

Shaohui Geng: Conceptualization, visualization, writing –original draft. **Hanlin Shi,** Shuangqing Yang, and Yaoyang Li: Visualization, data curation. **Haixu Jiang, Heng Xu, Hesong Wang, and Zhiming Li:** Investigation, data curation. **Liping Yang:** Supervision, writing-review & editing.

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Conflict of Interest

The authors declare no conflict of interest.

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