

Original Research

Cite this article: Guo Y, Xiang H and Hou Y (2024). Coping with Unknown Health Crisis via Social Media: A Content Analysis of Online Mutual Aid Group in the Beginning of the COVID-19 Pandemic. *Disaster Medicine and Public Health Preparedness*, **18**, e211, 1–8 <https://doi.org/10.1017/dmp.2024.278>

Received: 08 August 2023

Revised: 17 December 2023

Accepted: 10 September 2024

Keywords:

COVID-19; social media; social support; self-disclosure; information completeness

Corresponding author:

Hongzhe Xiang;

Email: fitfulgteam@outlook.com

Coping with Unknown Health Crisis via Social Media: A Content Analysis of Online Mutual Aid Group in the Beginning of the COVID-19 Pandemic

Yu Guo, Hongzhe Xiang  and Yongkang Hou

Faculty of Humanities and Arts, Macau University of Science and Technology, Macau SAR, China

Abstract

Objective: The initial emergence of SARS-CoV-2 created uncertainty for humanity, driving people to seek assistance on social media. This study aims to understand the role of social media in coping with crises and to offer guidance for future uncertainties by examining the experiences of Wuhan during the early stages of the pandemic.

Methods: Using quantitative content analysis, this study investigated 2207 Weibo posts tagged with “COVID-19 Mutual Aid” from individuals located in Wuhan during the early lockdown period from January 23, 2020, to March 23, 2020.

Results: At the start of pandemic, messages seeking tangible support were most common. A hurdle regression model showed that deeper self-disclosure led to more retransmission of help-seeking messages. The Chi-Square and Mann-Whitney U tests revealed that health professionals and laypeople had different self-disclosure strategies.

Conclusions: This study provides insight into the online social support exchange during the early stages of the COVID-19 pandemic in Wuhan, highlighting the importance of self-disclosure on message retransmission, and the differences in self-disclosure strategies between health professionals and laypeople in online help-seeking.

Public health emergencies often expose humanity to uncertainty, fear, and chaos.¹ Frustratingly, society is increasingly confronted with potential threats posed by emerging “diseases X.”² It is difficult to anticipate the challenges and responses of the next public health crisis. FeldmanHall and Shenhav³ suggest that learning from past experiences is a key strategy to cope with uncertainty. Therefore, drawing lessons from the past is essential for navigating future uncertainties related to public health crises.

The early responses to COVID-19 from the people of Wuhan, China, serve as an important case study in this regard. Wuhan was the first city in the world to encounter and suffer from the attack of the SARS-CoV-2 virus.⁴ At the beginning of 2020, the virus was a mystery to the Wuhan people. They had limited knowledge about its pathogenesis, transmission, and associated health consequences after infection.^{5–8} This information uncertainty sparked widespread panic. Besides, Wuhan was also the pioneer in executing a large-scale lockdown, a move abrupt and unrivaled in its scale.⁹ This intervention disrupted people’s daily lives significantly.¹⁰ Consequently, unprepared individuals confronted panic due to supply deficit¹¹ and severe psychological stress.¹² Nonetheless, Wuhan people did not remain passive during the crisis. They undertook substantial self-help efforts via social media. This is manifested in a great number of messages containing social support exchanges on Weibo. These data could be invaluable in providing guidance and instructions to individuals in the evolving uncertainties.^{13,14}

Given this, the present study aims to reexamine the onset of the COVID-19 outbreak in Wuhan, investigating people’s needs, their awareness of the disease, the strategies they used to gain attention, and the differential behaviors demonstrated by professionals and laypeople. We hope our findings will offer valuable insights that will guide society in managing future public health emergencies.

The Current Study

The unprecedented lockdown in Wuhan significantly impacted people’s ability to connect with others,¹⁵ creating a strong demand for online social support exchanges.¹⁶ In response to the unfamiliar public health crisis, a vast online group spontaneously formed on Weibo, utilizing the specific topic tag “COVID-19 Mutual Aid” (#新冠肺炎互助). Given the novel and challenging

situation in Wuhan and the strict lockdown policy, it is essential to understand the context of social support behaviors at the early stage of the pandemic, especially of those infected with COVID-19. Therefore, we propose the following research question:

RQ1: During the early stage of the COVID-19 pandemic in Wuhan, what are the (a) number and (b) proportion of social support messages in the COVID-19 Mutual Aid Weibo Group? Which (c) orientation and (d) type of social support messages is more/the most prevalent?

Additionally, social support exchange behavior often involves self-disclosure, which is seen as an important strategy for obtaining social support.¹⁷ Self-disclosure can help individuals build trust in interpersonal communication.¹⁸ However, the richness of self-disclosure can affect the completeness of information that the audience receives. In online mutual helping, information completeness is an essential component of content credibility.¹⁹ It refers to the richness and clarity of information provided by an individual.²⁰ Because completeness and credibility are strongly related, completeness affects people's perception of the quality of online information.²¹ As people increasingly rely on online information for decision-making,²² information completeness naturally becomes one of the most critical criteria in choice-making and action-taking.^{23,24}

During the Wuhan lockdown, both the depth of self-disclosure and the richness of social support types in help-seeking posts were used as strategies to attract social concerns and were displayed on social media platforms as retransmissions (specifically, the number of reposts).^{19,25,26} Retransmission was vital during the early stage of the COVID-19 pandemic, not only because it was considered a measure of communication effectiveness.²⁷⁻²⁹ More significantly, wide reposting equaled more opportunities for help-seekers to receive support, which would help authorities better understand the people's needs and address potential resource shortages and other urgent issues.

Regarding Wuhan people's online self-disclosures during the early stage of the COVID-19 pandemic, we found that they tried to use their words to describe the clinical manifestations of COVID-19 (e.g., fever, cough, dyspnea, fatigue, diarrhea, and vomiting)³⁰ and to evaluate their disease statuses online. The more complete symptoms people disclose (the more severe the illness), the more social concerns or support they might receive.^{19,31} Thus, we propose our first hypothesis:

H1: The completeness of self-disclosure about symptoms (disease statuses) in the COVID-19 Mutual Aid posts is positively associated with retransmission.

In addition to self-disclosure about symptoms, the description of chest CT results in the COVID-19 Help-Seeking posts also caught our attention because chest CT results were used to diagnose COVID-19 in the early pandemic in Wuhan.^{32,33} Thus, we raise another hypothesis:

H2: The self-disclosure of chest CT results in the COVID-19 Mutual Aid posts is positively associated with retransmission.

Furthermore, we observed that during the early stages of the COVID-19 pandemic, the Wuhan people did not limit

themselves to seeking a singular form of social support. Instead, they actively sought multiple forms of support at the same time. This trend was also observed in the provision of social support. In other words, a single message could contain various types of social support.³⁴ According to the social support theory, the completeness of the types of social support sought or offered is directly linked to an individual's personal situation.³⁵ The more diverse the social support an individual seeks, the more difficult their situation likely is. Similarly, the completeness of the types of social support offered reflects one's good situation and ability to help others. Based on these findings, we speculate that the completeness of the types of social support sought or offered will result in more reposts. Therefore, we posit the following hypotheses:

H3: The completeness of the types of seeking social support in the COVID-19 Mutual Aid posts is positively associated with retransmission.

H4: The completeness of the types of offering social support in the COVID-19 Mutual Aid posts is positively associated with retransmission.

In terms of the recognition and handling of COVID-19, there may be a difference between health professionals and the general public.³⁶ Previous studies have shown that health professionals have expertise in understanding and managing illnesses,³⁷⁻³⁹ while the gap between health professionals and laypeople indicates a lack of knowledge.⁴⁰ This gap in knowledge may lead to subjective and emotional perceptions and behaviors among laypeople, while professionals are seen as objective and reliable.^{5, 40, 41} However, in the early stages of the pandemic, the knowledge gap may have been small between health professionals and the laypeople, as COVID-19 was a new and unfamiliar disease for everyone in Wuhan at that time. Moreover, it is unclear whether this divergence in knowledge is reflected in different types of self-disclosure. Therefore, the following research questions are proposed:

RQ2: Is there any significant difference between laypeople and health professionals in disclosing the completeness of symptoms (disease statuses)?

RQ3: Is there any significant difference between laypeople and health professionals in disclosing chest CT results?

Methods

Data Collection

With the help of web crawlers, this study employed quantitative content analysis to examine posts tagged with "COVID-19 Mutual Aid" (#新冠肺炎互助) on Weibo, one of China's most popular social media platforms, during the initial phase of the pandemic. The analysis period spanned from January 23, 2020, the date of Wuhan's lockdown, to March 23, 2020. Our selection criteria included posts from individuals who self-reported as being (or likely being) infected with COVID-19, and we further refined our dataset by excluding geotags outside of Wuhan. The data was retrieved on January 11, 2022. Ultimately, we gathered 2207 valid samples for coding and subsequent analysis.

Table 1. Definitions and examples of different social support messages

Type of social support	Definition	Orientation	Example
Informational support	Posts that guide people cope with difficulties or provide people with advice, news, findings.	Seeking	"I suspect myself been infected with the coronavirus. Can anybody tell me what the symptoms are during the incubation period?"
		Offering	"Good news! CT check is available at Puai Hospital!"
Emotional support	Posts that show empathy, understanding, encouragement, or other supportive emotions.	Seeking	"I've got a high fever. I'm so scared. Will I die at home alone?"
		Offering	"Please be optimistic! You're the best! We'll win this war!"
Tangible support	Information that brings resources, materials, or physical actions.	Seeking	"We've nearly run out of our PPE, and I can't go out alone as I must take care of my grandpa at home. Is there any spare PPE that could send to my address?"
		Offering	"Our hotel can provide several vacant rooms for quarantine."
Network support	Posts that express a willingness to connect with similar others or involve in a social community.	Seeking	"I was just diagnosed with COVID-19. Is there anyone who also infected can talk to me?"
		Offering	"I created a group chat on WeChat, and I invited some health care workers and volunteers to join in. If you feel helpless, please do not hesitate to contact me with a private message. P.S. only for Wuhan people."
Esteem support	Posts that validate someone's values, personalities, behaviors, or other personal characteristics.	Seeking	N/A
		Offering	"You are all heroes staying at home, Wuhan people!"

Note: Seeking esteem support was not found in our coding procedures.

Coding Procedures and Operationalization of Variables

Social support

In accordance with the classification suggested by Cutrona and Suhr,⁴² Table 1 presents definitions and examples of social support exchange types (esteem support seeking was not identified in our coding procedures). All items were coded as 1 if mentioned and 0 if not mentioned in the selected posts.

The completeness of seeking/offering social support types

Considering that residents of Wuhan rarely sought or provided a single type of social support, we introduced two new variables: the completeness of sought social support types and the completeness of offered social support types. These variables, ranging from 0 to 5, were employed to evaluate their personal circumstances. Each time a type of social support (informational, emotional, tangible, network, or esteem) was referenced in a post, a point was added to the corresponding completeness score.

The completeness of self-disclosure about symptoms

Given the limited understanding of COVID-19 among individuals during the Wuhan lockdown, there were no specific standards for describing the clinical manifestations of the disease at the onset of the pandemic. This was evident in our pilot coding process, where individuals described their symptoms in various ways.

Subsequently, we referred to the clinical characteristics of COVID-19, as later described by Zhu et al.,³⁰ and our observations from the pilot coding. From this, we identified the 5 most common symptoms: fever, dyspnea, fatigue, cough, and diarrhea/vomiting. It is important to note that diarrhea and vomiting were frequently grouped together in the descriptions within our sampled posts, leading us to categorize them as a single item.

We coded the presence of symptoms as 1 and the absence as 0. We then added the score(s) to create a "completeness" variable for self-disclosure about symptoms, with values ranging from 0 to 5, to assess individuals' health statuses.

Chest CT results

According to Zhong et al.,⁴³ there are 6 manifestations of COVID-19 infection identifiable in chest CT scans: ground-glass opacity, consolidation, fibrous strip shadow, interlobular and/or intralobular septal thickening, subpleural curvilinear line, and traction bronchiectasis. However, since most people are not medical professionals, they may lack a clear understanding of these 6 manifestations as reflected in CT results.

This was reflected in our coding process, where we found that over 80% of the sampled posts from individuals who underwent chest CT scans did not describe these manifestations. Instead, they simply attached CT images or stated the CT results indicated they were (likely) infected. Consequently, the depth or completeness of self-disclosure about chest CT results is not applicable in this research.

As previously clarified, this study only selected posts from individuals who claimed they were (likely) infected. Therefore, posts that disclosed chest CT results or attached CT images may be more credible than those that did not. We coded posts that mentioned chest CT results or included CT images as 1, whereas all other posts were coded as 0.

Identities

Posts from individuals with verified identities or those who claimed to be health professionals (e.g., medics, hospital workers, or medical school students) were coded as 1, whereas those from others were coded as 2 (considered laypeople).

Intercoder Reliability

For the coding process, two native Chinese graduate students majoring in media and communication were invited. Before coding, detailed explanations, definitions, and examples of each item were provided to the coders. After sufficient training, we assessed the intercoder reliability of the two coders by randomly selecting and double-coding 330 posts (14.95%) from the total sample. The

Table 2. Frequencies of social support exchange

		Type of social support	N	% of total social support messages (N = 2,207)
Orientation of social support	Seeking	Informational support	1200	54.4%
		Emotional support	1888	85.5%
		Tangible support	2036	92.3%
		Esteem support	0	0.0%
		Network support	6	0.3%
	Offering	Informational support	406	18.4%
		Emotional support	206	9.3%
		Tangible support	1822	82.6%
		Esteem support	35	1.6%
		Network support	17	0.8%

Cohen's kappa coefficients for each coding item ranged from 0.82 to 0.93, indicating good agreement between the two raters.

Results

The descriptive statistics presented in Table 2 provide an answer RQ1. Out of the 2207 chosen posts from the "COVID-19 Mutual Aid" group, seeking tangible support was the most frequent social support message ($N = 2036$, 92.3%), followed by seeking emotional support ($N = 1888$, 85.5%), offering tangible support ($N = 1822$, 82.6%), and seeking informational support ($N = 1200$, 54.4%). The less common social support messages were offering informational support ($N = 406$, 18.4%), offering emotional support ($N = 206$, 9.3%), offering esteem support ($N = 35$, 1.6%), offering network support ($N = 17$, 0.8%), and seeking network support ($N = 6$, 0.3%). It was observed that posts seeking esteem support were not found in the "COVID-19 Mutual Aid" group. Compared to the orientation of offering, messages seeking social support were more prevalent.

Prior to conducting further analyses, we checked the normality of all variables (see Table 3). We found that identities and the number of reposts exceeded the absolute value based on the criterion of skewness (< 2) and kurtosis (< 7).⁴⁴ This meant that traditional linear regression analysis was not appropriate for testing H1, H2, H3, and H4 because the dependent variable (the number of

Table 3. Summary of statistics of all variables

Variables	N	M or %	SD	Skewness	Kurtosis
Identities	2207	3.1% HP	–	5.390	27.082
The number of reposts	2207	7.16	29.047	14.857	343.225
CSDS	2207	1.42	1.368	0.615	–0.600
SDCT	2207	0.49	0.500	0.570	–1.999
CSSST	2207	2.32	0.886	–1.261	0.851
COSST	2207	1.13	0.711	0.887	2.440

Note: HP = health professionals; CSDS = the completeness of self-disclosure about symptoms; SDCT = self-disclosure of chest CT results; CSSST = the completeness of seeking social support types; COSST = the completeness offering social support types.

reposts) was non-normal, non-continuous, and overdispersed.⁴⁵ Moreover, the variance of the number of reposts was larger than its mean, which violated the assumption of equidispersion for Poisson regression analysis.^{16,46} Denham⁴⁶ suggested that count data (such as retweet frequency) usually follow binomial distributions, and negative binomial regression analysis could be a suitable modeling technique.

However, since there were many zero counts in the number of reposts ($N = 1112$, 50.4%), a standard negative binomial regression model was not ideal either. Based on the methods from similar studies^{47,48} and the recommendations from Feng,⁴⁹ we considered using either zero-inflated negative binomial regression (ZINB model) or hurdle regression model, as they could account for the excess zeros in our dependent variable. To determine which model was more fitting for our data, we used the Vuong test.^{49,50} We finally chose the hurdle model, as the results indicated that it had better fit, because the Vuong z-statistic value (2.798) was positive and significant ($p < 0.05$).

The results of the hurdle regression model are summarized in Table 4. The findings show that posts disclosing symptoms were more likely to be reposted than those without symptoms (aOR = 1.093, $p < 0.05$). Moreover, the number of reposts increased significantly with the number of symptoms disclosed. Specifically, disclosing one more symptom would increase the probability of being reposted by 20.6% (aRR = 1.206, $p < 0.01$). Therefore, H1 was supported.

Regarding the self-disclosure of chest CT results, posts that mentioned chest CT results or attached CT images were also more likely to be reposted than those that did not report CT results (aOR = 1.265, $p < 0.05$). H2 was supported.

When it comes to personal situations, posts that sought social support were more likely to be reposted (aOR=1.536, $p < 0.001$). However, a higher completeness of seeking social support types did not significantly influence the retransmission of the posts (aRR = 1.056, $p = 0.534$). However, posts that offered social support did not significantly affect the likelihood of being reposted (aOR = 1.062, $p = 0.353$), nor did a higher completeness of offering social support types (aRR = 1.101, $p = 0.415$). Thus, H3 and H4 were not supported.

For RQ2, a Chi-Square test (see Table 5) was performed, and a significant difference was observed between health professionals and laypeople in disclosing chest CT results ($\chi^2 = 22.809$, $p < 0.001$). Specifically, 49.5% of laypeople ($N = 1058$, $N_{\text{total}} = 2138$) chose to disclose chest CT results, whereas 79.7% of health professionals ($N = 55$, $N_{\text{total}} = 69$) did the same.

Since the Identities variable was not normally distributed, an independent samples Mann-Whitney U test (see Table 6) was used to investigate RQ3. The results showed that laypeople were more likely to self-disclose their symptoms on Weibo ($M = 1.45$) than the health professionals ($M = 0.57$) ($p < 0.001$).

Discussion

This study looked back to the start of the COVID-19 pandemic in Wuhan, focusing on how online social support exchange was presented, how self-disclosure strategies affected retransmission, and how health professionals and laypeople differed in online mutual support. First, our findings revealed that tangible support, emotional support, and informational support were the most common types sought, which is consistent with previous research that the public had a high demand for health resources, equipment,⁵¹

Table 4. Hurdle regression model (dependent variable: the number of reposts)

	Zero hurdle model (binomial with logit link)						Count model (truncated negbin with log link)					
	B	SE	z value	Adjusted OR	95% CI	P value	B	SE	z value	Adjusted RR	95% CI	P value
Intercept	-1.329	0.148	-9.009	0.265	(0.198, 0.353)	<0.001	-0.729	1.735	-0.421	0.482	(0.016, 14.448)	0.674
CSDS	0.089	0.037	2.415	1.093	(1.017, 1.174)	< 0.05	0.188	0.061	3.061	1.206	(1.070, 1.360)	< 0.01
SDCT	0.235	0.101	2.314	1.265	(1.037, 1.543)	< 0.05	0.060	0.157	0.383	1.062	(0.781, 1.445)	0.702
CSSST	0.429	0.054	7.954	1.536	(1.382, 1.708)	< 0.001	0.054	0.088	0.622	1.056	(0.889, 1.254)	0.534
COSST	0.060	0.065	0.929	1.062	(0.935, 1.206)	0.353	0.096	0.118	0.815	1.101	(0.873, 1.389)	0.415

Note: CSDS = the completeness of self-disclosure about symptoms; SDCT = self-disclosure of chest CT results; CSSST = the completeness of seeking social support types; COSST = the completeness offering social support types.

Table 5. Chi-square test

		Chest CT results			Chi-square	P value
		Yes	No	Total		
		Count	Count	Count		
Identities	Laypeople	1058 (47.9%)	1080 (48.9%)	2138 (96.9%)	22.809	<0.001
	Health professionals	55(0.6%)	14 (2.5%)	69 (3.1%)		
	Total	1135 (48.6%)	1072 (51.4%)	2207 (100%)		

Table 6. Independent samples Mann-Whitney U test

Identities	N	M	SD	Mann-Whitney	
				U	P value
CSDS Laypeople	2138	1.45	1.37	44579.500	<0.001
Health professionals	69	0.57	1.08		

Note: CSDS = the completeness of self-disclosure about symptoms.

information, and emotional support⁵² during the early stage of the outbreak. The restriction policy and panic buying during a pandemic usually worsen resource shortages,⁵³ explaining the prevalence of seeking tangible support on social media. Similarly, the COVID-19 pandemic was perceived as uncertain at the start,⁵⁴ leading to a high demand for informational support on Weibo. Moreover, psychological stress was the most common problem faced by the public during the pandemic, motivating the seeking of emotional support as it can buffer mental stresses.⁵⁵

Moreover, the finding that messages offering social support were less prevalent also demonstrates that Wuhan people were in a tough situation during lockdown, as the amount of help-giving did not match that of help-seeking. However, we can see that tangible needs were well addressed on Weibo, which recognizes the role of social media in organizing mutual-aid movements to some degree. Thus, for future public crises, the administration should place a high value on social media's role in source mobilization,⁵³ psychological interventions,^{56,57,58} correcting misinformation,^{59,60,61} and spreading accurate information.⁵²

Regarding the relationship between the completeness of self-disclosure and retransmission, we observed that users who disclosed more symptoms received more reposts. This can be attributed to the fact that a diverse range of symptom descriptions not only implies higher content credibility, but also reflects disease severity.¹⁹ Especially, disease severity can elicit public empathy,

resulting in positive responses from others.⁶² Therefore, a deep self-disclosure strategy is more likely to generate more social concern during a public health crisis. This finding supports Umar et al.'s⁶³ observation that social media users intentionally self-disclose during the COVID-19 pandemic to gain social attention, rewards, and interactions. However, it should be noted that the practice of disclosing symptoms requires improved health literacy to ensure individuals do not exaggerate their illness. Additionally, the study found that the disclosure of CT results was positively associated with repost frequency, indicating that providing evidence increases information credibility and attracts more attention. Therefore, it is recommended to provide evidence in future online help-seeking activities. Overall, the COVID-19 pandemic has changed the general motivations and ways of disclosing information online,⁶⁴ as traditionally online self-disclosure is driven by convenience for relationship maintenance, relation-building,⁶⁵ enjoyment, and self-presentation.⁶⁶ Our findings highlighted the importance of self-disclosure and evidence-based information in online help-seeking during public health crises.

We also examined the relationship between the completeness of seeking/offering social support types and retransmission in crisis situations. We found that posts that sought social support, regardless of the number and type of support, were more likely to be reposted. This indicates that the public does not differentiate between the various needs of the seekers in times of crisis. They are willing to share any message that expresses a need for help or support. However, we found that posts that offered social support, whether one or multiple types, did not attract more reposts. A possible reason for this is that offering social support types implies that the poster is in a good situation and has the capacity to help others. Compared to the orientation of giving, reposters are more likely to transmit messages that show an urgent situation. This also highlights the importance of empathy in eliciting social concerns.⁶³

In regard to the comparison between health professionals and laypeople, the study found a significant difference in disclosing

CT results. A higher percentage of health professionals (79.7%) disclosed their chest CT results or attached chest CT results compared to laypeople (49.5%). This may be due to the health literacy gap⁶⁷ between the two groups or the easier access to medical resources for health professionals during the lockdown period. Besides, a statistical difference also exists in the disease status between health professionals and laypeople. Health professionals have lower mean scores and standard deviations in the completeness of self-disclosure of symptoms. This may be attributed to the health knowledge gap and health literacy gap.⁶⁸ Health professionals may describe their symptoms more accurately (not exaggerate), or their disease statuses were not severe (they protected themselves better). Although COVID-19 was unfamiliar to everyone in Wuhan at that time, we can see that health professionals still performed at a higher level of coping strategies.⁴⁰ Overall, considering the discussion on the depth of self-disclosure and retransmission, the differences between laypeople and health professionals reveal that possessing a professional background would help cope with public crises.⁶⁸

Conclusion

Since the beginning of the COVID-19 pandemic, discussions and concerns about this public health crisis have never ceased. The pandemic and its secondary impacts generated many uncertainties for people to understand and handle the unacquainted disease at the early stage of the outbreak.⁶⁹ Now, with the accumulation of experience from all over the world, we can better recognize the virus and our situations. However, looking back at the beginning of the pandemic, the Wuhan people, who were the first vulnerable group to face uncertainty, struggled in the dark. In memory of the heroic deeds of the Wuhan people and to provide guidance for future crises, this study explored how Wuhan people coped with the unprecedented public health crisis on Weibo. Through a quantitative content analysis, 2207 valid Weibo posts tagged with “COVID-19 Mutual Aid” were analyzed. Descriptive statistics reveal that messages seeking tangible support, emotional support, and informational support were prevalent at the start of the pandemic. Our hurdle regression model illustrates that disclosing CT results and a deeper level of disclosure in disease statuses and bad personal situations would result in more retransmission. Additionally, the Chi-Square test and Mann-Whitney U test reveal that health professionals and laypeople have different self-disclosure strategies. Overall, our research on how Wuhan social media users were coping with the early phase of the pandemic through seeking and offering support online can inform authorities and individuals in their future responses to public health emergencies. Our findings also emphasize the importance of health knowledge and literacy.

This study has some limitations that should be acknowledged. First, the original data collected from Weibo posts contain rich information that could be further explored from various dimensions, but this study only focused on a few perspectives due to time and resource constraints. Second, the sample size of health professionals was relatively small compared to the number of ordinary people, which may affect the representativeness of the results. However, given that health professionals account for less than 1% of the total population in Hubei Province,⁷⁰ the sample size was considered reasonable. Third, as the data were retrieved on January 11, 2022, about 2 years after the sampling period, some posts may have been hidden, deleted, or censored by the users or the platform, which could lead to data loss. Finally, the generalizability of

Wuhan's experience of an unprecedented crisis to other contexts is uncertain. Future research should examine how people from different countries cope with the first lockdowns or the first wave of pandemic outbreaks with the help of social media platforms.

Author contribution. Yu Guo: conceptualization, data curation, writing - original draft, writing - review & editing, supervision, project administration, funding acquisition; Hongzhe Xiang: conceptualization, methodology, formal analysis, writing - original draft, writing - review & editing, project administration; Yongkang Hou: conceptualization, writing - review & editing

Funding information. This study is supported by Higher Education Fund of Macau SAR Government (HSS-MUST-2021-02).

Competing interest. No conflict of interest declared.

Ethical standard. We declare that this study has been ethically reviewed and approved by board members of the Faculty of Humanities and Arts at Macau University of Science and Technology and is exempt from further ethical review as it uses only unobtrusive data/public data (social media data) and does not involve any interactions or interventions with human or animal subjects.

References

1. Wen M, Zhang S, McGhee D. From preventing physical infection to managing affective contagion: an initial study of daily nursing practices in the early outbreak of the COVID-19 pandemic in Wuhan. *Soc Sci Med.* 2023;329:116033. doi:10.1016/j.socscimed.2023.116033
2. Cousins S. WHO hedges its bets: the next global pandemic could be disease X. *BMJ. Published online May 10, 2018;k2015.* doi:10.1136/bmj.k2015
3. FeldmanHall O, Shenhav A. Resolving uncertainty in a social world. *Nat Hum Behav.* 2019;3(5):426–435. doi:10.1038/s41562-019-0590-x
4. Zhu H, Wei L, Niu P. The novel coronavirus outbreak in Wuhan, China. *Glob Health Res Policy.* 2020;5(1). doi:10.1186/s41256-020-00135-6
5. El Zowalaty ME, Järhult JD. From SARS to COVID-19: a previously unknown SARS-related coronavirus (SARS-CoV-2) of pandemic potential infecting humans – Call for a One Health approach. *One Health.* 2020;9:100124. doi:10.1016/j.onehlt.2020.100124
6. Callard F, Perego E. How and why patients made Long Covid. *Soc Sci Med.* 2021;268:113426. doi:10.1016/j.socscimed.2020.113426
7. Jin YH, Cai L, Cheng ZS, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Military Med Res.* 2020;7(1). doi:10.1186/s40779-020-0233-6
8. Russell D, Spence NJ, Chase JAD, et al. Support amid uncertainty: Long COVID illness experiences and the role of online communities. *SSM Qual Res Health.* 2022;2:100177. doi:10.1016/j.ssmqr.2022.100177
9. Qian Y, Hanser A. How did Wuhan residents cope with a 76-day lockdown? *Chinese Sociol Rev.* 2020;53(1):55–86. doi:10.1080/21620555.2020.1820319
10. Cheng P, Xia G, Pang P, et al. COVID-19 epidemic peer support and crisis intervention via social media. *Community Ment Health J.* 2020;56(5):786–792. doi:10.1007/s10597-020-00624-5
11. Guo Y, Hou Y, Xiang H, et al. “Help Us!”: a content analysis of COVID-19 help-seeking posts on Weibo during the first lockdown. *BMC Public Health.* 2023;23(1). doi:10.1186/s12889-023-15578-y
12. Hanson S, Belderson P, Ward E, et al. Lest we forget. Illuminating lived experience of the Covid-19 pandemic and lockdown. *Soc Sci Med.* Published online July 2023;116080. doi:10.1016/j.socscimed.2023.116080
13. Jong W, Liang OS, Yang CC. The exchange of informational support in online health communities at the onset of the COVID-19 pandemic: content analysis (preprint). *JMIRx Med.* Published online January 26, 2021. doi:10.2196/27485
14. Schuchat A. Public health response to the initiation and spread of pandemic COVID-19 in the United States, February 24–April 21, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(18):551–556. doi:10.15585/mmwr.mm6918e2
15. Saud M, Mashud M, Ida R. Usage of social media during the pandemic: seeking support and awareness about COVID-19 through social media

- platforms. *J Public Aff*. Published online September 15, 2020:e02417. doi:10.1002/pa.2417
16. **Seiter CR, Brophy NS**. Social support and aggressive communication on social network sites during the COVID-19 pandemic. *Health Commun*. 2021;37(10):1295–1304. doi:10.1080/10410236.2021.1886399
 17. **Derlega VJ, Metts S, Petronio S**, et al. *Self-Disclosure*. Sage; 1993.
 18. **Mesch GS, Bekker G**. Are norms of disclosure of online and offline personal information associated with the disclosure of personal information online? *Hum Commun Res*. 2010;36(4):570–592. doi:10.1111/j.1468-2958.2010.01389.x
 19. **Luo C, Li Y, Chen A**, et al. What triggers online help-seeking retransmission during the COVID-19 period? Empirical evidence from Chinese social media. *PLoS One*. 2020;15(11):e0241465. doi:10.1371/journal.pone.0241465
 20. **Stvilia B, Mon L, Yi YJ**. A model for online consumer health information quality. *J Am Soc Inf Sci Tec*. 2009;60(9):1781–1791. doi:10.1002/asi.21115
 21. **Bates BR, Romina S, Ahmed R**, et al. The effect of source credibility on consumers' perceptions of the quality of health information on the Internet. *Medical Inform Internet Med*. 2006;31(1):45–52. doi:10.1080/14639230600552601
 22. **Barry CL, Schamber L**. Users' criteria for relevance evaluation: a cross-situational comparison. *Inform Process Manag*. 1998;34(2-3):219–236. doi:10.1016/s0306-4573(97)00078-2
 23. **Cline RJW, Haynes KM**. Consumer health information seeking on the Internet: the state of the art. *Health Educ Res*. 2001;16(6):671–692. doi:10.1093/her/16.6.671
 24. **Eysenbach G, Powell J, Kuss O**, et al. Empirical studies assessing the quality of health information for consumers on the world wide web. *JAMA*. 2002;287(20):2691. doi:10.1001/jama.287.20.2691
 25. **Pan W, Feng B, Skye Wingate V**. What you say is what you get: how self-disclosure in support seeking affects language use in support provision in online support forums. *J Lang Soc Psychol*. 2017;37(1):3–27. doi:10.1177/0261927x17706983
 26. **Wingate VS, Feng B, Kim C**, et al. The influence of self-disclosure in online support seeking on quality of received advice. *J Lang Soc Psychol*. 2020;39(3):397–413. doi:10.1177/0261927x20911989
 27. **Liu X, Lu J, Wang H**. When health information meets social media: exploring virality on Sina Weibo. *Health Commun*. 2016;32(10):1252–1260. doi:10.1080/10410236.2016.1217454
 28. **Wang X, Chen L, Shi J**, et al. What makes cancer information viral on social media? *Comput Hum Behav*. 2019;93:149–156. doi:10.1016/j.chb.2018.12.024
 29. **Yang Q, Tufts C, Ungar L**, et al. To retweet or not to retweet: understanding what features of cardiovascular tweets influence their retransmission. *J Health Commun*. 2018;23(12):1026–1035. doi:10.1080/10810730.2018.1540671
 30. **Zhu J, Ji P, Pang J**, et al. Clinical characteristics of 3062 COVID-19 patients: a meta-analysis. *J Med Virol*. 2020;92(10):1902–1914. doi:10.1002/jmv.25884
 31. **Huang HY**. Examining the beneficial effects of individual's self-disclosure on the social network site. *Comput Hum Behav*. 2016;57:122–132. doi:10.1016/j.chb.2015.12.030
 32. **Kanne JP, Bai H, Bernheim A**, et al. COVID-19 imaging: what we know now and what remains unknown. *Radiology*. 2021;299(3):E262–E279. doi:10.1148/radiol.2021204522
 33. **Kwee TC, Kwee RM**. Chest CT in COVID-19: what the radiologist needs to know. *RadioGraphics*. 2020;40(7):1848–1865. doi:10.1148/rg.2020200159
 34. **Barrera M Jr**. Distinctions between social support concepts, measures, and models. *AM J Commun Psychol*. 1986;14(4):413–445. doi:10.1007/bf00922627
 35. **Glanz K, Rimer BK, Viswanath K**. *Health Behavior and Health Education: Theory, Research, and Practice*. 4th ed. Jossey-Bass; 2008.
 36. **Luo C, Ji K, Tang Y, Du Z**. Exploring the expression differences between professionals and laypeople toward the COVID-19 vaccine: text mining approach. *J Med Internet Res*. 2021;23(8):e30715. doi:10.2196/30715
 37. **Albarrak AI, Mohammed R, Al Elayan A**, et al. Middle East Respiratory Syndrome (MERS): comparing the knowledge, attitude and practices of different health care workers. *J Infect Public Health*. 2021;14(1):89–96. doi:10.1016/j.jiph.2019.06.029
 38. **Chaudhuri A, Mukherjee A, Chakraborty S**, et al. A study to compare the correlation of perceived stress and insomnia between health professionals and other employees in a government medical college of Eastern India. *Curr Med Issues*. 2022;20(1):22. doi:10.4103/cmi.cmi_88_21
 39. **Hafiz TA, D'Sa JL, Zamzam S**, et al. Helicobacter pylori infection: comparison of knowledge between health science and non-health science university students. *Int J Env Res Public Health*. 2021;18(15):8173. doi:10.3390/ijerph18158173
 40. **Larrouy-Maestri P, Magis D, Grabenhorst M**, et al. Layman versus professional musician: who makes the better judge? *PLoS One*. 2015;10(8):e0135394. doi:10.1371/journal.pone.0135394
 41. **Covello VT, Flamm WG, Rodricks JV**, et al. *The Analysis of Actual Versus Perceived Risks*. Springer; 1983.
 42. **Cutrona CE, Suhr JA**. Controllability of stressful events and satisfaction with spouse support behaviors. *Commun Res*. 1992;19(2):154–174. doi:10.1177/009365092019002002
 43. **Zhong L, Zhang S, Wang J**, et al. Analysis of chest CT results of coronavirus disease 2019 (COVID-19) patients at first follow-up. *Can Respir J*. 2020;2020:1–8. doi:10.1155/2020/5328267
 44. **Curran PJ, West SG, Finch JF**. The robustness of test statistics to non-normality and specification error in confirmatory factor analysis. *Psychol Methods*. 1996;1(1):16–29. doi:10.1037/1082-989x.1.1.16
 45. **Oztig II, Askin OE**. Human mobility and coronavirus disease 2019 (COVID-19): a negative binomial regression analysis. *Public Health*. 2020;185:364–367. doi:10.1016/j.puhe.2020.07.002
 46. **Denham BE**. Poisson and negative binomial regression. In: Denham BE, ed. *Categorical Statistics for Communication Research*. John Wiley & Sons, Ltd; 2017:216–231. Accessed August 7, 2023. <https://doi.org/10.1002/9781119407201.ch10>
 47. **Xie J, Liu L**. Identifying features of source and message that influence the retweeting of health information on social media during the COVID-19 pandemic. *BMC Public Health*. 2022;22(1). doi:10.1186/s12889-022-13213-w
 48. **Muniz-Rodriguez K, Schwind JS, Yin J**, et al. Exploring social media network connections to assist during public health emergency response: a retrospective case-study of Hurricane Matthew and Twitter users in Georgia, USA. *Disaster Med Public*. 2023;17. doi:10.1017/dmp.2022.285
 49. **Feng CX**. A comparison of zero-inflated and hurdle models for modeling zero-inflated count data. *J Stat Distrib Appl*. 2021;8(1):1–19. doi:10.1186/s40488-021-00121-4
 50. **Cameron AC, Trivedi PK**. *Microeconometrics: Methods and Applications*. Cambridge University Press; 2005. Accessed November 25, 2023. <https://doi.org/10.1017/cbo9780511811241>
 51. **Yin F, Lv J, Zhang X**, et al. COVID-19 information propagation dynamics in the Chinese Sina-microblog. *Math Biosci Eng*. 2020;17(3):2676–2692. doi:10.3934/mbe.2020146
 52. **Liu Y, Zhu Y, Xia Y**. Support-seeking strategies and social support provided in Chinese online health communities related to COVID-19. *Front Psychol*. 2021;12. doi:10.3389/fpsyg.2021.783135
 53. **Pickles H**. Using lessons from the past to plan for pandemic flu. *BMJ*. 2006;332(7544):783.1–786. doi:10.1136/bmj.332.7544.783
 54. **Sidi H**. The psychological sequelae during mental health and COVID-19 pandemic: learning from the past for today's coping styles. *Med & Health*. 2020;15(1):1–4. doi:10.17576/mh.2020.1501.01
 55. **Szkody E, Stearns M, Stanhope L**, et al. Stress-buffering role of social support during COVID-19. *Fam Process*. 2020;60(3):1002–1015. doi:10.1111/famp.12618
 56. **Saltzman LY, Hansel TC, Bordnick PS**. Loneliness, isolation, and social support factors in post-COVID-19 mental health. *Psychol Trauma-US*. 2020;12(S1): S55–S57. doi:10.1037/tra0000703
 57. **Shah K, Kamrai D, Mekala H**, et al. Focus on mental health during the coronavirus (COVID-19) pandemic: applying learnings from the past outbreaks. *Cureus*. Published online March 25, 2020. doi:10.7759/cureus.7405
 58. **Yu H, Li M, Li Z**, et al. Coping style, social support and psychological distress in the general Chinese population in the early stages of the COVID-19 epidemic. *BMC Psychiatry*. 2020;20(1). doi:10.1186/s12888-020-02826-3
 59. **Bode L, Vraga EK**. See something, say something: correction of global health misinformation on social media. *Health Commun*. 2017;33(9):1131–1140. doi:10.1080/10410236.2017.1331312
 60. **van der Meer TGLA, Jin Y**. Seeking formula for misinformation treatment in public health crises: the effects of corrective information type and source. *Health Commun*. 2019;35(5):560–575. doi:10.1080/10410236.2019.1573295

61. **Walter N, Brooks JJ, Saucier CJ**, et al. Evaluating the impact of attempts to correct health misinformation on social media: a meta-analysis. *Health Commun.* 2020;**36**(13):1776–1784. doi:10.1080/10410236.2020.1794553
62. **Qin X, Yang F, Jiang Z**, et al. Empathy not quarantined: social support via social media helps maintain empathy during the COVID-19 pandemic. *Soc Media Soc.* 2022;**8**(1):205630512210862. doi:10.1177/20563051221086234
63. **Umar P, Akiti C, Squicciarini A**, et al. Self-disclosure on Twitter during the COVID-19 pandemic: a network perspective. In: Dong Y, Kourtellis N, Hammer B, Lozano JA, eds. *Machine Learning and Knowledge Discovery in Databases. Applied Data Science Track*. Springer International Publishing; 2021:271–286. Accessed August 7, 2023. https://doi.org/10.1007/978-3-030-86514-6_17
64. **Nabity-Grover T, Cheung CMK, Thatcher JB**. Inside out and outside in: how the COVID-19 pandemic affects self-disclosure on social media. *Int J Inform Manage.* 2020;**55**:102188. doi: 10.1016/j.ijinfomgt.2020.102188
65. **Liu Z, Min Q, Zhai Q**, et al. Self-disclosure in Chinese micro-blogging: a social exchange theory perspective. *Inform Manage-Amster.* 2016;**53**(1): 53–63. doi:10.1016/j.im.2015.08.006
66. **Kramer NC, Haferkamp N**. Online self-presentation: balancing privacy concerns and impression construction on social networking sites. In: Trepte S, Reinecke L, eds. *Privacy Online: Perspectives on Privacy and Self-Disclosure in the Social Web*. Springer; 2011:127–141.
67. **Do BN, Tran TV, Phan DT**, et al. Health literacy, eHealth literacy, adherence to infection prevention and control procedures, lifestyle changes, and suspected COVID-19 symptoms among health care workers during lockdown: online survey. *J Med Internet Res.* 2020;**22**(11):e22894. doi: 10.2196/22894
68. **Voigt-Barbarowicz M, Dietz G, Renken N**, et al. Patients' health literacy in rehabilitation: comparison between the estimation of patients and health care professionals. *Int J Env Res Public Health.* 2022;**19**(6):3522. doi: 10.3390/ijerph19063522
69. **Ciotti M, Angeletti S, Minieri M**, et al. COVID-19 outbreak: an overview. *Chemotherapy.* 2019;**64**(5-6):215–223. doi:10.1159/000507423
70. **Statistical Bulletin of National Economic and Social Development of Hubei Province in 2019**. Hubei Provincial People's Government. Published June 1, 2020. Accessed August 20, 2022. http://www.hubei.gov.cn/xxgk/zfbmwj/202006/t20200601_2373471.shtml