Patient Preference and Adherence

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ORIGINAL RESEARCH

The Influencing Role of Cultural Values on Attitudes of the Chinese Public Towards Traditional Chinese Medicine (TCM) for the Control of COVID-19

Huajian Zhao[1], Ruifen Zhang[2], Yi Chen[1]

[1]School of Communication, Soochow University, Suzhou, Jiangsu Province, 215127, People's Republic of China; [2]School of Public Health, Soochow University, Suzhou, Jiangsu Province, 215127, People's Republic of China

Correspondence: Yi Chen, School of Communication, Soochow University, Suzhou, Jiangsu Province, 215127, People's Republic of China, Email chenyisuda@suda.edu.cn

Video Abstract

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Purpose: The use of traditional Chinese medicine (TCM) for disease prevention and healthcare has been strongly supported by the Chinese government in recent years, but public perception of TCM remains controversial or resistant, especially in preventing and treating COVID-19. It is therefore crucial to understand the factors that influence public attitudes.

Methods: By applying a measure of attitudes towards TCM in epidemic prevention, this study conducted a nationwide survey (n=1192) on the relationships between attitudes towards TCM for the control of COVID-19 and trust, perceptions of risk, scientific literacy, policy endorsement, and cultural values.

Results: The results of the study showed surprisingly that scientific literacy and risk perception did not dominate the Chinese public's attitudes towards TCM for the control of COVID-19. Meanwhile, egalitarianism, policy endorsement, trust in scientist and healthcare personnel played a positive role. Moreover, egalitarianism positively regulates the relationship between trust in scientist and attitudes towards TCM epidemic prevention and control, while collectivism negatively regulates the relationship of the preceding variables.

Conclusion: All these findings suggest that attitudes towards the use of TCM are not based on rational cognition and logical reasoning, but are mainly influenced by emotional and cultural factors. This study will help researchers and practitioners understand the importance of cultural values, trust, policy endorsement, and attitudes towards TCM epidemic prevention and control to TCM's use in healthcare.

Keywords: TCM, cultural values, policy endorsement, COVID-19

Introduction

Traditional Chinese medicine (TCM) is a system of medical knowledge and healthcare invented by the Chinese people.[1,2] TCM can now be considered a kind of basic healthcare for people and plays a unique role.[3] Rooted in the profound cultural soil of the Chinese nation, TCM has been accepted and widely used by the masses of people from ancient times. However, Western medicine has been introduced into China along with the eastward spread of Western learning since modern times, which has gradually shaken the Chinese public's deep-rooted ideas and acceptance of TCM.[4] TCM and Western medicine come from two different systems with entirely different basic concepts, hypotheses, and ways of thinking.[5] The public's attitude towards TCM is actually a complex psychological state arising from the contrast between TCM and Western medicine. With such contrasting approaches to health and illness in TCM and WM, it can be expected that users of these different medical systems may well have different understandings of health and illness.[6] In the Chinese mainland, the proportion of Choosing TCM to treat diseases exceeded 32% in 2017.[7] Research has shown that belief in

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traditional Chinese cultural values, including Confucianism, also influences the choice between TCM and Western medicine, with those with Confucian obligations having a more positive attitude towards TCM.[6]

Chinese medicine refers to all medical practices that can be legally practiced in China, including but not limited to traditional Chinese medicine (including other ethnic medicine) and Western medicine. TCM has been recognized as a potential turning point in the history of Chinese medicine, as it has withstood great trials and played an important role in the prevention and treatment of COVID-19 in China.[8] Relevant studies have shown that TCM improved clinical symptoms, reduced mortality, and increased recovery rates in this COVID-19 control in China.[9] The history of TCM treatment of infectious diseases is well documented.[10] The theory and experience of TCM on epidemic diseases have been summarized and developed continuously in the practice of epidemic prevention and control in the past dynasties. It is worth mentioning that TCM proved effective in preventing and treating SARS coronavirus in 2003. Scientific theories of TCM guided clinical administration and systematic modern TCM screening technology, which improved the clinical efficacy of SARS prevention and treatment.[11] From the full participation of TCM in the prevention and treatment of SARS to the treatment of malaria with artemisinin, TCM is playing an increasingly prominent role in the prevention and treatment of modern infectious diseases. Public awareness of the critical role of TCM in the prevention and treatment of COVID-19 has increased, and more people are willing to learn more about TCM knowledge and use it in healthcare.

Patient attitude is one of the important areas of health service research, and the public attitudes towards TCM epidemic prevention provides us with an excellent case of empirical research on the application of TCM in healthcare. The debate over traditional Chinese medicine (TCM) has once again come to the forefront during the outbreak in China, focusing on the effectiveness of TCM in the prevention and treatment of COVID-19. Chinese herbal medicine (CHM) may be recommended as an adjuvant immunotherapy for disease modification and symptom relief in COVID-19 treatment, but further evaluation is needed.[12] Relevant studies on the Chinese public's attitude toward TCM prevention and treatment of COVID-19 in recent years show that the Chinese public has a positive attitude toward using TCM for epidemic prevention, even though its effectiveness remains controversial.[13–18] A study on the debate among Chinese netizens about the effectiveness of TCM found that the current debate among Chinese Internet users about the effectiveness of TCM in treating COVID-19 did not change their overall positive attitude towards TCM, which was influenced by nationalist sentiments.[8] Research has found that in the absence of specific drugs for COVID-19, more than half of the participants agreed that TCM could be used to prevent and treat COVID-19, and most participants were willing to take TCM to prevent COVID-19 but were unsure of its effectiveness.[19] A survey of how knowledge and practice of COVID-19 prevention measures affected supermarket employees' concerns about returning to work in 2020 found that most respondents had a positive attitude towards TCM to prevent and treat COVID-19.[16]

Most studies have discussed the influencing factors of public attitudes toward TCM epidemic prevention and control from standard personal dimensions such as TCM knowledge, satisfaction, perceived behavioral control, and subjective norms.[14,20,21] However, the above studies have not considered the highly politicized context of China's COVID-19 control. Therefore, examining the influence of politicized factors on attitudes towards TCM for the Control of COVID-19 is necessary. This study attempts to explore the impact of factors such as scientific literacy, trust, cultural values, and policy endorsement on public attitudes towards TCM for the Control of COVID-19 and discuss how cultural value factors such as nationalism moderate the role of other factors in determining attitudes towards TCM for the Control of COVID-19.

Theoretical Reasoning and Hypothesis

Demographic and Risk Factors Associated with Attitudes Toward TCM for the Control of COVID-19

While our primary interest is to reveal the factors that influence public attitudes towards TCM prevention and treatment of COVID-19, we incorporate this into a range of routine factors related to public attitudes towards TCM epidemic prevention and control. Some studies have shown that age, gender, and education level are all predictors of TCM use: older age, lower education level, and women are more likely to choose TCM.[6,15,22] In addition, relevant studies have shown that risk perception is related to TCM attitudes. The health belief model suggests that, in general, the greater the

public's perceived susceptibility and severity to disease, the more inclined they are to adopt healthy behaviors.[23,24] A survey on attitudes towards TCM epidemic prevention and control of supermarket employees in Huanggang City, Hubei Province found that 73.4% and 65.8% of participants had a positive attitude toward using TCM to treat and prevent COVID-19.[16]

In addition, a study based on Google Trends found that public interest in TCM project (including traditional Chinese medicine, Acupuncture, gua sha and Chinese Herbal Medicine) increased in Russia and Germany when they perceived the health risks of COVID-19 deaths.[25] This also indirectly indicates a correlation between the public's risk perception and Attitude toward TCM epidemic prevention and control.

H1: The more participants perceived susceptibility to COVID-19, the more likely they were to support TCM in preventing and treating COVID-19.

H2: The more participants perceived the severity of COVID-19, the more likely they were to support TCM in preventing and treating COVID-19.

Scientific Literacy Associated with Attitudes Toward TCM for the Control of COVID-19

Individual cognitive level has been proven to be related to attitudes toward TCM for the Control of COVID-19. Study participants with higher education levels were more likely to use TCM.[26] A cross-sectional survey based on the Internet found that cognition significantly positively impacts an individual's attitude towards TCM, and cognitive factors describe the extent to which a person thinks TCM is beneficial. The high average TCM awareness score indicates a high level of public recognition of the usefulness of TCM in the prevention and treatment of COVID-19, which shows also indirectly suggests that there is a significant correlation between the public's awareness of TCM and their attitude towards the TCM epidemic prevention and control.[9]

From the perspective of Knowledge-Attitude-Behavior Theory, knowledge positively affects the attitude toward behavior. Knowledge of the effectiveness of acupuncture had a positive impact on attitudes towards acupuncture.[27] A study of Hong Kong TCM users' willingness to use it similarly corroborated the positive correlation between knowledge of TCM and attitudes toward using it. Existing studies have shown that knowledge of TCM is positively correlated with attitudes toward the use of TCM, and the public's awareness of TCM is significantly correlated with their recognition of the effectiveness of TCM in the prevention and treatment of COVID-19.[20] Therefore, the following hypothesis is proposed in this paper:

H3: The higher the level of scientific literacy of participants, the more likely they were to support TCM in preventing and treating COVID-19.

Trust Associated with Attitudes Toward TCM for the Control of COVID-19

In addition, this study also examined the influence of multi-dimensional trust in attitude towards TCM epidemic prevention and control. In a healthcare system, trust can be described as confidence in receiving proper treatment when needed.[28] Many studies have confirmed that healthcare personnel are one of the primary sources of information on TCM.[17,19] Good doctor-patient communication has also been shown to positively impact many health outcomes.[3] Studies have shown that trust in TCM practitioners significantly affected attitudes towards TCM.[22] The recommendation from a conventional medical physician became the guarantee of TCM treatment quality, thus promoting patients' trust in TCM.[28] Chinese people's trust in TCM practitioners was significantly related to their attitudes towards TCM in Hong Kong. Both the use of TCM and the attitude towards TCM are related to the trust in TCM doctors.[6] A study on TCM attitudes of asymptomatic COVID-19 patients in Shanghai makeshift hospitals found that informing the attending doctor before TCM treatment was an important predictor of willingness to accept TCM treatment. This suggests that patients' trust in their attending physicians is related to their willingness to accept TCM treatment.[17] Therefore, this paper includes public trust in healthcare workers in the consideration of trust factors.

In addition to trust in medical workers, public trust in scientists is also a potential factor affecting public attitudes towards TCM epidemic prevention and control. At the beginning of the COVID-19 outbreak, Isatidis were sold out in many cities after Zhong Nanshan, one of China's top respiratory experts, said it might be able to suppress the novel coronavirus. This indicates that the Chinese public's trust in scientists directly affects their attitude toward TCM epidemic prevention and control.[26]

In addition, Crises generally provide a test for political performance, and this links them intimately to the legitimacy of and trust in ruling elites.[29] The government played a strong organizing and scheduling function in the prevention and control of COVID-19 epidemic in China. Therefore, we measured the public's trust in the central government, local government, and government officials in the trust dimension. A study on vaccination willingness among Chinese youth suggests that trust in the Chinese government reduces concerns about the safety of COVID-19 vaccines in China, thereby improving their willingness to be vaccinated.[30] Given our government's supportive attitude toward TCM, we believe that trust in the government dimension positively predicts public attitudes toward the use of TCM for COVID-19 treatments.

In summary, the following hypothesis is proposed:

H4: The higher the participants' trust in health care workers, the more likely they were to support TCM in preventing and treating COVID-19.

H5: The higher the participants' trust in scientists, the more likely they were to support TCM in preventing and treating COVID-19.

H6: The higher the participants' trust in central government, the more likely they were to support TCM in preventing and treating COVID-19.

H7: The higher the participants' trust in local government, the more likely they were to support TCM in preventing and treating COVID-19.

H8: The higher the participants' trust in government officials, the more likely they were to support TCM in preventing and treating COVID-19.

Policy Endorsement Associated with Attitudes Toward TCM for the Control of COVID-19

In the context of COVID-19 prevention, people identify with an abstract country or government and certain policies.[31] Studies have shown that policy endorsement significantly impacts the willingness to receive a booster shot.[31] Other studies have confirmed that receiving two doses of COVID-19 vaccine is important in TCM acceptance.[17] Therefore, we continue to explore the important role of the policy endorsement variable in TCM epidemic prevention and control, and propose the following hypotheses:

H9: The more participants agreed with the epidemic prevention policy, the more likely they were to support TCM in preventing and treating COVID-19.

Cultural Values Associated with Attitudes Toward TCM for the Control of COVID-19

Nationalism, as a construct, can be understood as a person's identification with their nation or people.[31] In the Chinese context, it is always associated with patriotism, showing support for the Chinese Communist Party and its policies.[32] A growing body of research has shown a link between nationalism and public health behavior. Studies have shown that in the late stage of epidemic prevention and control in China, people's level of nationalism is strongly correlated with their willingness to take preventive actions.[33]

Some studies have also found that nationalism is also an important factor affecting public attitudes towards TCM. A psychological study of factors related to the belief and use of TCM in Hong Kong Chinese showed that Chinese values are important predictors of the use of TCM in this study, including tolerance and harmony, as well as Confucian obligations. The study found a correlation between Chinese values and the use of TCM, with Confucian obligations that

included respect for tradition, nationalism, and cultural superiority positively correlated with TCM use, suggesting that those with Confucian obligations were more likely to use TCM.[6] A study of the debate on TCM among Chinese netizens in Zhihu community during the epidemic revealed the overlap between TCM supporters and Chinese Communist Party (CCP) supporters. Zhihu netizens' support for TCM is primarily influenced by its nationalist sentiment.[8] Therefore, we propose the following hypothesis:

H10: The higher the level of nationalism of participants, the more positive their attitude towards TCM in preventing and treating COVID-19.

In addition, the role of cultural cognition theory in promoting health in the COVID-19 pandemic has also attracted the attention of researchers. Cultural perception relates to a person's cultural values. It refers to an individual's tendency to fit their perceptions of risks and risks-related factual beliefs to their shared moral evaluations of putatively dangerous activities.[34] Cultural cognition theory divides values into two dimensions: hierarchism-egalitarianism and individualism-communitarianism. Specifically, individuals with individualistic values are more likely to ignore social risks if mitigation actions impede business and industrial development. Individuals with high egalitarian values see business and industry as an indictment of the elite and therefore, in need of more regulation.[34,35] The theory has been applied to research on adopting environmental and health behaviors and decisions such as HPV vaccination and climate change.[34,36] Its correlation to vaccinate against COVID-19 has also been verified: in a survey with a sample of the US public, significant negative effects of hierarchical worldview ($b=-0.70$, $p<0.01$) and individualistic values ($b=-0.49$, $p<0.01$) were observed in support of mandatory vaccination. Similarly, the study observed significant negative adverse effects of hierarchical worldviews ($b=-0.49$, $p<0.01$) and individualistic worldviews ($b=-0.46$, $p<0.01$) on the public's willingness to vaccinate. Therefore, we propose the following hypothesis:

H11: The higher the participants' collectivism level, the more positive their attitude towards TCM in preventing and treating COVID-19.

H12: The higher the participant's egalitarianism level, the more positive their attitude towards TCM in preventing and treating COVID-19.

Cultural values are not only directly related to public behavior and will, but also affect health behaviors and decisions by regulating other factors that control public thinking. For example, a study of the US public during the COVID-19 pandemic found that egalitarianism, as opposed to hierarchism, moderated the relationship between information framing and vaccination and support for vaccination requirements.[37] For the independent variables with significant regression results proposed above, this study further explores the moderating role of variables involved in nationalism and Cultural Cognition Theory. We proposed research questions:

RQ: When examining the influence of trust and policy endorsement on Chinese public attitudes towards TCM for the Control of COVID-19, what moderating role do nationalism, collectivism-individualism, and hierarchism-egalitarianism play?

Materials and Methods

This study commissioned a survey company in Shanghai to issue questionnaires in early January 2023. The research company has a sample database of more than 5 million, covering the whole country. During the implementation of the project, stratified random sampling is adopted, and members in the Online Survey Sample Database are randomly selected according to city, gender, and age. Then, the company, through the sample library management system, sent a point-to-point email to the members chosen inviting them to participate in the answer. The researchers paid the company 15RMB per questionnaire, including management fees and participant services.

After screening and data cleaning, a total of 1192 valid questionnaires were received in this study. The variables measured included attitudes towards TCM prevention, demographic variables (age, gender, monthly income, education

level), trust in institutions, risk perception, scientific literacy, policy endorsement, nationalism, collectivism-individualism, and hierarchism-egalitarianism. Next, we display the scale of each variable:

TCM Epidemic Prevention Attitudes

Recent studies have shown that many people used Lianhua Qingwen capsules/granules recommended by the National Health Commission for relieving COVID-19 symptoms.[17] In setting the question, we highlighted the name of this drug to facilitate the public's understanding: 1) Chinese medicines such as Lianhua Qingwen Capsule can effectively treat COVID-19; 2) Most scientists believe that Chinese medicines such as Lianhua Qingwen can effectively treat COVID-19; 3) There is no evidence that Chinese medicines such as Lianhua Qingwen can treat COVID-19. Among them, question three and question one to contrast each other. After problem three is reversely encoded, Cronbach's alpha of these three problems is 0.66.

Perceptions of Risk

Perceptions of risk include perceived susceptibility and perceived severity, each measured by a question. Perceived susceptibility: I am at high risk of getting COVID-19. Perceived severity: Catching COVID-19 is a significant threat to my health.

Science Literacy

Finally, we measured participants' science literacy, which was derived from an established, globally used tool. We used yes/no and multiple-choice questions to examine participants' familiarity with scientific procedures, analytical thinking, and basic scientific knowledge.

Policy Endorsement

This part mainly sets four questions based on China's epidemic prevention situation at the time of questionnaire issuance: 1) It is in the national interest to quickly infect the public with the less pathogenic Omicron and realize herd immunity; 2) No more compulsory nucleic acid testing reduces the number of confirmed cases and can ease public panic; 3) The current relaxation of prevention and control reflects the country's planned and precise control of epidemic prevention measures; 4) At present, the prevention and control can be relaxed because dynamic zero clearing has achieved a good foundation. These four questions mainly measure the participants' endorsement and support for the policy, which has a reliable reliability (Cronbach's alpha=0.69).

Nationalism

Next, we asked participants to answer six questions to measure levels of nationalism. This study uses a mature scale to test nationalism.[23] The measurement consisted of five questions and passed a reliability test (Cronbach's alpha=0.84).

Collectivism-Individualism and Hierarchism-Egalitarianism

This part of the measurement uses the Cultural Cognition theory measurement scale,[34] which has also been applied to the Chinese public values survey in the context of COVID-19. The measures at the collectivist/individualistic level consist of six main questions: 1) The government interferes too much in our daily lives; 2) Sometimes the government needs to make laws to prevent people from hurting themselves; 3) It is not the responsibility of government to try to protect people from themselves; 4) The government should stop telling people how to live their lives; 5) Government should do more to advance society's goals, even if it means limiting individual freedom and choice; 6) Governments should limit the choices individuals can make so that people do not get in the way of things that are good for society. Among them, items 2, 5, and 6 measure collectivism level. When calculating the score of this variable, we will reverse code this for average calculation. The higher the score, the higher the participants' individualism level.

The measure at the hierarchical/egalitarian level consists of six main questions: 1) We have gone too far in pushing for equal rights for people; 2) Our society would be better off if wealth were distributed more equally; 3) We need to reduce inequality between rich and poor dramatically and between men and women; 4) Discrimination against rural

people and migrant workers is still a very serious problem in our society; 5) Society has become too soft and feminine. Among them, items 2, 3, and 4 are the measure of egalitarianism level. When calculating the score of this variable, we use this reverse code for average calculation. The higher the score, the higher the participant's level of egalitarianism.

In the measurements of trust in institutions, participants were asked to select a number from 1 to 10 to indicate their level of trust, with the higher the number, the higher the level of trust.

A five-point Likert scale was adopted for risk perception and attitude towards TCM epidemic prevention and control. The seven-point Likert scale was used to measure policy endorsement, nationalism, collectivism-individualism, and hierarchism-egalitarianism, and the final scores were the mean sum of the scores of each item. Science literacy scores are calculated in different ways-one point for choosing the correct answer and no point for choosing the wrong and "I don't know" responses.

In this study, the SPSS 25.0 version was used to process the questionnaire data. Firstly, multiple linear regression was used to test the relationship between various variables and independent variables on attitude towards TCM epidemic prevention and control. Then the mediating effect of value variables was tested respectively, to explore the critical factors affecting the public's attitude towards TCM epidemic prevention and the action path of value factors in the emergency global public health events.

Results

Demographic Characteristics

Among the participants, the proportion of men is relatively large (52.8%), and the proportion of bachelor's degree is more (36.8%), followed by junior college degree (24.7%), high school degree (21.1%), junior high school degree or below (14.4%) and postgraduate degree or above (2.9%) (Table 1). The demographic data are summarized in Table 1.

Table 1 Participants' Demographic Characteristics (n =1192)

Variable	Percentage (Number of Participants)
Age	
<18	0.5 (6)
18–25	37.0 (441)
26–45	32.6 (388)
46–59	23.1 (275)
>60	6.9 (82)
Gender	
Male	52.8 (629)
Female	47.2 (563)
Education level	
Junior high school and below	14.4 (172)
Senior high school	21.1 (252)
Junior college	24.7 (294)
Bachelor degree	36.8 (439)
Postgraduate and above	2.9 (35)

(*Continued*)

Table 1 (Continued).

Variable	Percentage (Number of Participants)
Monthly income (RMB)	
3000 or less	18.9 (225)
3001–5000	45.8 (546)
5001–10,000	24.9 (297)
10,001–20,000	7.6 (91)
More than 20,000	2.8 (33)

Table 2 presents the subjects had high levels of trust in government officials, scientists, medical personnel, central and local governments, with an average of more than 5 points on a scale of 7. In addition, participants had higher levels of perceived susceptibility (M=3.99, SD=0.965) and perceived severity (M=3.84, SD=0.933). The participants had a moderate level of scientific literacy (M=0.57, SD= 0.219), a generally high level of nationalism (M=5.60, SD=1.09) and egalitarianism (M=4.65, SD=0.697), and a moderate level of collectivist individualism (M=3.78, SD=0.618).

Multiple Linear Regression

Finally, a multiple linear regression model was used to examine the relationship between demographic variables, risk perception, trust, scientific literacy, nationalism, collectivism-individualism, hierarchism-egalitarianism, and policy endorsement and attitude towards TCM epidemic prevention and control. The adjusted R^2 of this model is 0.194.

As summarized in Table 3, the first model incorporated the role of demographic variables and found that individual characteristics had little to do with participants' attitudes toward TCM epidemic prevention and control. Only education level-Bachelor degree had a weak influence on participants' attitude towards TCM epidemic prevention and control-compared with junior high school education or below, people with this characteristic were more likely to accept TCM

Table 2 The Maximum, Minimum, Mean, and Standard Deviation for Each Variable (n =1192)

Variables	MIN	MAX	M	SD
Trust in government official	1	7	5.03	1.477
Trust in scientist	1	7	5.37	1.271
Trust in medical personnel	1	7	5.60	1.100
Trust in local government	1	7	5.29	1.359
Trust in central government	1	7	5.72	1.233
Perceptions of susceptibility	1	5	3.99	0.965
Perceptions of severity	1	5	3.84	0.933
Science literacy	0	1	0.57	0.219
Policy endorsement	1	5	3.36	0.690
Nationalism	1	7	5.60	1.087
Collectivism-individualism	1	7	3.78	0.618
Hierarchism-Egalitarianism	1	7	4.65	0.697

Table 3 Multiple Linear Regression (n =1192)

Variable	Attitudes toward TCM for the Control of COVID-19					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	β	*β*	*β*	*β*	*β*	*β*
Demography						
Gender (ref. male)						
Male	0.024	0.010	0.008	0.008	0.014	−0.008
Age	−0.022	−0.035	−0.041	−0.041	−0.057	−0.054
Education (ref. Junior high school and below)						
Junior high school	0.047	0.019	0.020	0.020	0.014	0.011
Junior college	0.043	0.009	0.006	0.006	−0.019	−0.027
Undergraduate degree	0.143*	0.101	0.100	0.100	0.067	0.058
Postgraduate degree	−0.012	−0.022	−0.020	−0.020	−0.008	−0.021
Income	−0.020	−0.033	−0.031	−0.031	−0.028	−0.028
Trust						
Trust in government official		0.010	0.012	0.012	0.010	0.010
Trust in scientist		0.177***	0.177***	0.177***	0.139**	0.138**
Trust in medical personnel		0.171***	0.164**	0.164**	0.149**	0.133**
Trust in local government		−0.125*	−0.117*	−0.117*	−0.126*	−0.120*
Trust in central government		0.085	0.077	0.077	0.046	0.034
Perceptions of risk						
Perceptions of susceptibility			0.012	0.012	−0.016	−0.022
Perceptions of severity			0.046	0.046	0.024	0.019
Science Literacy						
Science literacy				0.000	0.022	0.005
Policy endorsement						
Policy endorsement					0.299***	0.293***
Cultural values						
Nationalism						0.019
Collectivism-individualism						−0.030
Hierarchism-egalitarianism						0.069*
Model statistics						
Adjusted R^2	0.008	0.093	0.093	0.092	0.172	0.175
ΔR^2	0.016	0.106	0.109	0.109	0.188	0.193
ΔF	1.932	16.552***	1.105	0.000	79.402***	1.969

Notes: *p < 0.05. **p < 0.01. ***p < 0.001.

epidemic prevention and control (β=0.143, p<0.05). However, the significance of this variable is unstable and loses its relevance after other factors is included in Model 2.

In the second model, we add variables about trust. The results showed that trust in different populations predicted participants' attitudes towards TCM epidemic prevention and control: Public trust in scientists (β=0.177, p<0.000) and medical personnel (β=0.171, p<0.000) positively predicted public attitude toward TCM epidemic prevention and control, while trust in local governments (β=−0.125, p<0.05) negatively predicted public attitude toward TCM epidemic prevention and control. The explanatory power of this model has been significantly improved, and the adjusted R^2 is 0.093. Although the trust factor has a specific predictive effect on attitude towards TCM epidemic prevention and control, it still cannot explain the difference.

The third model shows the effects of classical variables perceived susceptibility and perceived severity. In the fourth model, we measured the role of scientific literacy, and contrary to the study hypothesis, neither of these variables predicted attitudes towards TCM epidemic prevention and control.

In the fifth model, policy endorsement (β=0.299, p<0.000) has a significant positive effect. When this variable is added, the explanatory power of the whole model is also significantly improved (ΔR^2=0.172, p<0.000). At the end of the model, when we added values, only egalitarianism had a weak predictive effect (β=0.069, p<0.05).

When trust-related variables and policy endorsement are included in the model, there is a significant increase in model explanation (The ΔF are respectively 16.552 and 79.402). In general, the final explanatory power of the multivariate linear model is ΔR^2= 0.175, in which the influence of trust in institutions and policy endorsement factors on attitude towards TCM epidemic prevention and control is statistically significant (Table 3).

The Moderating Effect of Value Variables

Table 4 presents Models 7, 8 and 9, which respectively tested the moderating effects of cultural value factors nationalism, collectivism-individualism and hierarchism-egalitarianism on the significant variables of the above model. In other

Table 4 The Moderating Effect of Value Variables (n =1192)

Variable	Attitudes Toward TCM for the Control of COVID-19		
	Model 7	Model 8	Model 9
	β	β	β
Demography			
Gender (ref. male)			
Male	0.024	−0.054	−0.011
Age	−0.022	−0.009	−0.048
Education (ref. Junior high school and below)			
Junior high school	0.047	0.015	0.012
Junior college	0.043	−0.023	−0.0325
Undergraduate degree	0.143	0.063	0.061
Postgraduate degree	−0.012	−0.023	−0.025
Income	−0.020	−0.022	−0.035
Trust			
Trust in government official	0.009	0.025	0.010
Trust in scientist	0.152**	0.137**	0.130**

(*Continued*)

Table 4 (Continued).

Variable	Attitudes Toward TCM for the Control of COVID-19		
	Model 7	**Model 8**	**Model 9**
	β	**β**	**β**
Trust in medical personnel	0.131*	0.133*	0.146*
Trust in local government	−0.135*	−0.122*	−0.134*
Trust in central government	0.052	0.037	0.049
Perceptions of risk			
Perceptions of susceptibility	−0.025	−0.030	−0.015
Perceptions of severity	0.021	0.020	0.014
Science Literacy			
Science literacy	0.011	0.005	0.002
Policy endorsement			
Policy endorsement	0.284***	0.304***	0.295***
Social values			
Nationalism	0.011	0.030	0.017
Collectivism-individualism	−0.024	−0.028	−0.015
Hierarchism-egalitarianism	0.078*	0.069*	0.071*
Interactive items			
Policy endorsement× nationalism	−0.083		
Trust in scientist× nationalism	0.085		
Trust in medical personnel× nationalism	0.069		
Trust in local government× nationalism	−0.071		
Policy endorsement× Hierarchism-Egalitarianism		−0.043	
Trust in scientist× Hierarchism- Egalitarianism		0.118**	
Trust in medical personnel× Hierarchism- Egalitarianism		0.020	
Trust in government official ×Hierarchism- Egalitarianism		−0.060	
Policy endorsement× Collectivism-Individualism			0.062
Trust in scientist× Collectivism-Individualism			−0.087*
Truston medical personnel× Collectivism-Individualism			−0.025
Truston local government× Collectivism-Individualism			0.030
Model statistics			
Adjusted R^2	0.178	0.180	0.179
ΔR^2	0.007	0.010	0.008
ΔF	1.888	2.427*	2.039

Notes: *p < 0.05. **p < 0.01. ***p < 0.001.

words, the variables of policy endorsement, trust in scientist, trust in medical personnel and trust in local government were adjusted respectively.

As summarized in Figure 1, collectivism-individualism negatively moderated the influence of public trust in scientists on attitude towards TCM epidemic prevention and control. In other words, compared with individualism (−1 SD), the higher the level of collectivism (+1 SD), the greater the influence of public trust in scientists in TCM epidemic prevention and control.

Figure 2 shows that hierarchism-egalitarianism positively moderates the effect of trust in scientist' degree of attitude towards TCM epidemic prevention and control. That is, compared with those with a high level of hierarchism (−1 SD),

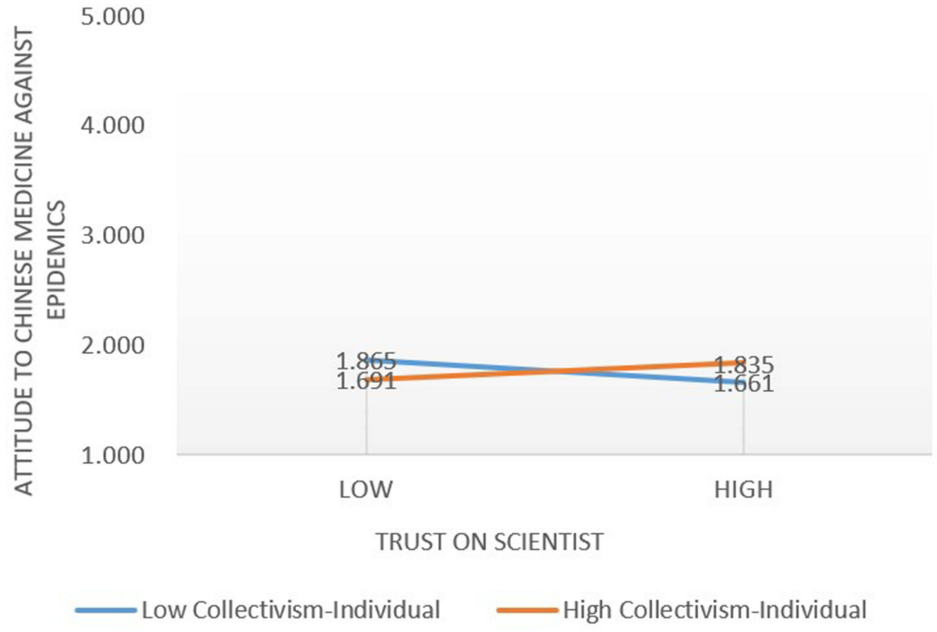

Figure 1 The mediating role of Collectivism-Individualism.

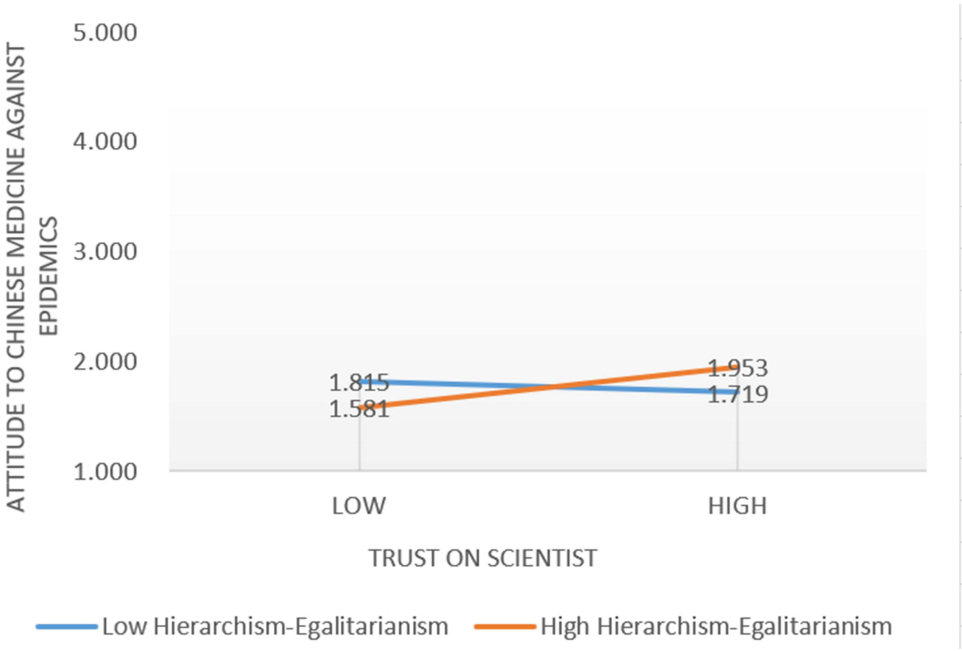

Figure 2 The mediating role of Hierarchism–Egalitarianism.

the higher the level of egalitarianism (+1 SD), the greater the influence of attitude towards TCM epidemic prevention and control on public trust in scientist level.

Discussion

This finding provides new evidence for the role of cultural values in Chinese public attitudes towards TCM epidemic prevention and control. Compared with conventional variables such as scientific literacy and risk perception, trust, policy endorsement, and cultural values, played a leading role in our study. This study places the survey of public attitudes towards TCM epidemic prevention and control in China's special remarkable political and cultural background, which is a valuable supplement to previous studies. This empirical study on attitudes towards TCM epidemic prevention provides a reference for researchers and practitioners to better understand the controversy of TCM and the public's attitudes towards TCM for disease prevention and healthcare.

The failure of basic variables, including scientific literacy and risk perception, in predicting public attitudes towards TCM epidemic prevention indirectly proves the possible defects of Knowledge attitude belief and practice model (KAP model). The addition of some trust factors, value factors and political factors that have a significant impact on public attitudes towards TCM epidemic prevention will help to form a new theoretical integration model. But further research is needed to confirm our findings.

Overall, for the research hypotheses proposed at the beginning of this paper, the data results supported H4/H5/H9/H12, ie, trust in scientists, healthcare professionals, agreement with policies, and level of egalitarianism positively predicted the role of TCM for use in COVID-19 among the Chinese public. The testing results of hypotheses are summarized in Table 5. For the explored research questions on the moderating effects of nationalism, collectivism-

Table 5 Testing Results of Hypotheses

Hypotheses	Testing Results
H1: The more participants perceived susceptibility to COVID-19, the more likely they were to support TCM in preventing and treating COVID-19.	Rejected
H2: The more participants perceived the severity of COVID-19, the more likely they were to support TCM in preventing and treating COVID-19.	Rejected
H3: The higher the level of scientific literacy of participants, the more likely they were to support TCM in preventing and treating COVID-19.	Rejected
H4: The higher the participants' trust in healthcare workers, the more likely they were to support TCM in preventing and treating COVID-19.	Supported
H5: The higher the participants' trust in scientists, the more likely they supported TCM in preventing and treating COVID-19.	Supported
H6: The higher the participants' trust in the central government, the more likely they were to support TCM in preventing and treating COVID-19.	Rejected
H7: The higher the participants' trust in local government, the more likely they were to support TCM in preventing and treating COVID-19.	Reversely
H8: The higher the participants' trust in government officials, the more likely they supported TCM in preventing and treating COVID-19.	Rejected
H9: The more participants agreed with the epidemic prevention policy, the more likely they supported TCM in preventing and treating COVID-19.	Supported
H10: The higher the level of nationalism of participants, the more positive their attitude towards TCM in preventing and treating COVID-19.	Rejected
H11: The higher the participants' collectivism level, the more positive their attitude towards TCM in preventing and treating COVID-19.	Rejected
H12: The higher the participant's egalitarianism level, the more positive their attitude towards TCM in preventing and treating COVID-19.	Supported

individualism, and hierarchism-egalitarianism, it was found that hierarchism positively moderated trust in scientists, and on the other hand, individualism negatively moderated trust in scientists.

This study differs from previous studies in that among the demographic variables surveyed, including age, education level, gender, and income, only the level of education as a bachelor's degree on slightly influenced participants' attitudes towards TCM epidemic prevention and control. In general, demographic variables in this study did not play a significant role in subjects' attitudes towards the use of TCM in the prevention and treatment of COVID-19. This also goes some way to show that individual-level factors have not played a more vital role in influencing health behaviors in the context of the COVID-19 pandemic.

Neither perceptions of susceptibility nor perceptions of severity predicted the public's attitude toward TCM epidemic prevention and control. This may be caused by the relaxation of the control policy implemented by the Chinese government. After the implementation of the policy, the number of positive patients soon reached the peak of infection, and the virus became weaker and weaker with the passing of time, which may weaken the role of individual risk perception on the formation of public attitude towards TCM epidemic prevention and control to some extent.

Unlike earlier studies on attitudes towards TCM, scientific literacy variables did not predict substantially attitudes towards TCM use in COVID-19. This is not the first time a failure in scientific literacy has been identified, with this variable not showing a significant correlation in a series of surveys of the Chinese public's willingness to vaccinate against COVID-19. This may be due to the particular situation of the global public health crisis; the public believes that general scientific literacy, including scientific knowledge, understanding of scientific methods, and scientific spirit, cannot guide their behavior and choices. Another possible reason is the unique nature of TCM. TCM advocates observing life phenomena from holistic thinking and is closely related to traditional Chinese holistic review such as the I Ching, Yin and Yang, and the five elements. From the 17th century to the 21st century, the study of natural science is dominated by reductionism.[38–40] Reductionism disassembles things and exhausts the components of things, which is contrary to the systematic thinking of TCM. As a result, scientific literacy based on experimental, truth-proof, statistical reductionist scientific research methods cannot predict the attitude of TCM in COVID-19 prevention and control.

In Model 2, public trust in scientists and medical personnel positively correlates with attitude towards TCM epidemic prevention and control. In contrast, trust in local government is negatively correlated with TCM epidemic prevention and control. The trust of government officials and the central government had no significant impact, possibly because of the "poor level of political trust" in Chinese society.[41,42] Based on Fei Xiaotong's "differential order pattern" of Chinese society,[43] Li Lianjiang called the phenomenon of government trust between the central government higher than the local government and the more elevated than, the lower level as "differential order government trust"[44] which seems to verify this concept in our statistical results, and further reflects the different effects of different levels of government trust in the attitude of traditional Chinese medicine in epidemic prevention. Our H4 and H5 were supported, which may be related to the media exposure of the public, and many studies have confirmed that the media and medical personnel are the primary sources of information about Chinese medicine. Scientists and medical staff have been exposed to the media during this epidemic and have carried out a lot of science popularization work on epidemic prevention and control through the media and other channels. For example, scientists such as Zhong Nanshan and Zhang Wenhong have acted as opinion leaders, and their public comments on epidemic prevention and control through the media have subtly influenced the public's attitude towards TCM epidemic prevention and control.

Policy endorsement was positively correlated with attitudes toward TCM epidemic prevention and control, which may be related to public recognition and support for effective TCM programs promoted by the National Health Commission in epidemic prevention and control. Among the variables related to cultural values, only egalitarianism played a weak positive predictive role, while patriotism and collectivism did not play a predictive function. Overall, social factors involving trust in government and nationalism did not influence public attitudes towards TCM epidemic prevention and control. Still, endorsement to COVID-19 epidemic prevention policy significantly positively predicted the dependent variable. In combination with the specific context of the COVID-19 pandemic may lead us to make the following conjectures: Compared with the macro values of trusting the government and being proud of one's country, compliance with epidemic prevention policies, which is more closely related to the current environment is more likely to influence public acceptance of the use of TCM in public health emergencies.

However, we found that collectivism and egalitarianism weakly contribute to the positive correlation between public trust in scientists and attitudes toward TCM epidemic prevention and control, respectively. Combined with the results of linear regression, this suggests that the value factors play non-negligible direct and indirect roles in the public attitudes towards the application of TCM, and due to the constraints of the objective conditions, this paper has not been able to tap into the whole mechanism of its functioning, which is worth exploring in depth.

In addition, our study has some limitations that need further improvement. First of all, this study analyzes cross-sectional data obtained from a questionnaire survey, which can be further studied in combination with other research methods in the future to ensure the reliability of causal inference. Secondly, with the changes of the epidemic situation, the relationship between different independent variables and attitude towards TCM epidemic prevention and control may change, which is worth further investigation and comparison. Finally, the influence of patient's previous experience of TCM and relevant TCM knowledge on public attitudes towards TCM could further examine in the following studies.

Conclusion

Overall, this study reveals cultural values' unique role and mechanism in influencing public attitudes toward TCM epidemic prevention and control. Unexpectedly, unlike previous studies, there was no significant correlation between cultural values such as nationalism and public attitudes towards TCM epidemic prevention and control in this study. Still, some cultural values had some moderating effects between trust and attitudes towards TCM epidemic prevention and control. This study reveals the differential roles of trust in different institutions or groups, policy deference, and egalitarian values on public attitudes towards TCM adoption in the specific context of the COVID-19 pandemic and finds a moderating role for hierarchism-egalitarianism and collectivism-individualism between trust in scientists and public attitudes. This study will help researchers and practitioners understand the importance of cultural values, trust, policy endorsement, and attitudes towards TCM epidemic prevention to TCM's use in healthcare.

Thus, it is necessary to take several measures that will help increase public acceptance and use of TCM epidemic prevention and control, including strengthening scientists' health science popularization of TCM epidemic prevention and control, active and effective communication between doctors and patients, and increasing media publicity, especially on social media such as WeChat. At the same time, we can use public nationalism and other psychological states to improve the effect of persuasion, further enhance the public's trust in scientists and medical personnel, and recognize epidemic prevention policies to improve the public's acceptance of TCM epidemic prevention and control. Of course, these practices would also make sense in primary healthcare, and would help improve public health-related outcomes and promote public acceptance and trust for TCM care.

Ethics Approval and Consent to Participate

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of the School of Communication, Soochow University and informed consent was taken from all individual participants.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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