

Examining the Effect of Social Media Use on COVID-19 Vaccine Hesitancy in China

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Abstract. Public willingness to vaccinate has become an important public health issue given the vaccine hesitancy observed worldwide in recent decades. And social media is the main way of information dissemination, and will bring a great impact on people in public health events. The present paper analyzes the relationship between vaccinated Chinese people's vaccine attitudes and social media information networks. This study aims to explore the impact of social media use on vaccine hesitancy by generating a descriptive statistical and structural model analysis of vaccine hesitancy-relevant content. In this study, the influence model between social media use behavior and vaccination willingness was constructed from three perspectives, including contact intensity, social media trust, and social media information satisfaction. Questionnaires were distributed online, and relevant data analysis software was used. In China, public enthusiasm for the covid-19 vaccine is generally high, and news on social media may have an impact on the willingness to receive the vaccine. Additionally, the Chinese government's COVID-19 control policies make people who are not willing to actively vaccinate will be vaccinated for their daily life and work reasons. All these reflect the low correlation between vaccination and media publicity. Therefore, social media has a certain impact on COVID-19 vaccination behavior, but it is not the main factor affecting public vaccination.

Keywords: Internet, social media, online information, vaccines, vaccine hesitancy

1. Introduction

A great deal of research demonstrates that vaccine hesitancy remains a barrier to full population inoculation against highly infectious diseases, and vaccine hesitancy is one of the top ten current threats to human health [1]. The COVID-19 epidemic outbreak was declared a public health emergency of international concern (PHE-IC) by the World Health Organization on January 30th, 2020. And corresponding to the rapid development of COVID-19 vaccines globally, concerns about the safety of a rapidly developed vaccine without full clinical trials could be a factor that contributes heavily to its vaccine hesitancy [2].

The social media in China has become a netizen online the most active and influential widely network platform. The level of media trust not only reflects the audience's evaluation of the media but also represents the audience's trust in the political authority and the media's political identity to a certain extent. In the context of new media, audience access to information is no longer a single channel and people get health information from a variety of sources, including new media such as the Internet and social media platforms, thus may exacerbate the hesitation about vaccines. So the posting of anti-vaccine messages on these platforms raises considerable public health issues

and the potential for vaccine hesitancy. In this study, we discuss the impact of Chinese social media platforms in spreading vaccine hesitancy and explore the impact of different types of social media platforms and different types of transmission agents contained on people's vaccination ideas.

2. Literature Review and Hypotheses

Social media trust. Social media platforms are Internet-based applications that enable communities of users to create, interact, and share with others, with multiple platforms for different content types [3, 4, 5, 6]. They allow real-time communication between quasi-peer-peer networks, allowing users to actively participate in public discourse [5, 7]. Trust in social media use and information sharing is widely covered in the previous literature. When users trust a social media platform, they will exert less effort to scrutinize details or assess the authenticity of the services offered [8]. And the more they want to use that social media platform in order to gratify their needs [9]. Similarly, when trust exists between individuals and within a particular social media platform, users are more willing to participate in the shared activity [10]. In the research on the influence of social media use on media trust, Chinese scholars mainly focus on the

research of audience behavior characteristics under the background of new media and the trust research of social media such as Weibo and WeChat. Researchers conducted a questionnaire survey on Weibo, QQ space and WeChat Moment, and used the regression analysis method to analyze the obtained data. The results showed that media dependence, interactivity, media transparency, argument strength, and information quality have a positive effect on information credibility. To sum up, we believe that social media use will have a significant correlation with social media trust, thus we make hypotheses that the use of social media is related to social media trust:

Hypotheses 1 (H1): Social media use has a positive impact on social media trust.

H1a: Social media use time is positively correlated with social media trust.

H1b: Social media use frequency is positively correlated with social media trust.

H1c: Social media interaction frequency is positively correlated with social media trust.

Social Media and Vaccine Hesitancy. Public skepticism and resistance to vaccines have existed almost since their inception. With the transformation of times, the important role of vaccines in the prevention of infectious diseases has become increasingly prominent, but the opposition or doubts about vaccination have never ceased [11]. Group-level vaccine hesitancy can be traced back to the working-class opposition to compulsory smallpox vaccination in the UK in the mid-19th century [12]. In 1908, the United States also had a large-scale anti-dengue vaccine campaign [13]. A large population study in the UK in 2000 found that three-quarters of parents who had not given their children the combined measles, mumps, and rubella vaccine (MMR) said they would not do so in the future [14]. Such phenomena have also attracted the attention of the academic community. In the conclusions and recommendations on vaccine hesitancy of the WHO immunization Strategy Advisory Group of Experts (SAGE), vaccine hesitancy is defined as “delay in acceptance or refusal of safe vaccines despite availability of vaccination services” [15].

Despite the academic vaccine hesitancy, conceptual ambiguity remains, and measurements vary widely across different studies [16]. It is widely believed that receiving vaccination is an outcome behavior resulting from a complex decision-making process and may be influenced by multiple factors. Vaccine hesitancy is complex and context-specific, varying across time, place, and vaccines. And it is a common research approach that using a database and a network analysis of vaccine-related content, quantitative and qualitative studies of online media samples to draw relevant research conclusions to measure how social media influences vaccination, as well as awareness, knowledge, and attitudes towards vaccines. Raw data collection for social media and vaccines provides how social media content influences vaccine-related knowledge, attitudes, or behaviors [17].

Although there have been a lot of studies on social media platforms such as Twitter and Facebook [18, 19, 20], we are unclear about the current emotions and attitudes of Chinese people towards Covid-19 vaccination.

Furthermore, only a few studies have examined the relationship between social media background and public sentiment about vaccination [21]. According to the general research results of the above studies, most Western public shows obvious vaccine hesitancy, and their social media use will amplify the vaccine hesitancy. Nevertheless, combining the different social contexts in China, we assume that special results will be obtained. Therefore, we hypothesized that there are correlations between social media use and vaccine hesitancy under the Chinese horizon:

Hypotheses 2 (H2): Social media use has a positive impact on vaccine hesitancy

H2a: Social media usage time is positively correlated with vaccine hesitancy

H2b: Social media use frequency is positively correlated with vaccine hesitancy

H2c: Social media interaction frequency is positively correlated with vaccine hesitancy

Social media plays an important role in changing individual health attitudes and intervening in health behaviors in the internet era. At present, many studies have also confirmed the impact of social media on vaccine hesitancy. For example, Puria [22] explains that audience in the process of using social media, trust in social media creates a natural sense of trust in the information spread on the platform. Therefore, in the face of some information beyond their own cognition, they often naturally trust the health information transmitted by the platform under the premise of trust in the platform, and naturally, accept the information.

In addition to social media trust, we suppose that the higher the frequency of individuals contacting media information, the better the effect of health information acquisition; the higher the trust degree of media, the better the audience is to obtain information, and the better the effect of health information acquisition. In view of the increasing amount of time spent on social media, individuals are naturally subtly influenced by information and take corresponding behavior choices under the instigation of information. This means that the high frequency of information exposure also affects the audience's thoughts and vaccination behaviors. As for the relationship between social media vaccine-related information trust/satisfaction and vaccine hesitancy, we make the following hypotheses:

Hypotheses 3 (H3): Social media official trust has a negative impact on vaccine hesitancy

H3a: The official social media information source content has a higher degree of trust

H3b: Trust in official information sources is negatively correlated with vaccine hesitancy

H3c: Trust in unofficial information sources is negatively correlated with vaccine hesitancy

Hypotheses 4 (H4): Social media vaccination information satisfaction is negatively correlated with vaccine hesitancy

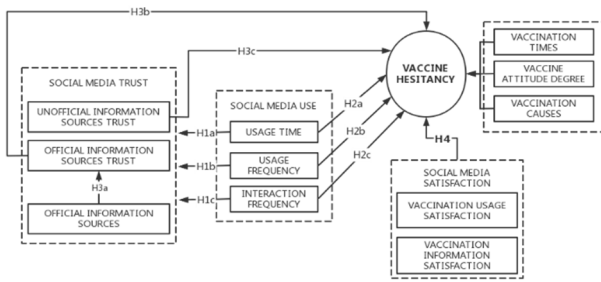


Figure 1. Conceptual model

3. Sampling and Methodology

An online questionnaire was constructed. Data collection was executed in April 2022. The questionnaire was distributed through random online clicks. The invitation to participate in the questionnaire was disseminated through social media, such as WeChat and Weibo, and some questionnaire platforms. The questionnaire consisted of two blocks, some questions about demographic characteristics of the participants and a number of 5-point Likert scales which include the measures of variables such as social media use, social media trust, and social media satisfaction, and vaccine attitudes. And the Cronbach's coefficient value of the model is 0.972, indicating that the reliability of the questionnaire meets the requirements.

For the data analysis and the validation of the hypotheses, the spearman's correlation test was used to detect the association degree between the variables. Besides, the model for the study of structural equations was used, which has its origin in variances (SEM). This model makes it possible to statistically analyze the predicted relationships by predicting the dependent variables, which makes it possible to calculate and quantify the direct and indirect effects of the variables on each other.

In the present study, a total of 407 questionnaire responses were obtained in the final sample. Therefore, the sample was sufficient for the analysis using the PLS-SEM technique. The PLS-SEM analysis was performed using SPSS 25.0, a widely used and reliable software.

4. Analysis Results

Descriptive Analysis. 407 participants responded in two weeks, among them 199 (48.894%) were females and 208 (51.106%) were males. The female to male ratio was 1: 1.045. There were 5 age groups and the response from each group is shown in Table 1. The main sources of information were internet questionnaire platforms and some social media (including WeChat, Weibo, Douban).

Table 1. Characteristics of the study participants (n = 407)

Classification Variable	Variable	Frequency	Percentage (%)	Cumulative percentage (%)
Gender	Male	208	51.106	51.106
	Female	199	48.894	100.000
Age	< 18	22	5.405	5.405
	18-23	206	50.614	56.019
	24-29	97	23.832	79.851
	30-35	53	13.022	92.873
	>36	29	7.127	100.000
Minutes devoted to social media per day	More than 4 hours	143	35.135	35.135
	1 Hour-2 Hour	124	30.467	65.602
	30 Minutes-1 Hour	78	19.165	84.767
	Within 30 minutes	43	10.565	95.332
	Do not use social media	19	4.668	100.000

In terms of the preferred social platform, the respondents were given the possibility to check more than one option. Most participants used WeChat (5.292/6) more frequently, followed by short video platforms (4.472/6) and browser (4.115/6). Next is social media for video sites (4.086/6) and Weibo (3.855/6). Other kinds of social media were relatively few used by participants.

Table 2. Social media use frequency measurement of participants (n = 407)

Variable	maxim um	minim um	mean	Std. Deviation	Median	Varian ce	Kurto sis	Skewn ess	Coeffici ent of Variatio n (CV)
Weibo	6	1	3.855	1.82	4	3.311	-1.312	-0.274	0.472
WeChat	6	1	5.292	1.034	6	1.069	2.111	-1.549	0.195
Browser	6	1	4.115	1.428	4	2.038	-0.778	-0.286	0.347
Q&A platform	6	1	3.415	1.615	3	2.608	-1.037	0.164	0.473
Online forum	6	1	2.496	1.726	2	2.98	-0.593	0.87	0.691
Video website	6	1	4.086	1.631	4	2.66	-0.943	-0.423	0.399
short video	6	1	4.472	1.675	5	2.806	-0.485	-0.881	0.375

Variable	maximum	minimum	mean	Std. Deviation	Median	Variance	Kurtosis	Skewness	Coefficient of Variation (CV)
platform Other social media	6	1	3.59	1.715	4	2.942	-1.264	-0.059	0.478

According to the questionnaire survey results, most participants showed positive attitudes towards vaccines, accounting for 81.482/100 (0-100 is negative to positive). Moreover, as shown in Table 3, the attitude towards vaccine effectiveness on the Likert scale was 4.425/5 (1-5 is strongly disagree to strongly agree). The median was 5 which demonstrated the high trust in vaccine effectiveness. Conversely, the results illuminated that public attitudes towards vaccine side effects were not high, with the mean of the Likert scale being only 2.897/5.

Table 3. Vaccine attitude of participants (n = 407)

Variable	maximum	minimum	mean	Std. Deviation	Median	Variance	Kurtosis	Skewness	CV
Vaccine attitude (0-100 indicates negative/positive)	100	0	81.482	22.261	88	495.57	2.52	-1.572	0.273
Think the vaccine is effective	5	1	4.425	0.847	5	0.7183	3.846	-1.839	0.191
Worried about the vaccine's side effects	5	1	2.897	1.29	3	1.664	-	1.013	0.445

The data showed that 96.806% of the participants who finished the questionnaire were vaccinated with the COVID-19 vaccine. A five-point scale was set for the causes of vaccination to indicate consent (1-5 is strongly disagree to strongly agree). The main reason for vaccination was for your own health/to prevent COVID-19 (mean = 4.729/5). The other important concerns

included trust in the government/relevant departments (mean = 4.612/5) and Community/unit requirements (mean = 4.376/5). Unlike the above situation, the participants were relatively less influenced by the media. Participants' reasons for being vaccinated by the persuasion of media or others were not prominent (mean = 3.667/5, mean = 3.535/5).

It was observed from the survey that active vaccination causes were slightly higher than passive causes. We classify "for health/prevention, free vaccine, trust in government" as motivation for active vaccination. Community/job needs were defined as passive vaccination.

Hypotheses Verification. This section verified and detected the hypotheses made above. Overall, the test results largely conformed to the hypothesis. The frequency of social media use (Table 4) and interaction

(Table 5) was positively correlated with social media trust. The content of official social media sources was more trusted by the public which was negatively associated with vaccine hesitancy. In the measurement of information sources trust, government agency sources, mainstream media, and scientific research institutions as representatives of official information sources showed higher public trust than other information sources, and all demonstrated a significantly positive correlation with vaccine attitudes (Spearman coefficients: 0.428, 0.389, 0.392). The frequency of social media interaction was positively correlated with vaccine attitude. It was observed that vaccine information satisfaction on social media was negatively correlated with vaccine hesitancy (Table 6).

Table 4. The correlation of social media use frequency and social media trust

(n = 407)

Variables	N	Spearman Correlation coefficient	Sig. (2-tailed)
Weibo	407	.406	.000
WeChat	407	.331	.000
Browser	407	.406	.000
Variables	N	Spearman Correlation coefficient	Sig. (2-tailed)
Q&A platform	407	.508	.000
Online forum	407	.502	.000
Video website	407	.436	.000
short video platform	407	.600	.000
Other social media	407	.510	.000

According to Table 5, overall, the correlation between the interaction degree of Weibo and trust is the highest with each item exceeding 0.500, which can be regarded as the biggest public opinion field in China. Original content on video sites can generate more trust in social media. It is worth noting that the use of one of the most popular social media forms today—the short video platform and trust correlation compared with other social media is low. The main reason may be the low threshold and the large number of short video creations. Therefore, although the use of short video frequency is high (Table 2), its interaction and social media trust correlation are not high. As can be seen from Table 5, the correlation between social media interactions and vaccine attitude is very weak, no clear correlation can be observed between social media interaction and vaccine hesitancy. But in general, social media interactions and public trust in social media have a significant impact.

Therefore, we can speculate that social media interactions are intended to participate in topic discussions, and vaccine information needs to be confirmed by scientific research. It is difficult for people to improve their attitudes towards vaccines from ordinary discussions. Additionally, When people personally participate in the public opinion discussion, they can actually increase their trust in the social media where the interactions occur.

Table 5. The correlation of social media interaction frequency and social media trust/vaccine attitude (n = 407)

	Original content	Likes	Comments	Forward	Organize / participate in network events
Weibo	0.513 (0.000* **)	0.511 (0.000* **)	0.533 (0.000* **)	0.504 (0.000* **)	0.544 (0.000* **)
WeChat	0.424 (0.000 ***)	0.435 (0.000 ***)	0.396 (0.000 ***)	0.407 (0.000 ***)	0.375 (0.000 ***)
Browser	0.417 (0.000 ***)	0.392 (0.000 ***)	0.426 (0.000 ***)	0.417 (0.000 ***)	0.419 (0.000 ***)
Q&A platform	0.457 (0.000 ***)	0.368 (0.000 ***)	0.438 (0.000 ***)	0.445 (0.000 ***)	0.470 (0.000 ***)
Online forum	0.477 (0.000 ***)	0.364 (0.000 ***)	0.463 (0.000 ***)	0.460 (0.000 ***)	0.474 (0.000 ***)
Video website	0.531 (0.000 ***)	0.465 (0.000 ***)	0.498 (0.000 ***)	0.495 (0.000 ***)	0.501 (0.000 ***)
short video platform	0.391 (0.000 ***)	0.403 (0.000 ***)	0.454 (0.000 ***)	0.430 (0.000 ***)	0.417 (0.000 ***)

	Original content	Likes	Comments	Forward	Organize / participate in network events
Other social media	0.479 (0.000 ***)	0.480 (0.000 ***)	0.564 (0.000 ***)	0.561 (0.000 ***)	0.592 (0.000 ***)
The correlation of social media vaccine information interaction and vaccine attitude	0.282 (0.000 ***)	0.252 (0.000 ***)	0.151 (0.002 ***)	0.144 (0.004 ***)	0.206 (0.000 ***)

Table 6. The correlation of social media vaccine information satisfaction and vaccine attitude

Sublatent variable	Variables	N	Spearman Correlation coefficient	Sig. (2-tailed)
Social Media satisfaction	Obtain accurate information	407	.382	.000
	Obtain instant information	407	.380	.000
	Obtain comprehensive information	407	.322	.000
	Record daily life	407	.343	.000
	Entertainment and leisure	407	.301	.000
	Get a sense of identity	407	.327	.000
	Keep in touch with families and friends	407	.313	.000
Social media vaccine information satisfaction	Complete the daily work and communication	407	.270	.000
	Get accurate about vaccination-related information	407	.343	.000
	Obtain COVID-19 disease prevention information	407	.338	.000
	Know public attitude towards vaccines	407	.377	.000
	Know the relationship between vaccination and COVID-19 prevention	407	.416	.000

Besides, in the classification of Weibo, WeChat, browser, Q&A platforms, online forums, video websites, short video platforms and other social media, only the frequency of online forums is negatively correlated with vaccine attitudes. Among other social media categories, despite the positive correlation effect, the degree is still low. And in contrast, official sources do have higher trust

and are negatively correlated to vaccine hesitancy. Conversely, unofficial vaccine information sources cannot conclude about a positive impact on vaccine attitudes. In addition to the verified hypotheses above, social media use time is not positively correlated with social media trust or vaccine hesitancy, absolutely not in line with the hypotheses.

Structural Model Analysis. The model was built by linear regression analysis of participants' social media use frequency and vaccine attitude. According to the research results, the variable validation factor analysis results are good, and the model fit degree index meets the premise requirements of the structural equation model analysis. In this section, structural equation model testing was conducted to view the established relationship of the hypotheses, and the result is shown below (Table 7):

Table 7. Models of social media use frequency and vaccine attitude (n=407)

Linear regression analysis results n=407									
	Non-standardized coefficient		Standardized coefficient Beta	t	p	VIF	R ²	Adjusted R ²	F
	B	Std. Error							
Constant	43.002	5.864	-	7.333	0.000**	-	0.135	0.117	F=7.751 P=1.119
Weibo	0.682	0.721	0.056	0.946	0.345	1.599			
WeChat	3.210	1.151	0.149	2.79	0.006**	1.314			
Browser	1.728	0.935	0.111	1.847	0.065*	1.655			
Q&A platform	-0.292	0.936	-0.021	0.312	0.755	2.121			
Online forum	-1.832	0.824	-0.142	2.227	0.027**	1.881			
Video website	2.862	0.775	0.21	3.695	0.000**	1.482			
short video platform	1.309	0.689	0.098	1.9	0.058*	1.236			
Other social media	-0.063	0.811	-0.005	0.078	0.938	1.795			
Dependent variable: COVID-19 vaccine attitude (0-100 means negative-positive)									

Note. ***, ** and * represent the significance levels of 1%, 5% and 10%

From the analysis of the results of the F test, the significance p value is 0.000***, the level is significant, and the null hypothesis of regression coefficient of 0 is rejected, so the model basically meets the requirements. For the variable collinearity performance, the VIF is all less than 10, so the model has no multicollinearity problem. The formula for building a good model is as follows :

$$(y=43.002+0.682* \text{ Weibo use frequency} +3.21* \text{ WeChat use frequency} +1.728* \text{ Browser use frequency}+ (-0.292)* \text{ Q\&A platform use} + (-1.832)* \text{ Online forum use frequency} +2.862* \text{ Video website use frequency} +1.309* \text{ Short video platform use frequency} + (-0.063)* \text{ Other social media use frequency})$$

Similarly, we examined the correlation between vaccination reasons and vaccine attitudes with the highest

correlation in “ Trust in the government/relevant departments” at 0.391; followed by “For own health/to prevent COVID-19 ” (0.302); free vaccination and working community requirements at 0.244 and 0.231; and the lowest correlation was news mobilization at 0.191.

As can be seen from the above models, the social media use and vaccine attitude model to some extent can be observed as significance, but most variables did not show effectiveness, consequently, the inference of social media use and vaccine attitudes correlation still shows the weak state.

5. Conclusions

Vaccine hesitancy is a global coexisting problem that has a huge impact on major public health events. Under the scope of COVID-19 vaccination in China, research conclusions with regional particularity can be obtained after data collection and investigation.

l The Chinese public shows a more positive vaccine attitude with no obvious correlations to demographic characteristics.

From the descriptive statistical analysis results, the vaccination of Chinese mainland people showed low correlations or no significant correlations with gender, age, or educational background. This is approximately in line with many studies on Chinese attitudes towards the COVID-19 vaccine, for instance, the results of Zhang et al [23] pointed out that when positive news about COVID-19 vaccines occurred, the public would be more positively sentimental about the vaccine and vice versa, which was consistent with the results of this study. Additionally, the vaccination rate was as high as 96.8%, and most people had a very high positive attitude towards the vaccine, reaching 81.482/100, which can be confirmed in sentiment analysis on most Chinese social media platforms.

ll High government trust and high official information trust.

The Chinese public had a high degree of trust in government and official information sources, such as 4.457/5 of government agencies and 4.231/5 of mainstream media, which is also reflected in the reasons for their vaccination (4.612/5) and the evaluation of vaccine reliability (4.425/5). According to the report of ‘Edelman Trust Barometer 2022’ released by the world's largest public relations consulting firm, Chinese trust in the government reached 91% in 2021, ranking first in the world. In terms of the national comprehensive trust index, China reached 83%, up 11% year on year, ranking first in the world. The results of the present study are basically the same as the Edelman report, and the Chinese have always shown high trusts in the government and official institutions, which may be related to the social environment and cultural contexts in China. Therefore, in the vaccination reasons survey of the questionnaire, the reason "trust in government and relevant institutions" ranked second (4.612/5), after “for their own health/prevent COVID-19”(4.729/5), and much higher than the media reasons (3.667/5).

III Social media use contributes to Chinese vaccination to some extent.

The analysis found that social media use showed almost every positive correlation with vaccine attitudes, indicating that information taken from social media gave them more trust in vaccine effectiveness and increased willingness to vaccinate. This result is contrary to relevant studies in most western countries. Most relevant studies in the United States or Europe showed that social media use increased vaccine hesitancy which reduces the public's willingness to vaccinate. For instance, exposure to vaccine-critical websites and blogs negatively impacts the intention to vaccinate [24, 25]. In comparing users' perceptions of vaccine risks amongst those exposed to control websites versus vaccine-critical websites, Betsch et al [24] found that even brief exposure to vaccine-critical websites increased the overall perception of vaccine risk in comparison to exposure to control websites. However, in the context of different discourse systems in China, due to the strong credibility of the government and officials, Chinese people are accustomed to trusting the official sources on social media.

IV The weak correlations between vaccine attitude, vaccination willingness, and social media.

The Chinese people's vaccine attitude and willingness are only weakly correlated with local news promotion and social media use. Despite showing significant correlations, most of these correlation factors were low in both social media use or social media trust and vaccine attitudes. Based on the results above, the Chinese high trust in vaccines is largely an extension of government trust, rather than based on their judgment that they are influenced by outside information. Since vaccination is not a controversial or political issue in China, people may mainly participate in online discussions to express their views, rather than raise doubts or skepticism about the government [26]. It is a highly censored media system in China. Due to the overwhelming attention surrounding the vaccine on social media, information flow was closely censored by the Chinese government. For example, the 2018 vaccine scandal was first covered by a self-media article, which was blocked the next day [27]. Even though it was difficult to censor the deluge of criticism, "vaccine" was found to be one of the most restricted phrases on Weibo after relevant information was reported [28].

In summary, according to the results of this study, in the Chinese context, social media use and relevant information communication are positively correlated to public vaccine attitudes and conduces to increase the understanding of the vaccine and enhance the willingness to vaccinate. Moreover, the Chinese people show a highly positive attitude towards vaccine effectiveness and show low side effect concerns. Finally, although the above studies show that Chinese vaccine attitudes are correlated to social media, the correlation is not high. It is generally believed that this phenomenon is related to the Chinese government's strict epidemic prevention policy and the super high government trust of the public.

6. Limitations

This study also shows certain limitations:

I As it was an online survey, hence opinion of digitally illiterate people is underreported. The use of social media for data collection might have affected the variety of the study sample.

II Nevertheless, since the vaccination in the Chinese mainland area was mainly completed in 2021, almost all participants who were suitable for vaccination had already completed the COVID-19 vaccination during the questionnaire delivery period. Therefore, the participants did not show deep impressions on COVID-19 vaccination, and the public sentiment reflected by the questionnaire is not strong.

III In terms of social media use, because this study was only conducted from the three dimensions of social media information sources, social media trust, and social media information satisfaction, the research perspective is relatively single. Future research may adapt to target social media use, such as information communication, and online interpersonal interaction, to further explore whether different social media use will affect the audience vaccination willingness.

In addition, we believe that our results will help to effectively reflect the vaccine attitudes of Chinese regional residents and the impact of social media on their vaccination, showing regional unique results.

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