



# Coping strategies, stigmatizing attitude, and cyberbullying among Chinese college students during the COVID-19 lockdown

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## Abstract

The ongoing COVID-19 pandemic provides hotbed for hatred and violence, which could be especially true among college students, the most active users of internet and social media. Based on a national sample of Chinese college students ( $N=1,673$ ), the present study aims to explore the clustered nature of stress coping strategies, as well as its associations with the participants' stigmatizing attitude and cyberbullying behaviors towards people in Hubei Province, the place where the first COVID-19 case was reported and recognized as China's epicenter of the pandemic. Four latent subgroups were first identified among the participants based on type and comparative adoption rate of their coping strategies, namely the emotional coping group, the inactive coping group, the support-seeking and positive coping group, and the independent and positive coping group. The significant associations between coping strategy patterns and stigmatizing attitude and cyberbullying behaviors were reported, respectively. The two were most likely to happen among the participants using emotional coping while the least likely among the independent and positive coping group. This study provides empirical supports for combating the secondary disasters of the pandemic, namely stigma and cyberbullying, by identifying the role of emotional and positive coping strategies.

**Keywords** COVID-19 · Stigmatizing attitude · Cyberbullying · Coping strategies · College students

## Introduction

Students in higher education are faced with increasing risks of hatred and violence during the COVID-19 pandemic, especially stigmatizing and cyberbullying (Alsawalqa, 2021; Kim & Choi, 2021). The major reason could be the more reliance on electronic devices and social media under the implementation of social distancing rules and online courses (Chiolero, 2020). Hatred and violence are closely associated with loneliness, fear, hopelessness, and self-esteem

reduction, which could further increase the risk of behavioral and emotional problems, such as alcohol misuse, depression, and suicide (Holmes et al., 2020; Yang, 2021).

College students and other young people could experience multiple stressors caused by the COVID-19, including fear of exposure, widespread rumors, and reduced job opportunities (Altena et al., 2020; Qiu et al., 2020). According to McCauley et al. (2013), people have soothed their stress of disease outbreaks by stigmatizing certain social groups throughout the history. In a similar vein, people living in Hubei, China's epicenter of the COVID-19 pandemic, are faced with high risks of stigmatization (Goh, 2020). Since late February of 2020, when the pandemic had spread for over two months and reached the peak in China, the whole country was strictly locked down and the resulting inconveniences and losses started to drive people crazy. Fear of the virus and suspicious people prevailed, and the social mood was fueled and distorted by tons of rumors about Hubei people and Hubei government's misconducts in dealing with the pandemic (Yang & Huang, 2021). As a result, hating and stigmatizing any people or things that had connection with Hubei Province became popular. Because of the lock-down

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policy, people's hatred and stigmatization attitude towards Hubei people were conveyed mainly through internet.

And in the digital age, especially when lockdown is implemented, stigmatization and cyberbullying behaviors could easily run rampant. At the same time, people adopt various strategies to cope with the pandemic-related life stressors. These coping strategies may affect people's aggressive behaviors, especially those of young people (Bodenmann et al., 2010; DiClemente & Richards, 2019). Therefore, exploring coping strategies may have implications for reducing the hatred and violence associated with the pandemic.

### Hatred and Violence in Public Health Crisis

The past literature has well documented the increase of hatred and violence in public health crisis. Especially, the wide application of social media makes stigmatizing attitudes and cyberbullying behaviors more prevalent in the current COVID-19 pandemic (Wong et al., 2020). Two major forms of stigmatization during the public health crisis period were reported, including (1) stigmatizing people infected with certain disease (Garaigordobil & Larrain, 2020); and (2) stigmatizing people with certain demographic characteristics that relate with that disease, which is now best represented by people in Hubei, the place where the first COVID-19 case was reported (Goh, 2020). At the same time, according to Mishna et al. (2020), cyberbullying is largely a result of perceived difference and is bias or stigma-based. And the intersectionality of different types of stigmatization may exacerbate cyberbullying (Lauckner et al., 2019; Mishna et al., 2020).

During the COVID-19 pandemic when unprecedented digital interconnectedness and intense media coverage have amplified the pandemic-associated psychological fear, college students had to stay indoors and move their classes online for prolonged periods of time (Chiolero, 2020), which could significantly influence their social network and make them more mentally vulnerable (Altena et al., 2020). During this period, they could use electronic devices excessively, be more easily affected by online rumors and biased news, and vent their negative emotions online (Wong et al., 2020). Though it is obvious that the COVID-19 provides hotbed for stigmatizing attitude and cyberbullying behaviors, still little is known about their prevalence among college students during the lockdown.

### Coping Strategy and Its Clustered Nature

Taylor and Stanton (2007) defined coping strategy as "conscious volitional efforts to regulate emotion, thought, behavior, physiology and the environment in response to stressful events or circumstances". Fluharty and Fancourt (2021)

found that people in UK would adopt varied coping strategies during COVID-19 pandemic, according to the availability of resources used to deal with a stressor. That is, persons with sufficient resources may select a positive-engaged coping strategy, such as finding a good balance between emotional expression and emotional regulation, or cognitive restructuring; while those with insufficient resources may adopt a negative-engaged coping strategy, such as avoidance or antagonizing people who seem threatening.

Other researchers revealed different factor structures of coping strategy. For instance, Endler et al. (1998) found that people may choose from three types of coping strategies, including problem-focused coping, emotion-focused coping, and avoidant coping, when faced with health problems. Moreover, based on a French sample, Doron et al. (2014) put forward a five-factor coping strategy model, namely problem-solving, support-seeking, avoidance, cognitive restructuring, and distraction. It is worth noting that no evidence yet has been reported as with college students' coping strategies during the COVID-19 pandemic.

### Stress Coping Styles and Hatred and Violence

The coping strategies adopted in stressful environment may influence one's incidence of adopting negative attitude and conducting aggressive behaviors (Borders & Liang, 2011; Yang, et al., 2021). For instance, adopting positive coping strategies, such as seeking instrumental support and using forgiveness, can alleviate one's stressor-related depression and thus decrease aggressive behaviors when facing with life stressors (Austin & Falconier, 2012); on the other hand, young adults who use negative coping strategies, such as avoidance and substance abuse, to deal with stressors could have elevated risks of depression and internet addiction, which in turn increase one's problem behaviors (Cao & Yang, 2018; Chou et al., 2018).

It is also worth noting that some coping strategies might influence the stigma/discrimination and aggressive behaviors through different pathways (Baillien et al., 2011). For example, as a coping strategy, rumination may mediate the correlation between people's perceived ethnic discrimination and aggressive behavior (Borders & Liang, 2011). Moreover, Van den Brande et al. (2016) reported that problem-focused coping, reappraisal coping, and active coping can buffer the strain outcomes (e.g., bullying) of environment/work stressors, while emotional coping and avoidant coping might increase the association.

### The Present Study

Most studies on cyberbullying among college students are about cyberbullying prevalence, characteristics of cyberbullies, and the emotional and behavioral consequences for both

victims and bullies (Gahagan et al., 2016; Gibb & Devereux, 2014). Few studies have focused on its association with bullies' coping strategies of stressors. Moreover, still little evidence has been reported on how coping strategies correlate with stigmatizing attitude in a health crisis context. Based on the stress-coping theory (Lazarus & Folkman, 1984), the present study aims to answer the following three research questions using a national sample of Chinese college students in the context of the national lockdown:

- Research Question 1: What are the patterns of college students' coping strategies during the COVID-19 lockdown?
- Research Question 2: What is the association between college students' coping strategy patterns and their stigmatizing attitude towards people in the COVID-19 epicenter?
- Research Question 3: What is the association between college students' coping strategy patterns and their cyberbullying behaviors towards people in the COVID-19 epicenter?

## Methods

### Participants and Procedures

Data collection occurred between February 22<sup>nd</sup> and February 29<sup>th</sup>, 2020, when was the peak period of COVID-19 pandemic in China and strict social distancing rules were applied nationwide. We conducted an online survey on Chinese people's coping strategies of the pandemic as well as their mental health situation. The eligibility criteria include: 1) aged 16 or above; 2) being able to provide an informed consent, and 3) living in China. Screening with criteria 1) being a current college student; and 2) not in Hubei Province (the key epidemic area in China), we included 1,673 college students into the present study.

A professional online survey platform was utilized to deliver the electronic questionnaire. The platform generated the web link and QR code for the questionnaire, and research assistants pasted the link and code on the bulletin board system (BBS) of each Chinese province's gateway website. Using the link or code, participants can access to the questionnaire and answer the questions anonymously. We also asked initial participants to diffuse the questionnaire through their social networks. All finished questionnaires were automatically sent back to and stored by the platform, which were available to be transformed into downloadable formats. Electronic informed consent was obtained from the participants before beginning the data collection. Ethical

approval was obtained from the Ethics Committee for Scientific Research of the corresponding author's university.

## Measures

### Cyberbullying Behaviors

The cyberbullying scale devised and validated by Patchin and Hinduja (2015) was utilized to measure participants' cyberbullying behaviors. As a cyberbullying screening instrument with good criterion validity, the scale's usefulness has been demonstrated in different populations across the globe (Kazerooni et al., 2018; Palladino et al., 2017), including in China (Chen et al., 2018). It consists of nine items (e.g., "someone posted mean or hurtful comments/picture/video about me online", "someone spread rumors about me online", "someone threatened to hurt me online"), which covers eight distinct cyberbullying behaviors and one global question on whether cyberbully others in the previous 30 days. In the present study, participants who reported one or more cyberbullying behaviors were coded as "1", and those reporting no cyberbullying behaviors were coded as "0".

### Stigmatizing Attitude

The present study measured stigmatizing attitude by one single item, namely the participants' self-rated hatred towards people in Hubei Province. The score ranged from 0 to 10.

### Coping Strategy Pattern

The present study used the Brief COPE Inventory by Carver (1997) to measure participants' coping strategies of the stressors related with the COVID-19 pandemic. It includes 14 two-item scales (e.g. "I've been turning to work or other activities to take my mind off things" and "I've been concentrating my efforts on doing something about the situation I'm in") that measure 14 conceptually differentiable coping reactions, namely acceptance, active coping, positive reframing, planning, using instrumental support, using emotional support, behavioral disengagement, self-distraction, self-blame, humor, denial, religion, venting, and substance use. Participants scored each of the 28 items from 1 to 4 with 1 being "Not true of me" and 4 being "Always true of me". That is, the value range of each subscale is from 0 to 8.

To meet the requirement of latent class analysis, we coded the score of each subscale into a dummy variable. According to Zukel et al. (1981), categorization of the various ordinal response formats for the latent class indicators was based on an epidemiological risk factor model. This approach takes each measure and assigns a "1" to individuals scoring in the upper portion of the distribution and "0" to the remainder of

the distribution. Following the standards set by Kosten et al. (2012), we took as close to the upper quartile as feasible assigning members of this quadrant a “1” for risk, namely adoption of the coping strategy.

### Covariates

The present study controlled for the demographic variables of the participants, namely gender (male = 0, female = 1), age (in years), and educational level (undergraduate = 0, postgraduate = 1). We also controlled for the participants' health and economic situation: 1) self-rated health, ranging from 1 to 5 with 1 being “very poor” and 5 being “very good”; and 2) relative socioeconomic status of the participant's current residential neighborhood in his/her prefecture, ranging from 1 to 5 with 1 being “very low” and 5 being “very high”.

### Statistical Analysis

The analysis process of the present study was comprised by two stages. First, the latent class analyses (LCAs) were conducted to explore the number and nature of the subtypes of the participants' coping strategy pattern based on the adoption of each of the fourteen coping strategies in the Brief COPE inventory. The advantage of this method is that it takes into account the interrelationship and combined effects between participants' coping strategies. The LCAs were tested using the Mplus statistical program with maximum likelihood parameter estimation and the Estimation-Maximization algorithm (Muthén & Muthén, 2017).

A parsimonious 2-class model was tested first, which was followed by sequentially increasing number of classes up to a 5-class model. Based on the work of Nylund, et al. (2007), four statistical fit indices for the latent class model were used in selecting the optimal number of latent classes, namely Akaike information criterion (AIC), Bayesian information criterion (BIC), the Lo–Mendell–Rubin's adjusted likelihood ratio test (LRT), and entropy measures. Smaller observed values of AIC and BIC are better and indicate greater model parsimony. The AIC and BIC differ only with regard to the “weight” they attribute to model parsimony (Henson et al., 2007). The Lo–Mendell–Rubin's LRT statistic is also an indicator for comparing models: a non-significant value ( $p > 0.05$ ) suggests that the model with one less class should be accepted. Finally, entropy is a summary measure of classification certainty once posterior class probabilities are obtained. Entropy values can range from 0 to 1, with higher values indicating a better classification.

In the second stage, the coping strategy class membership was used as the independent variable. It was first put into a hierarchical regression model, with stigmatizing attitude as dependent variable; then it was included in a logistic

regression model, with cyberbullying behavior as dependent variable. Both models controlled for the demographic variables. The aim was to examine whether coping strategies of the pandemic were associated with college students' stigmatizing attitude and cyberbullying behaviors towards people from the COVID-19 epicenter, namely Hubei Province of China. All the data analyses were conducted using MPLUS 8.0.

## Results

### Descriptive Statistics

Table 1 presents the descriptive statistics of the research variables. Among the participants, 1,083 (64.7%) were females and 1,318 (78.8%) were undergraduate students; their age ranged from 17 to 40 ( $M = 21.42$ ,  $SD = 2.72$ ). The average score for self-rated health, neighborhood socioeconomic status, and cyberbullying behaviors was 4.25, 3.02, and 1.32, respectively. Moreover, the adoption rate of each of the fourteen coping strategies was between 25.9% (religion) and 57.1% (planning).

**Table 1** Descriptive statistics for the research variables ( $N = 1,673$ )

	<i>M (SD) / N (%)</i>
Gender	
Male	590 (35.3%)
Female	1,083 (64.7%)
Age (17–40 years)	21.42 (2.72)
Educational level	
Undergraduates	1,318 (78.8%)
Postgraduates	355 (21.2%)
Self-rated health (1–5)	4.25 (.75)
Neighborhood SES (1–5)	3.02 (.97)
Stigmatizing attitude (0–10)	2.48 (2.60)
Acceptance	697 (41.7%)
Active coping	647 (38.7%)
Positive reframing	584 (34.9%)
Planning	956 (57.1%)
Using instrumental support	701 (41.9%)
Using emotional support	763 (45.6%)
Disengagement	518 (31.0%)
Self-distraction	619 (37.0%)
Self-blame	665 (39.7%)
Humor	439 (26.2%)
Denial	546 (32.6%)
Religion	433 (25.9%)
Venting	747 (44.7%)
Substance use	435 (26.0%)
With cyberbullying behavior	172 (10.3%)

**Table 2** Fit indices for the latent class analysis of problem behavior patterns

Model	AIC	BIC	<i>p</i> for LRT	Entropy
2 classes	27,568	27,725	.000	.903
3 classes	26,025	26,264	.000	.836
4 classes	25,612	25,932	.001	.803
5 classes	25,302	25,703	.587	.801

**Table 3** Distribution of the 14 coping strategies in the four latent classes (*N* = 1,673)

	Class 1	Class 2	Class 3	Class 4
	Frequencies (within class %)			
Disengagement	95.50%	22.90%	22.80%	5.60%
Denial	95.10%	21.80%	30.50%	4.10%
Humor	70.10%	8.30%	27.10%	19.00%
Religion	80.20%	9.00%	25.70%	10.20%
Self-blame	87.30%	19.20%	47.60%	23.10%
Substance use	93.70%	18.60%	13.20%	4.10%
Venting	89.20%	15.50%	75.20%	9.40%
Use of emotional support	72.40%	12.70%	83.10%	19.60%
Use of instrumental support	71.60%	10.10%	82.50%	7.00%
Acceptance	11.60%	17.50%	63.90%	69.60%
Active coping	9.70%	7.90%	59.70%	78.10%
Planning	75.00%	17.00%	82.00%	69.00%
Positive reframing	7.80%	3.70%	57.40%	71.30%
Self-distraction	10.10%	14.90%	62.20%	54.70%

*N* = 268 for Class 1; *N* = 542 for Class 2; *N* = 521 for Class 3; *N* = 342 for Class 4

## Results of the Latent Class Analyses

The LCAs demonstrated the clustered nature of the participants' coping strategies of the COVID-19 pandemic. Table 2 reports the results of the latent class analysis model testing procedure using the fourteen latent class indicators of coping strategy. Models were tested from the 2-class to a 5-class model. Based on the standards stated in the methods section, the four-class model showed the best model fit: the AIC and BIC were lower than the three-class model, the LRT indicated that the five-class model was not significantly better than the four-class model (and so the four-class solution should be preferred on the basis of parsimony) and the entropy value was acceptable.

Table 3 reported the endorsement rate of each coping strategy under the four-class model. As for the Class 1, participants belonging to this class were most likely to use disengagement, denial, humor, religion, self-blame, and venting to cope with the COVID-19 related stress, which belong to emotion-focused strategies. Therefore, this class was labeled

as “emotional coping group”, and it included 268 participants. Participants belonging to Class 2 ranked bottom in humor, religion, use of emotional support, active coping, planning, and positive reframing, and they ranked second to last in use of instrumental support. That is, they were not likely to use positive coping or seek supports. Meanwhile, the percentages of using other coping strategies for this class were also relatively low. Therefore, this class, containing 542 participants, was labelled as “inactive coping group”.

Participants in Class 3 were found most likely to seek emotional and instrumental support. Meanwhile, they were most likely or second most likely to adopt positive coping strategies, including planning, self-distraction, acceptance, active coping, and positive reframing. Therefore, this class was labelled as “support-seeking and positive coping group”, and it contained 521 participants. Finally, participants in Class 4 were most likely to use positive coping strategies, including acceptance, active coping, and positive reframing, while the least likely to adopt avoidant, negative, or reliant coping behaviors, including disengagement, denial, substance use, and venting. Meanwhile, they were not willing to seek supports: ranking bottom in the use of instrumental support and second to last in the use of emotional support. Considering these characteristics, we labelled this class as “independent and positive coping group”, and it contained 342 participants. It is worth noting that this defining process stemmed from a comparative perspective, and all four groups of participants adopted coping strategies of different types and degree in the pandemic.

## Results of the Regression Analyses

The proposed independent variable for the regression analyses, namely coping strategy patterns, had four categories, which were used to compute three dummy variables comparing the inactive coping group (Class 2), the support-seeking and positive coping group (Class 3), and the independent and positive coping group (Class 4) with the emotional coping group (Class 1). That is, the Class 1 was the reference group. Results of the hierarchical regression analysis and the logistic regression analysis were reported in Tables 4 and 5, respectively. Table 4 reveals the association between coping strategies and stigmatizing attitude towards people in Hubei Province. Compared with Class 1, the stigmatizing attitude of Class 2 ( $b = -1.18$ ,  $p < 0.001$ ), Class 3 ( $b = -1.40$ ,  $p < 0.001$ ), and Class 4 ( $b = -1.80$ ,  $p < 0.001$ ) was significantly lower, controlling for the demographic variables. It is also reported that being older ( $p < 0.01$ ), undergraduate student ( $p < 0.05$ ), and living in better neighborhood ( $p < 0.05$ ) were associated with higher stigmatizing attitude.

Table 5 reports the results of the logistic regression model, with cyberbullying behaviors towards people in Hubei Province as the dependent variable. Compared with

**Table 4** Hierarchical regression results for the effects of coping strategy patterns ( $N=1,673$ )

	Model I	Model II
Constant	3.32 (.79) <sup>***</sup>	3.87 (.79) <sup>***</sup>
Gender (ref: male)	-.29 (.13) <sup>*</sup>	-.11 (.13)
Age	.09 (.03) <sup>**</sup>	.10 (.03) <sup>**</sup>
Education (ref: undergraduate)	-.48 (.21) <sup>*</sup>	-.49 (.21) <sup>*</sup>
Self-rated health	-.17 (.08) <sup>*</sup>	-.11 (.08)
Neighborhood SES	.16 (.07) <sup>*</sup>	.15 (.06) <sup>*</sup>
Class 2 vs. Class 1		-1.18 (.21) <sup>***</sup>
Class 3 vs. Class 1		-1.40 (.19) <sup>***</sup>
Class 4 vs. Class 1		-1.80 (.21) <sup>***</sup>
$R^2$ adjusted	.010 <sup>***</sup>	.054 <sup>***</sup>

The dependent variable is stigmatizing attitude. The reference group is Class 1 (i.e., the emotional coping group). <sup>\*</sup> $p < .05$ ; <sup>\*\*</sup> $p < .01$ ; <sup>\*\*\*</sup> $p < .001$

**Table 5** Logistic regression results for the effects of coping strategy patterns ( $N=1,673$ )

	Model I	Model II
Constant	.33	.52
Gender (ref: male)	.33 [.24, .46] <sup>***</sup>	.40 [.28, .55] <sup>***</sup>
Age	.97 [.89, 1.05]	.98 [.90, 1.06]
Education (ref: undergraduate)	1.30 [.76, 2.22]	1.26 [.72, 2.21]
Self-rated health	.89 [.72, 1.10]	.95 [.76, 1.18]
Neighborhood SES	1.29 [1.10, 1.53] <sup>**</sup>	1.28 [1.08, 1.52] <sup>**</sup>
Class 2 vs. Class 1		.29 [.20, .44] <sup>***</sup>
Class 3 vs. Class 1		.28 [.18, .43] <sup>***</sup>
Class 4 vs. Class 1		.13 [.07, .24] <sup>***</sup>
$R^2$ (Nagelkerke)	.064 <sup>***</sup>	.142 <sup>***</sup>

The dependent variable is cyberbullying behaviors, a dummy variable. The reference group is Class 4 (i.e., the independent and positive coping group). <sup>\*</sup> $p < .05$ ; <sup>\*\*</sup> $p < .01$ ; <sup>\*\*\*</sup> $p < .001$

Class 1, the likelihood of cyberbullying behaviors was 71% lower for Class 2 (Odds ratio = 0.29,  $p < 0.001$ ), 72% lower for Class 3 (Odds ratio = 0.28,  $p < 0.001$ ), and 87% lower for Class 4 (Odds ratio = 0.13,  $p < 0.001$ ), controlling for the demographics of the college students. It is also reported that being male ( $p < 0.001$ ) and living in better neighborhood ( $p < 0.01$ ) were associated with higher likelihood of cyberbullying.

## Discussion

By investigating a national sample of Chinese college students, the present study provides the following answers to the three research questions. First, we found that the coping strategies of the college students during the pandemic

were clustered. Four latent subgroups were identified among the participants based on type and comparative adoption rate of their coping strategies, namely the emotional coping group, the inactive coping group, the support-seeking and positive coping group, and the independent and positive coping group. Second, the stigmatizing attitude towards people in Hubei Province, the place where the first COVID-19 case was reported and recognized as China's epicenter of the pandemic, was significantly different between latent subgroups. Third, the cyberbullying behaviors towards people in Hubei Province, was significantly different between latent subgroups. It is reported that participants adopting emotional coping had highest stigmatizing attitude and were most likely to have cyberbullying behaviors.

The results as with the clustered nature of coping strategy are in line with the previous studies that reported people's stress coping strategies showed a multiple-factor structure. However, different from Endler et al. (1998)'s three-factor model and Doron et al. (2014)'s five-factor model, we revealed a four-factor coping strategy pattern among college students. It is noted that the appropriateness and generalizability of coping strategy typologies are still being debated (Skinner & Zimmer-Gembeck, 2007). Scholars have proposed many alternative categorizations such as through the addition of avoidant coping (Weiss et al., 2019) or dysfunctional coping (Okech et al., 2018). It is argued that type of stressors, resource availability, and stage of recovery should be considered to determine which range of strategies and level of specificity allows for the most efficient assessment of people's use of coping strategies (Doron et al., 2014).

The findings as with the participants' stigmatizing attitude and cyberbullying behaviors towards people in pandemic epicenter as well as their associations with coping strategies are in line with the past literature. According to Puhl and Heuer (2009), stigmatizations can lead societies to form prejudices, frame negative stereotyping, and encourage aggressions towards vulnerable people. These associations are strengthened more than ever in the digital age, when young adults become less cautious in expressing their opinions or prejudices in social media, showing little regard on the impact their views may have at the receiving end (Lim, 2017; Yang & Zhang, 2018). Since internet and social media have opened spaces for conducting different discourses, it becomes a challenge to maintain a complex balance between freedom of expression and the defense of human dignity. For example, Wanniarachchi et al. (2020) noted that when large groups of people post similar biased expressions over a publicly shared medium, the onslaught of negative content can tilt our perceptions on what is considered to be acceptable and what is not acceptable. Moreover, the anonymity brought about by virtuality on the internet makes restraints on voicing one's opinions in open forum void.

Furthermore, past literature also supports the significant role of coping strategies in buffering or exacerbating hatred and violence (Mishna et al., 2020). The present study gives a more detailed picture by revealing that stigmatizing attitude and cyberbullying behaviors were most likely to happen among the participants using emotional coping while the least likely among the independent and positive coping group. According to Völlink et al. (2013), using emotional coping strategies is associated with negative personality characteristics and does not deal with stressors directly, thus it could predict behavioral problems such as agitation and aggression. On the other hand, coping with stressors independently and positively indicates resourcefulness and positive personalities (e.g., optimistic and persistent) that buffer behavioral consequences of stressors (Chao, 2011).

The findings from the present study should be interpreted with the following caveats. First, the cross-sectional design of this study precluded the establishment of causal links between coping strategies, stigmatizing attitude, and cyberbullying behaviors. Future longitudinal research is required to assess change in coping strategy pattern and its influence on stigmatizing attitude and cyberbullying behaviors. Second, although the present study had a nationwide scale, it was based on an online survey which precluded college students who had no access to smart phone or internet during the pandemic. Also, we recruited participants mainly through bulletin board system, which is relatively less used by current Chinese college students. Therefore, it should be cautioned to generalize the findings to the whole Chinese college students. Third, stigmatizing attitude was measured by one global question in this analysis, which might not be accurate enough. Future studies shall apply a multi-dimensional scale to test its prevalence in populations under the background of public health crisis. Fourth, the four-factor structure of coping strategies among Chinese college students might not be applied to their counterparts in other countries, due to the differences in culture, stage of crisis, and government policies on COVID-19. Future studies may compare the factor structure of coping strategies applied by college students in different countries and delve into the factors that contribute to the difference.

## Conclusions

The present study demonstrates the associations between coping strategy patterns and stigmatizing attitude and cyberbullying behaviors among college students during the COVID-19 lockdown. Moreover, it enhances the understanding of college students' coping strategies of the pandemic. The findings regarding the prevalence of stigmatizing attitude and cyberbullying behaviors towards people in Hubei Province, as well as their correlation with coping strategies

provide empirical supports for combating the secondary disasters of the pandemic, namely stigma and cyberbullying, that not only harm our mental health but also tear our world apart. The stigmatization experiences of Hubei residents in China could be identical with those of Asians or people from major epidemic areas in other parts of the world (World Health Organization, 2020). It is suggested that governments, mental health services, and mass media should work together to encourage college students to avoid emotional coping style and to adopt more positive coping strategies that deal directly with the source of the stress, in order to alleviate the behavioral and emotional consequences of the COVID-19 pandemic.

**Data Availability** The datasets generated during and/or analyzed during the current study are not publicly available due to the requirement of the sponsor but are available from the corresponding author on reasonable request.

## Declarations

**Conflict of Interest** None.

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