

# Mechanism of WeChat's Impact on Public Risk Perception During COVID-19

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**Purpose:** Taking COVID-19 as an example, this paper explores the mechanism of WeChat's impact on risk information transmission in social media and builds a model of WeChat's impact on public risk perception based on risk communication.

**Methods:** Research primarily utilised the questionnaire survey method to collect and analyse public attitudes towards COVID-19 to achieve the research goals. We checked the adequacy of measurements and tested the hypotheses with regression analysis based on 801 participants in China.

**Results:** The results indicated that the levels of the public WeChat COVID-19 risk information attention and trust had a significant positive impact on the public's risk perception and willingness of pandemic prevention. The improved public risk perception of COVID-19 as a mediator enhanced the public pandemic prevention ability, which allowed WeChat to play a more effective role in major disaster emergency.

**Keywords:** COVID-19, WeChat, public risk perception, pandemic prevention

## Introduction

The global outbreak of the COVID-19 pandemic in 2020 has had a huge impact on social production and life and has become a public health emergency of top international concern. During COVID-19, the perception of transmission risk had a significant psychological impact on the public and was triggered by the stimulation of the surrounding environment, the screening of pandemic information and personal experiences.<sup>1</sup> After that, the public had to shift their attitude and behaviour, making a decision to escape, change or accept the pandemic risk. With today's constant internet use, the population mainly obtains information about the pandemic through social media platforms, which have become an important tool for organisations to communicate with the public in high-risk situations.<sup>2</sup> In China, WeChat is one of the most important social media platforms with a simple interface and diverse functions. Tencent released the financial report for the first quarter of 2021 which showed the number of combined monthly live accounts of WeChat had exceeded 1.2 billion by the end of March 2021. Through the WeChat Official Accounts platform, the public can obtain the information pushed by various organisations and share content of interest with relatives, friends or colleagues, so that the information is widely and extensively spread. Therefore, in the COVID-19 period, WeChat—a social platform for acquaintances—had a very important influence on the public's risk perception.<sup>3</sup>

Based on this background, this research hopes to explore the following: the frequency and methods used to obtain pandemic risk information from WeChat; the

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varying degrees of trust across different individuals from different WeChat boards (friend chat, group chat, WeChat Moments, WeChat Official Accounts, etc); and the public's attention and trust of pandemic risk information supplied by mainstream social media. In the face of the increasing complexity and intensity of public health crisis risk level, we need to have enough space to understand and discuss the special prism used by scientists, experts and the public to observe the risk, subsequently encouraging the interaction between the two sides to achieve better risk communication.<sup>1</sup> In this context, it is particularly important to explore the mechanism of mainstream social media in pandemic risk information communication. Based on relevant empirical studies<sup>5-7</sup> and using COVID-19 as an example, this research explores social media's (WeChat) impact on the risk perception of new infectious diseases and its effect on public emergency response.

## Conceptual Framework

### Risk and Disaster Perception

Risk perception refers to the public's perceptions, attitudes and judgments of risk, highlighting their cultural values and risk tendencies. This concept originated from the study of cognitive psychology, theorising that the public will use some heuristic psychological strategies to understand the uncertainty of an event.<sup>8</sup> Disaster risk refers to the possibility of a disaster and its actual or expected consequences. Disaster risk management refers to society adjusting existing resources to avoid or reduce various losses that may be caused by disasters.<sup>9</sup>

In such a situation, risk perception plays a key role. Risk perception affects the public's response to disasters. For example, some people made immigration decisions due to higher risk perceptions.<sup>10</sup> Increasing the public's perception of disaster risk can make them more proactive in disaster preparedness.<sup>11</sup> In addition, the risk perception of local residents was also an indicator to measure the degree of public support for adaptation planning.<sup>12</sup>

The public's perception of risks and disasters is affected by many factors. Some studies believed that risk perception, as the basis of crowd behaviour decision-making and risk judgment, was affected by emotional factors, risk target factors, cultural factors, personal psychological characteristics, and personality differences.<sup>13</sup> Some researches proposed that risk perception can be measured by the four elements of fear, attitude, awareness, and trust, and others concluded that local and religious

beliefs are also important factors that affect local residents' perception of flood disasters.<sup>14,15</sup> Residents' perception of disaster risk also had a significant correlation with the place of residence.<sup>9</sup> In a study of Ebola risk perception, respondents' judgments were generally consistent with scientific knowledge and with their self-reported behavioural responses and policy preferences.<sup>16</sup> During COVID-19, some studies have found that cultural publicity, regional differences and social media all affect risk perception, which has an impact on pandemic prevention behaviour.<sup>5-7</sup>

## Application of Social Media in Disaster Management

In recent years, risk communication as an important tool to influence and change public risk perception and risk response behaviour has received extensive attention from scholars and practitioners, and communication channels are important parameters of risk communication.<sup>17</sup> When disaster strikes, the public can instantly obtain risk-related information through various communication channels. Social media has become a platform to deliver emergency-related information with its huge number of accounts, extensive information coverage, rapid transmission and various forms of communication. The influence of social media cannot be underestimated.<sup>18</sup> When individual information, professional knowledge, skills and other resources are introduced into social media, they will also be externalised, organised and integrated to form a power multiplier that enables the public to independently participate in disaster emergency management.<sup>18</sup> The use of social media can not only cultivate trust through shared narrative and collective understanding but also improve mutual trust through the role of a reliable information provider by local governments.<sup>19</sup>

## Social Media Affects Public Disaster Perception and Response

In the process of risk perception, the media has the functions of reporting, elaborating, attributing and constructing a picture of mergers and acquisitions. It is one of the important information channels for individuals to recognise and judge risks.<sup>20</sup> Some research pointed out that social media was related to fear and anger, and these emotions affect the relationship between social media and personal risk perception and behaviour.<sup>21</sup> Individuals with enough disaster experience can immediately

understand the disaster situation and can view the communication content of the media theoretically and critically, while those with limited disaster experience rely more on the media content to help build their awareness of disaster, which can magnify their risk perception.<sup>20</sup>

In summary, social media has now become an important means of public interpersonal communication and information acquisition. Research on disaster risk management in the context of social media has received extensive attention from many researchers. As an important information dissemination channel, existing research mainly discusses the impact of social media on the public's risk perception and willingness to prevent and control the pandemic, but the specific impact path and the relationship between the three have not been studied in depth. This research will subsequently focus on filling this vacancy, using WeChat as an example to analyse and verify these issues.

## Model Development and Hypotheses

### Construct Design

This research introduces four main variables: public WeChat attention to COVID-19 risk information; public

WeChat trust of COVID-19 risk information; public risk perception; and public willingness to prevent pandemic risk. These variables are introduced and explained below, and the specific items are shown in Table 1.

Public WeChat attention to COVID-19 risk information (WeChat Attention) reflects the public's attention to COVID-19 risk that is closely related to them. The public's curiosity increases their attention and prompts further exchanges of information. This study primarily includes the channels through which the public can read pandemic-related information, the frequency and duration of reading pandemic-related information, the demand for disaster-related information, and the use of corresponding disaster relief functions. In order to facilitate statistical analysis, this study uses the frequency and spend-time of the public to view the pandemic information as a measure of the WeChat attention to COVID-19 risk information.

Public WeChat trust of COVID-19 risk information (WeChat Trust) reflects the public's degree of trust in the disaster information that they contact or read. This study explores the public's trust in the pandemic information from various functions of WeChat, and the influencing factors of trust. This research requires respondents to score the trust of WeChat functions, and finally calculates

**Table 1** Variable Item Description

Variable	Item Description
Public WeChat attention to COVID-19 risk information (WeChat Attention)	Q1:How often do you get pandemic information through WeChat every day?
	Q2:How long do you spend reading the pandemic information from WeChat every day?
Public WeChat trust of COVID-19 risk information (WeChat Trust)	Q1:How reliable do you think the information from the WeChat Official Accounts is?
	Q2:What do you think of the reliability of getting pandemic information from WeChat mini programs?
	Q3:What do you think of the reliability of obtaining pandemic information from WeChat search function?
Public risk perception (Risk Perception)	Q1:How much do you think COVID-19 has impacted society?
	Q2:What do you think is the threat of COVID-19 to your life and health?
	Q3:What do you think is the negative impact of COVID-19 on your life and your family's lives?
	Q4:How has COVID-19 impacted your work or study with your family?
Public willingness to prevent pandemic risk (Prevention Willingness)	Q1:If necessary, would you like to participate in the pandemic prevention as a volunteer?
	Q2:If necessary, would you like to donate to a COVID-19-affected area?

the overall trust of WeChat disaster information based on the average trust ratings of WeChat Official Account, WeChat mini program, and WeChat search function.

Public risk perception (Risk Perception) refers to the public's perception of the impact of disasters after reading WeChat disaster information. The research questions are designed from the perspectives of society, personal health, family work, and family health, and are analysed using the five points Likert scale. Finally, the average perception of the four sides is used to express the public perception of the COVID-19 risk.

Public willingness to prevent pandemic risk (Prevention Willingness) expresses the public's commitment to avoid the spread of COVID-19 after understanding the risk situation. This includes a willingness to participate in pandemic prevention and disaster relief as a volunteer and donate money and materials to COVID-19-affected areas.

## Research Model and Hypotheses

Based on the research detecting the mechanism of WeChat's influence on public COVID-19 risk perception and emergency response willingness in the context of disaster situations, two main independent variables (Public WeChat attention to COVID-19 risk information and Public WeChat trust of COVID-19 risk information) are designed. Public risk perception is regarded as a mediating variable, and the dependent variable (Public willingness to prevent pandemic risk) is used in research model. The research model is shown in Figure 1.

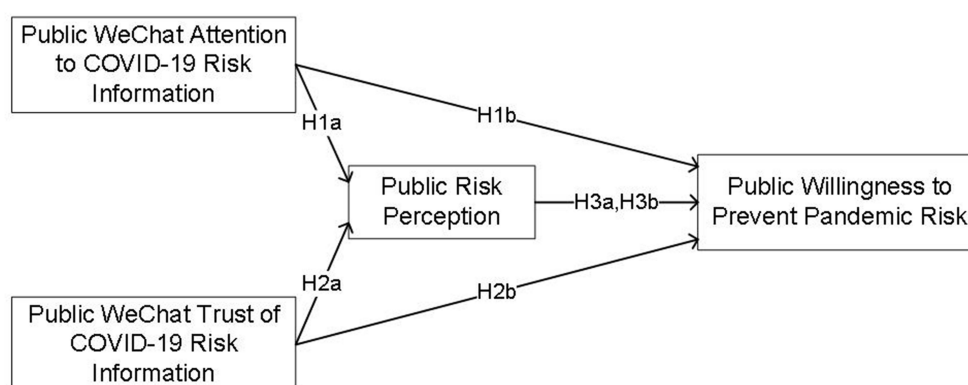
During COVID-19, various risk information was quickly and efficiently disseminated and spread across social media. The government or organisation hopes to guide or influence the public's attitude and behaviour by

publishing information on social media, while the public hopes to receive and exchange external information through social media platforms to make more effective decisions. In the complex risk communication process of such multiple interactions, it is necessary to discuss the public's preference, attention content, and trust in disaster content on social media, and how these factors affect the public's psychological changes, disaster awareness and willingness to act. This allows the government or organisation to better grasp the social media disaster information release strategy, thereby achieving more scientific and effective disaster risk management. Agenda setting theory and acculturation theory are important theoretical foundations for social media's influence on public perception of disaster emotions; agenda setting theory focuses on the effect of media on public perception, while acculturation theory focuses on the influence of media on public attitudes and values.<sup>22</sup> For example, social media as a promoter of cultural change affects the audience's culture and consumption philosophy.<sup>23</sup> In general, the two theories show that people who spend more time on social media and devote more trust to platforms are more inclined to view the world with the values presented by the media, and will also produce stronger cognitive changes and a willingness to act. Based on this, the following assumptions are proposed:

H1a: Public WeChat attention to COVID-19 risk information has a positive impact on their risk perception.

H1b: Public WeChat attention to COVID-19 risk information has positively affected their willingness to prevent pandemic risk.

H2a: Public WeChat trust of COVID-19 risk information has a positive impact on their risk perception.



**Figure 1** Research model Note: H1a, H2a, etc. represent different assumptions in the model.

H2b: Public WeChat trust of COVID-19 risk information has positively affected their willingness to prevent pandemic risk.

Under the stimulation of media information, the perception of the public as a psychological behaviour will also have an important impact on the public's behavioural decision-making. In this influencing process, perception can be used as an intermediary. It is not only an important result of the public receiving media information but also an important factor that affects the public's willingness to act. Therefore, based on the assumption that public WeChat attention and trust of COVID-19 risk information affects their willingness to prevent pandemic risk, the internal mechanism of this relationship is explored by increasing the mediating variable of public risk perception. In the process of analysing the mediating effect of public risk perception, the original research on disaster response can be linked together to make the existing theories more systematic, which has theoretical and practical significance. Based on this, this research further proposes the following hypotheses:

H3a: In the process where public WeChat attention to COVID-19 risk information influences their willingness to prevent pandemic risk, risk perception has a mediating effect.

H3b: In the process where public WeChat trust of COVID-19 risk information influences their willingness to prevent the pandemic, risk perception has a mediating effect.

## Empirical Analysis

### Questionnaire Survey Process

This research mainly used the questionnaire survey method to collect and analyse the public attitudes towards disasters to complete the research goals. Questionnaire survey research was divided into two stages. Due to the impact of pandemic control measures, online surveys were relatively safe, and data collection was not restricted by geographical conditions, so it was the main method. After the pandemic situation was controlled, combined with the online questionnaire survey results, the number and collection of questionnaires of different characteristics of the population were counted. These questionnaires were then distributed to the target population with less collection online and offline to improve the existing data, thereby enhancing the quality of the questionnaire survey. Among them, the online questionnaire mainly used the WeChat

platform to send links to respondents from the social networks of surveyors, such as friends, relatives and alumni circles.

In the first stage, the online questionnaire was distributed from 4 April 2020 to 15 April 2020, and a total of 822 questionnaires were collected. Judging from the collection of online questionnaires, most of the interviewees submitted questionnaires (66.45%) through the WeChat platform, which was consistent with the original intention of the questionnaire platform. The geographical location of the interviewees was widely distributed, covering many different provincial administrative regions. After manual screening, the unqualified questionnaires that selected the same options for the scale data were eliminated and a total of 742 valid questionnaires were obtained. The questionnaire pass rate was 90.27%. In the second stage, we collected 59 valid questionnaires. Therefore, the total sample size of this study is 801, and the basic situation of the sample is shown in Table 2. Nearly half of the interviewees have a high degree of education.

### Reliability Test and Validity Test

To ensure the consistency, stability and reliability of the questionnaire items, it is essential to check the reliability of the data. In this study, as shown in Table 3, Cronbach's alpha of all variables was higher than 0.6, indicating that the overall reliability of the scale was good, and the internal consistency of the variables of the questionnaire was

**Table 2** Descriptive Statistics of Sample Characteristics (n=801)

Demographic Factors	Classification	Proportion
Sex	Male	43.8%
	Female	56.2%
Age	<19	20.6%
	19~35	41.6%
	36~59	34.2%
	>60	3.6%
Education	Junior high school and below	44.9%
	Senior high school	12.5%
	University	31.7%
	Graduate and above	10.9%
Occupation	Government/institution staff	8.7%
	Student	40.1%
	Workers of enterprise	27.3%
	Other	23.9%



**Table 3** Reliability and Validity of the Questionnaire

Variable	Question	Factor Load Coefficient					Cronbach's Alpha
WeChat Attention	Q1	0.071	0.047	0.085	0.085	<b>0.845</b>	0.646
	Q2	0.084	0.107	0.005	0.035	<b>0.850</b>	
WeChat Trust	Q1	0.227	0.058	<b>0.803</b>	0.123	-0.011	0.791
	Q2	0.146	-0.017	<b>0.829</b>	-0.018	0.031	
	Q3	0.82	0.037	<b>0.833</b>	0.074	0.085	
Risk Perception	Q1	0.106	<b>0.572</b>	-0.001	0.439	-0.020	0.783
	Q2	0.113	<b>0.760</b>	0.087	-0.020	0.157	
	Q3	0.188	<b>0.836</b>	-0.030	0.064	0.057	
	Q4	0.094	<b>0.817</b>	0.026	0.163	0.001	
Prevention Willingness	Q1	0.036	0.102	0.077	<b>0.872</b>	0.058	0.793
	Q2	0.044	0.145	0.085	<b>0.880</b>	0.081	

**Note:** Bold letters indicate the corresponding relationship between each question and the variable.

relatively high, which could be used as a basis for data analysis for further research.

Validity analysis can reflect the accuracy of the data, the accuracy and usefulness of the performance test. In this study, the KMO value was 0.795, and the Bartley sphere test reached the level of significance. The principal component analysis method was used to extract common factors using scale items, and the factor rotation was carried out by Caesar's normalised maximum variance method. The rotation component matrix corresponding to the final variables is shown in Table 3.

## Statistical Analysis Results

### Public Access to Risk Information

In order to understand the chief methods for the public to obtain disaster information in disaster situations, the research asked the respondents to choose several approaches to track the progress of the pandemic. The results are shown in Table 4. From the overall ranking, when searching for pandemic related information, the public is most inclined to use WeChat for information

searches, accounting for 68.54%, which proves the importance of WeChat in social life and information dissemination. This is followed by television and radio which accounts for 63.3%, indicating that traditional media television and radio are still one of the important avenues to obtain information. In addition, short video apps, news and information apps, and microblogs are also important channels for the public to obtain disaster information, accounting for 46.44%, 41.07% and 28.8% respectively. Only 4.62% of the respondents chose paper media such as newspapers, and 3.75% chose other ways, such as oral notification from relatives and friends. Therefore, compared with traditional media, social media is the most popular platform to obtain disaster information. Although WeChat ranks first in all age groups, middle-aged and elderly people prefer WeChat more than other platforms, and it is the main source of news and information apps over traditional media. Young people use short video apps more frequently, and the main users of microblogs are between the ages of 19 and 35.

**Table 4** Number and Proportion of Main Ways for the Public to Obtain Risk Information (%)

Main Approaches	Total	Under 19 Years	19~35 Years	36~59 Years	Over 60 Years	Rank
WeChat	549 (68.54)	106 (64.24)	219 (65.77)	202 (73.72)	22 (75.86)	1
Television and radio	507 (63.3)	103 (62.42)	195 (58.56)	187 (68.25)	14 (48.28)	2
TikTok, short video, etc.	372 (46.44)	89 (53.94)	135 (40.54)	134 (48.91)	14 (48.28)	3
News and information Apps	329 (41.07)	69 (41.82)	126 (37.84)	124 (45.26)	10 (34.48)	4
Weibo	225 (28.09)	34 (20.61)	169 (50.75)	20 (7.30)	2 (6.90)	5
Newspapers and other paper medias	37 (4.62)	9 (5.45)	9 (2.70)	14 (5.11)	5 (17.24)	6
Others	30 (3.75)	8 (4.85)	10 (3.00)	12 (4.38)	0 (0.00)	7

## Access Ways of COVID-19 Risk from WeChat

### 1. WeChat channels for the public to learn about COVID-19 risk information

The scale of WeChat attention ranged from 1 (less attention) to 5 (most attention). From an overall point of view, as shown in Table 5, the public pays more attention to WeChat disaster information (mean=4.04).

When the public uses WeChat to obtain pandemic-related information, they mainly use the following functions: WeChat Official Accounts and Moments, which account for 56.93% and 56.05% respectively; WeChat group chats and friend chats, which accounts for 43.95% and 41.32% respectively; and the WeChat mini program and WeChat search function, which only accounts for 12.98% and 10.24%. The results are shown in Figure 2.

For a variety of pandemic information, these statistics demonstrate the following: the public pays the highest attention to the dynamic update of the pandemic (80.27%); the attention to the pandemic prevention science content, pandemic prevention policies, and information and stories related to medical staff in the pandemic is average (53.81%, 47.57% and 44.07% respectively); and the disinformation during the pandemic and the stories related to patients in the pandemic are less concerned (17.98%, 18.35%, respectively).

### 1. Analysis of the public's trust in WeChat disaster information

The study also explored the public WeChat trust of COVID-19 risk information obtained from different functions of WeChat (such as friend chat, group chat, WeChat Moments, WeChat Official Accounts, etc.). The scale of WeChat trust ranged from 1 (less trust) to 5 (most trust). The results show that overall, the public WeChat trust of COVID-19 risk information is 3.41 (SD=0.67), which is at a moderately high level. For different functions, the public

has the highest trust in WeChat Official Account (mean=3.79) and the lowest trust level in WeChat group chat (mean=3.11).

In order to discuss the influencing factors that cause the public to have differences in the trust of WeChat disaster information, the research requires the respondents to select the corresponding degree of influence for the listed possible factors. The specific possible influencing factors are: information is reprinted or forwarded by high frequency; the professionalism of the information; the fairness of the information; the validity of the information source; and one's intuition or experience. The results show that the public has a high degree of trust in information with reliable sources of information (mean=3.70), impartiality (mean=3.67), and professionalism (mean=3.59), while the received information is frequently forwarded (mean=3.22), and one's own experience or intuition (mean = 3.22) has less influence.

From the data in Table 5, it can be noted that after browsing the WeChat COVID-19 risk information, the public risk perception is at a moderately high level (mean=3.79). The willingness to prevent pandemic risk is also at a high level (mean=4.25).

## Regression Analysis Results

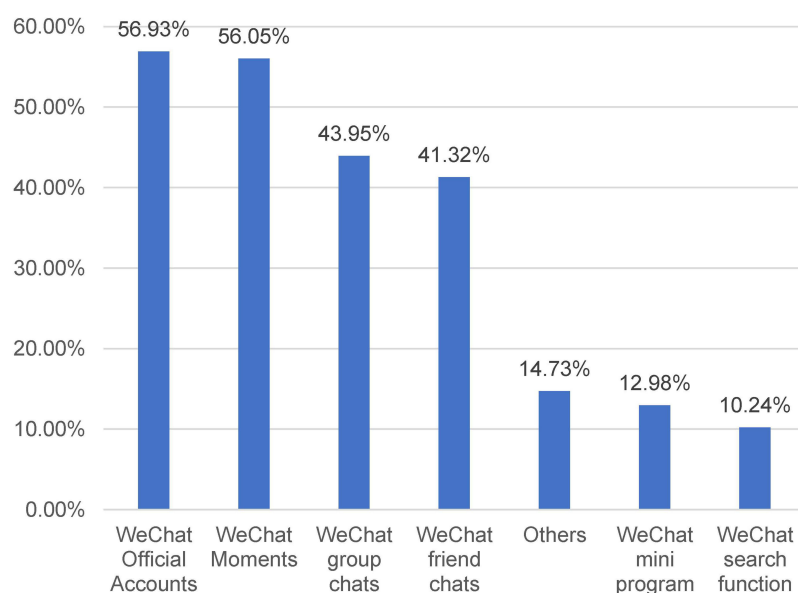
The public WeChat attention and trust of COVID-19 risk information were used as independent variables, and demographic factors were used as control variables. The public risk perception and prevention willingness after reading WeChat COVID-19 risk information were taken as dependent variables. After standardised processing of each variable, a multiple linear regression model was used to analyse the hypothesis to verify the research model.

The multiple linear regression model is shown in Table 6. It could be concluded that in general, the public WeChat attention to COVID-19 risk information had a significant positive effect on the risk perception ( $\beta=0.153$ ,  $p<0.001$ ), and a significant positive impact on public willingness to prevent pandemic risk ( $\beta=0.112$ ,  $p<0.01$ ). Furthermore, the public WeChat trust of COVID-19 risk information had a very significant, positive impact on the public willingness to prevent pandemic risk ( $\beta=0.161$ ,  $p<0.001$ ). And because the research is exploratory, the public WeChat trust of COVID-19 risk information had a significant impact on the edge of risk perception ( $\beta=0.080$ ,  $p<0.05$ ), which could also explain the hypothesis to a certain extent. Therefore, the higher the public WeChat attention and trust of the risk information, the stronger their

**Table 5** Variable Statistics and Pearson's Correlation Matrix

Variable	Mean	SD	1	2	3
1 WeChat Attention	4.04	1.43	1		
2 WeChat Trust	3.41	0.67	0.116**	1	
3 Risk Perception	3.79	0.81	0.185**	0.102**	1
4 Prevention Willingness	4.25	0.82	0.148**	0.169**	0.321**

**Notes:** Standard errors in parentheses. \* $p < 0.05$ ; \*\* $p < 0.01$ .



**Figure 2** Public use of WeChat functions.

perception of the COVID-19 risk, that is, they would make a more pessimistic estimation of the possible negative impact of the pandemic and have a stronger willingness to prevent it. As such, the public WeChat attention and trust of COVID-19 risk information had a positive impact on the public risk perception and willingness to prevent pandemic risk. The hypotheses H1a, H1b, H2a, H2b were held.

### The Mediating Effect Test of Public Risk Perception

First, the research verified the mediating effect of the public WeChat attention to COVID-19 risk information, public risk perception and public prevention willingness. As shown in Table 7, the research observed the significance of the regression coefficients of each model. In the model with WeChat attention as the independent variable and public pandemic

prevention willingness as the dependent variable, the regression coefficient ( $\beta=0.131$ ,  $p<0.001$ ) was significant at 0.001 level. We continued to test the regression coefficients ( $\beta=0.163$ ,  $p<0.001$ ) with WeChat attention as the independent variable and risk perception as the dependent variable, and then verified the regression coefficient ( $\beta=0.293$ ,  $p<0.001$ ) of the mediate variables in the model with WeChat attention as the independent variable, risk perception as the mediate variable, and prevention willingness as the dependent variable. The regression coefficients were significant at the level of 0.001. Finally, we tested the regression coefficient ( $\beta=0.084$ ,  $p<0.05$ ) of the independent variables in the model with WeChat attention as the independent variable, public risk perception as the mediate variable, and public prevention willingness as the dependent variable, which was significant at 0.05 level. Based on the classic mediating effect method, it shows that the risk perception was a partial mediating effect. In the process of public WeChat attention to COVID-19 risk information influencing the public willingness to prevent pandemic risk, part of it was achieved by influencing the public risk perception, while WeChat attention directly impacted the prevention willingness.

Next, we verified the mediating effect of public risk perception in the relationship between public WeChat trust of COVID-19 risk information and public willingness to prevent pandemic risk. Similarly, we analysed the significance of the regression coefficients, and it is found that public risk perception had a partial mediating effect in the

**Table 6** Summary of Multiple Linear Regression Models

Dependent Variable \ Independent Variable	Risk Perception	Prevention Willingness
Sex	-0.022	0.032
Age	0.065	0.101
Education	-0.070	0.009
Occupation	0.075	0.062
Wechat Attention	0.153***	0.112**
WeChat Trust	0.080*	0.161***
R <sup>2</sup>	0.061	0.067
F	8.592***	9.548***

**Notes:** Standard errors in parentheses. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .



**Table 7** Test Model of Mediating Effect

Dependent Variable Independent Variable	Prevention Willingness	Risk Perception	Prevention Willingness	Prevention Willingness	Risk Perception	Prevention Willingness
Sex	0.035	-0.021	0.041	0.021	-0.037	0.032
Age	0.100*	0.065	0.081	0.106*	0.072	0.085
Education	-0.012	-0.081*	0.011	0.007	-0.072	0.028
Occupation	0.052	0.070	0.031	0.079	0.097*	0.050
WeChat Attention	<b>0.131***</b>	<b>0.163***</b>	<b>0.084*</b>	—	—	—
WeChat Trust	—	—	—	<b>0.174***</b>	<b>0.098**</b>	<b>-0.145***</b>
Risk Perception	—	—	<b>0.293***</b>	—	—	<b>0.292***</b>
R <sup>2</sup>	0.042	0.055	0.123	0.055	0.039	0.137
F	7.029***	9.224***	18.634***	9.334***	6.396***	18.324***

**Notes:** Standard errors in parentheses. \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001. Bold letters indicated the parameters to be valid ated.

process of public WeChat trust of COVID-19 risk information affecting public willingness to prevent pandemic risk. Therefore, hypotheses H3a and H3b held.

Here, we analyse the reasons and value of the mediating effect of public risk perception. After the public contacted or read the WeChat risk information, they had a more detailed understanding and judgment of the risk situation and threat level of their environment and generated some negative emotions and willingness for risk relief operations. These perceptions and emotions have made the public feel more compassionate towards their peers in hard-hit areas or difficult environments, and under the influence of mainstream values, they believe that they have a responsibility to contribute to disaster relief. Therefore, public risk perception as an intermediary link more closely connects the public WeChat attention and trust of COVID-19 risk information with the public willingness to prevent pandemic risk. This connection strengthens the public's willingness to prevent pandemic risk.

## Conclusion and Inspiration

COVID-19 shows that in the face of a sudden global health crisis, social media plays an important role in the prevention process. Different from the relevant empirical research, where only the use, area and frequency of social media are counted and analysed,<sup>5</sup> we explored the specific path of social media in impacting public risk perception and prevention willingness. The public WeChat attention to risk information is at a relatively high level, illuminating the public's high degree of new health-related infectious diseases attention. The public WeChat trust of risk

information is at a medium-to-high level, showing that even though WeChat is the most important online social platform, there are still some differences in the trust of people from different backgrounds.

The main research results of this paper show that in disaster situations such as COVID-19, the public's attention and trust in risk information in WeChat have a positive impact on the public risk perception and prevention willingness. Moreover, in the process that the public WeChat attention and trust impacted the public's willingness of pandemic prevention, the risk perception has a partial mediating effect. H1a, H1b, H2a, H2b, H3a, and H3b are all supported. This demonstrates that the public's WeChat attention and trust of COVID-19 risk information are important factors that influence public risk perception. In the new pandemic, in addition to factors such as people's cultural backgrounds, environments, disaster experiences, and religious beliefs, the higher the public's energy and trust in the risk information in WeChat, and the more information that will be generated. A more precise level of risk perception will result in a higher level of "empathy" for the COVID-19 period. This will greatly affect the public's willingness to participate in risk response such as pandemic prevention, thereby creating conditions and opportunities for public mobilisation of public health emergencies.

Secondly, the research discovers a part of the mediating effect of public risk perception. The global anti-pandemic practice of the novel Coronavirus at this stage shows that promoting the public to actively participate in the prevention of new infectious diseases, to actively protect themselves, and to actively respond to lockdown

policies such as social distancing is critical to the prevention and suppression of the pandemic. Whether the public can successfully participate in the pandemic prevention depends on helping the public realise sufficient risk perception, which also proves the importance of risk communication of related risk for the emergency management of major disasters.

Finally, in the COVID-19 period, in addition to improving national identity and leadership and controlling cultural determinants,<sup>6,24</sup> further exerting the active role of WeChat in the prevention of major disasters such as COVID-19 will become an effective means of emergency management. The government or disaster prevention, mitigation and disaster relief social organisations can open WeChat Official Accounts to disclose risk information, thereby enhancing the public's risk perception; they can cooperate with Tencent to release the official risk warning information and risk prevention and relief science knowledge in the circle of friends to enhance the public's risk perception and scientific responses to disasters. Specifically, the following measures can be taken: the government can use WeChat Moments to carry out pandemic prevention knowledge education and improve public risk perception, make use of community WeChat group chat for effective risk communication and improve the ability of risk early warning and joint prevention. They can also use WeChat mini programs to submit information and improve the accurate prevention ability supported by big data. In the future, we will continue to explore the impact of social media on public risk perception, emergency preparedness and disaster relief response, and quantify these impacts to summarise more application methods of social media in emergency management.

## Data Sharing Statement

The data of this study are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

This study was conducted following the principles of Helsinki declarations. The study was an independent investigation and approved by the School of Safety Science and Emergency Management, Wuhan University of Technology. Each participant was informed about the purpose of the study, its benefits, and confidentiality and consent was obtained from every participant in the surveys prior to their inclusion in the study (eligible individuals

who were under the age of 18 were required to obtain the consent of their guardians). The collected data were kept in a secure way to prevent unauthorised access.

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## Disclosure

The authors report no conflicts of interest in this work.

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