ORIGINAL ARTICLE

WILEY

Anxiety, depression and cognitive emotion regulation strategies in Chinese nurses during the COVID-19 outbreak

Qing-Qing Wang MSN, RN[1] | Yuan-Yuan Fang BSN, RN[2] | Hao-Lian Huang BSN, RN[1] | Wen-Jun Lv BSN, RN[1] | Xiao-Xiao Wang MSN, RN[1] | Tian-Ting Yang BSN, RN[1] | Jing-Mei Yuan BSN, RN[3] | Ying Gao BSN, RN[4] | Rui-Lian Qian BSN, Associate Professor[1] (iD) | Yan-Hong Zhang BSN, Associate Professor[1]

[1]Department of Nursing, Nanjing Brain Hospital, Brain Hospital Affiliated to Nanjing Medical University, Nanjing, China

[2]Nanjing Brain Hospital, Brain Hospital Affiliated to Nanjing Medical University, Nanjing, China

[3]Department of Nursing Research, Nanjing Brain Hospital, Brain Hospital Affiliated to Nanjing Medical University, Nanjing, China

[4]Department of Medical Psychology, Nanjing Brain Hospital, Brain Hospital Affiliated to Nanjing Medical University, Nanjing, China

Correspondence
Rui-Lian Qian, Department of Nursing, Nanjing Brain Hospital, Nanjing Medical University Affiliated Brain Hospital, 264 Guangzhou Road, Nanjing 210029, Jiangsu, China.
Email: ruilianqian@outlook.com

Abstract

Aims: To explore the association between cognitive emotion regulation strategies and anxiety and depression among nurses during the COVID-19 outbreak.

Background: Nurses play a vital role in responding to the COVID-19 outbreak, but many of them suffer from psychological problems due to the excessive workload and stress. Understanding the correlation between cognitive emotion regulation strategies and anxiety and depression will promote targeted psychosocial interventions for these affected nurses.

Methods: This cross-sectional study of 586 nurses was conducted in Eastern China. Participants completed online questionnaires that investigated anxiety, depression and cognitive emotion regulation strategies.

Results: The prevalence of nurses' anxiety and depression was 27.6% and 32.8%, respectively. Lower self-blame, rumination and catastrophizing, as well as greater acceptance and positive refocusing, were related to fewer symptoms of anxiety or depression.

Conclusion: The cognitive emotion regulation strategies of acceptance and positive refocusing contribute to reducing anxiety or depression. These strategies should be considered when implementing psychotherapeutic interventions to improve nurses' adverse emotional symptoms.

Implications for Nursing Management: This study highlights the need to assess cognitive emotion regulation strategies use in screening for anxiety and depression. Nurse managers should develop psychosocial interventions including appropriate strategies to help nurses with adverse emotions during a pandemic.

KEYWORDS

anxiety, cognitive emotion regulation, COVID-19, depression

Qing-Qing Wang, Yuan-Yuan Fang, Rui-Lian Qian, and Yan-Hong Zhang contributed equally to the work.

---

1 | BACKGROUND

The coronavirus disease 2019 (COVID-19) is an acute respiratory infectious disease, which has been reported in late 2019 in Wuhan, Hubei province, China (Wang et al., 2020). This disease spread quickly and triggered a global pandemic (Zu et al., 2020). In January 2020, the World Health Organization declared the COVID-19 outbreak a Public Health Emergency of International Concern (PHEIC) (WHO, 2020). As the number of confirmed cases and affected areas continues to increase, and the future of this outbreak is unpredictable, people may experience negative emotions, such as anxiety, depression and panic (Bao et al., 2020). These adverse emotions in turn could have negative effects on people's health and life.

Many studies have reported that health care workers are at risk of experiencing negative mental symptoms in the pandemic (Matsuishi et al., 2012; Naushad et al., 2019). Lung et al. (2009) found that 17.3% of the health care workers had significant anxiety and depression in the severe acute respiratory syndrome (SARS) epidemic. Matsuishi et al. (2012) also reported that nurses felt more anxiety about infection than medical doctors in the H1N1 pandemic. Currently, the COVID-19 pandemic has created a severe burden on health care systems and health care workforce. In China, many teams of doctors and nurses were sent to the affected areas, such as Hubei province. Nurses make up the largest proportion of frontline health care workers and play a key role in responding to PHEIC. They provide clinical care, disease screening and triage, and psychological counselling in hospitals and communities (Veenema et al., 2019). However, nurses are also concerned about infection and are not adequately prepared to deal with excessive workload and stress, which could lead to some common psychological problems (Zu et al., 2020). A study reported that several mental symptoms among nurses persisted 6 years after the 2008 Sichuan earthquake (Liao et al., 2019). Although there are studies on the mental health of the general public and health care workers during a pandemic, only a few have focused on the nurses themselves (Nukui et al., 2018; Sato et al., 2019).

Cognitive emotion regulation is the consciously cognitive way of regulating individuals' emotions or modifying the event itself, so as to help individuals manage their feelings and prevent them from being overwhelmed (Mocan et al., 2018; Slanbekova et al., 2019). There are four maladaptive strategies (self-blame, rumination, catastrophizing and blaming others) and five adaptive strategies (acceptance, positive refocusing, refocus on planning, positive reappraisal and putting into perspective) (Garnefski et al., 2001). Self-blame is the thought to blame yourself for something you have undergone; rumination is to think about feelings and thoughts of adverse events; catastrophizing is to overemphasize the terror of experiences; blaming others includes ideas of blaming others for your own problems; acceptance means accepting your experience and what has happened; positive refocusing is thinking of happy and enjoyable things rather than actual events; refocus on planning is considering practical steps to solve negative events; positive reappraisal means giving positive meanings to stressful events in the aspect of growth; and

putting into perspective is to downplay the seriousness of events (Garnefski et al., 2001). Studies have reported that specific cognitive emotion regulation strategies that persons habitually use during adverse or stressful events are associated with adverse emotional outcomes (Mocan et al., 2018; Sakakibara & Kitahara, 2016). A meta-analysis showed that maladaptive strategies have a positive relation to both anxiety and depression (Sakakibara & Kitahara, 2016). Mocan et al. (2018) found that reduced positive reappraisal and higher catastrophizing increased the presence of depression in diabetic patients. The global outbreak of COVID-19 is a catastrophic life event, and nurses accustomed to using maladaptive cognitive regulation strategies are more likely to trigger adverse emotional symptoms. However, which cognitive emotion regulation strategies are related to anxiety and depression in nurses during a health crisis has not been adequately considered.

In addition, many studies have explored the association between cognitive emotion regulation strategies and anxiety or depressive symptoms, but most of them have conducted in adolescents, patients and older adults, not nurses (Garnefski & Kraaij, 2018; Mocan et al., 2018; Spinhoven et al., 2017). Although there have been many significant disasters in China, research on nurses' mental health in a health crisis is still limited. Understanding the correlation between cognitive emotion regulation strategies and anxiety and depression in nurses during the COVID-19 outbreak is important for promoting the early identification of adverse emotions and developing psychological interventions to enable them to participate in future events.

Our aims were to explore: (1) the prevalence of anxiety and depression among Chinese nurses, (2) differences among groups distinguished by levels of anxiety/depression on cognitive emotion regulation strategies and (3) cognitive emotion regulation strategies and other related factors influencing anxiety and depression among nurses during the COVID-19 outbreak.

2 | METHODS

2.1 | Design

We designed a cross-sectional survey using self-report online questionnaires.

2.2 | Setting and sample

Our research was conducted in Nanjing, Jiangsu Province, eastern China, from 14 February to 3 March 2020. Considering the policy of reducing face-to-face contact and communication in the COVID-19 outbreak, we chose a cross-sectional online survey to ensure that participants could easily complete the questionnaires in 10 min. We calculated sample size using the formula: $N = \mu_\alpha^2 \times \pi (1 - \pi) / \delta^2$ (π = the prevalence of anxiety or depression, π = 43.4% (Gao et al., 2012); $\mu_\alpha = 1.96$, $\delta = 0.05$), and the minimum sample size was 378. Considering 20% nonresponse rates, the total sample size was

454. By convenience sampling, potential nurses living in Nanjing were invited to participate. Inclusion criteria were nurses who: (1) had registered nurse licences; (2) worked in their hospitals for at least 6 months; and (3) agreed to take part in our study. Nurses who were on leave, having severe somatic disease, and clinically diagnosed with psychiatric disorders were excluded.

2.3 | Ethical approval

Our study obtained approval from the relevant hospital research ethics committee and was carried out in accordance with the Helsinki Declaration. Each participant received survey pages by WeChat, including the study introduction, contact information of researchers, an electronic informed consent and a URL for the questionnaires. Participants could only move on to the next page after they had signed informed consent. To ensure the reliability of the test data, participants were also informed that they would receive a personal report on the interpretation of all scales and coping strategies after completing the investigation.

2.4 | Measures

2.4.1 | Demographic characteristics

Demographic characteristics included age, gender, marital status, number of children, education level, years of working, professional level (N0-N4, higher numbers represent higher professional levels), income, living condition, shift work, departments, support hospitals in Hubei province and encounter major life events in the past 6 months.

2.4.2 | Anxiety symptoms

Generalized Anxiety Disorder Scale-7 (GAD-7) consisting of 7 items is a self-report instrument to assess generalized anxiety disorder (Spitzer et al., 2006). Every item uses a four-point scale from 0 ('not at all') to 3 ('nearly every day'). Four levels of anxiety are divided: minimal (0–4), mild (5–9), moderate (10–14) and severe (15–21) (Spitzer et al., 2006). The Chinese version of GAD-7 was used (Cronbach's $\alpha = 0.898$) (He et al., 2010), and the alpha coefficient was 0.942.

2.4.3 | Depressive symptoms

Depression was assessed with Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001). This 9-item scale ranging from 0 to 27 is developed on the basis of the criteria of depression in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)

(American Psychiatric Association, 2000). Every item uses a 4-point scale (0 = 'not at all' to 3 = 'nearly every day'). This scale can be explained as follows: 0–4, 5–9, 10–14, 15–19 and 20 or higher represents no, mild, moderate, moderately severe and severe depressive symptoms, respectively (Kroenke et al., 2001). The Cronbach's α of 0.92 was shown in our study, which was similar to the alpha coefficient of 0.87 in the original Chinese study (Arroll et al., 2010).

2.4.4 | Cognitive emotion regulation

Cognitive Emotional Regulation Questionnaire (CERQ) was developed to measure cognitive emotion regulation strategies employed to deal with threatening or stressful life events (Garnefski et al., 2001, 2002). The 36-item questionnaire contains nine conceptually distinct subscales: self-blame, rumination, catastrophizing, blaming others, acceptance, positive refocusing, refocus on planning, positive reappraisal and putting into perspective (Garnefski et al., 2001). Each 4-item subscale uses a 5-point Likert scale (1 = 'almost never' to 5 = 'almost always'), and a lower subscale score indicates less engagement of the specific strategy. The Cronbach's α of CERQ ranges from 0.67 to 0.81 (Garnefski et al., 2001). The Chinese version of CERQ (CERQ-C) has also demonstrated acceptable reliability and validity (Zhu et al., 2007). In our study, alpha coefficients were between 0.84 and 0.98.

2.5 | Data collection procedures

Researchers telephoned each hospital's nursing supervisors explaining the purpose of our study and inviting them to promote our research among nurses. Our online survey was conducted using the 'Sojump' questionnaire solution (www.sojump.com), and anonymous questionnaires were sent to participants via WeChat. Finally, 624 eligible nurses agreed to participate, and 595 (95.4%) responded to the questionnaires. After all questionnaires were checked by investigators, a total of 586 questionnaires without missing answers/outliers were analysed.

2.6 | Data analysis

All statistical analysis was used by IBM SPSS Statistics Version 22.0 for Windows (IBM Corporation, New York, NY, USA). Using the cut-off score of 5 in GAD-7 and PHQ-9, we classified nurses into two groups: nurses who had anxiety/depression (GAD-7 ≥ 5 or PHQ-9 ≥ 5) and nurses who did not (GAD-7 < 5 or PHQ-9 < 5). Independent t test, chi-squared and Fisher's exact tests were conducted to compare the differences in demographic characteristics and CERQ-C scores between the two groups. A forward-stepwise binary logistic regression was utilized to identify significant risk factors for nurses' anxiety and depressive symptoms with odds ratios

TABLE 1 Demographic characteristics and cognitive emotional regulation in nurses grouped by anxiety symptoms [$n = 586$, Mean $\pm$ SD, n (%)]

Variables	Total	Anxiety symptoms n (%)		t/χ^2	p
		No (n = 424)	Yes (n = 162)		
Age (Mean $\pm$ SD; years)	31.07 $\pm$ 7.54	30.76 $\pm$ 7.64	31.87 $\pm$ 7.24	−1.59	.11[†]
Gender				0.42	.64[‡]
Male	23 (3.92)	18 (4.25)	5 (3.09)		
Female	563 (96.08)	406 (95.75)	157 (96.91)		
Marital status				4.63	.09[‡]
Single	224 (38.22)	172 (40.57)	52 (32.10)		
Married	353 (60.24)	247 (58.25)	106 (65.43)		
Divorced	9 (1.54)	5 (1.18)	4 (2.47)		
Number of children				7.50	.02[‡]
None	283 (48.29)	219 (51.65)	64 (39.51)		
1	257 (43.86)	176 (41.51)	81 (50.00)		
≥2	46 (7.85)	29 (6.84)	17 (10.49)		
Educational level				11.82	.002[‡]
Associate degree or below	116 (19.80)	97 (22.88)	19 (11.73)		
Bachelor's degree	465 (79.35)	325 (76.65)	140 (86.42)		
Master's degree or higher	5 (0.85)	2 (0.47)	3 (1.85)		
Years of working				14.81	.001[‡]
<5	130 (22.18)	111 (26.18)	19 (11.73)		
5–10	243 (41.47)	163 (38.44)	80 (49.38)		
>10	213 (36.35)	150 (35.38)	63 (38.89)		
Professional level				9.97	.07[‡]
N0	48 (8.19)	39 (9.20)	9 (5.56)		
N1	153 (26.11)	114 (26.89)	39 (24.07)		
N2	202 (34.47)	149 (35.14)	53 (32.72)		
N3	140 (23.89)	88 (20.75)	52 (32.10)		
N4	18 (3.07)	13 (3.07)	5 (3.08)		
Other	25 (4.27)	21 (4.95)	4 (2.47)		
Income (RMB/month)				5.40	.07[‡]
<5,000 (705.87 USD)	46 (7.85)	39 (9.20)	7 (4.32)		
5,000–10,000 (705.87–1,411.73 USD)	465 (79.35)	336 (79.25)	129 (79.63)		
>10,000 (1,411.73 USD)	75 (12.80)	49 (11.55)	26 (16.05)		
Living condition				9.83	.01[‡]
Living alone/isolation	46 (7.85)	29 (6.84)	17 (10.49)		
Living with others	88 (15.02)	75 (17.69)	13 (8.03)		
Living with family	452 (77.13)	320 (75.47)	132 (81.48)		
Shift work				9.41	.01[‡]
Regular day shift	172 (29.35)	139 (32.78)	33 (20.37)		
Night shift (≤1/week)	153 (26.11)	109 (25.71)	44 (27.16)		
Night shift (≥2/week)	261 (44.54)	176 (41.51)	85 (52.47)		
Departments				10.52	.01[‡]
General ward	477 (81.40)	355 (83.72)	122 (75.31)		
Emergency/outpatient triage	15 (2.56)	6 (1.42)	9 (5.56)		
Fever outpatient	6 (1.02)	3 (0.71)	3 (1.85)		

(Continues)

TABLE 1 (Continued)

Variables	Total	Anxiety symptoms n (%)		t/χ²	p
		No (n = 424)	Yes (n = 162)		
Isolation ward	88 (15.02)	60 (14.15)	28 (17.28)		
Support hospitals in Hubei province				23.07	<.001‡
No	551 (94.03)	411 (96.93)	140 (86.42)		
Yes	35 (5.97)	13 (3.07)	22 (13.58)		
Encounter major life events in the past six months				16.08	<.001‡
No	558 (95.22)	413 (97.41)	145 (89.51)		
Yes	28 (4.78)	11 (2.59)	17 (10.49)		
CERQ-C score (subscales, Mean ± SD)					
Self-blame	7.80 ± 3.54	6.94 ± 3.23	10.05 ± 3.33	−10.33	<.001†
Acceptance	11.12 ± 5.15	11.66 ± 5.11	9.73 ± 5.01	4.10	<.001†
Rumination	8.91 ± 3.66	7.98 ± 3.43	11.32 ± 3.12	−11.26	<.001†
Positive refocusing	10.46 ± 4.22	10.85 ± 4.16	9.46 ± 4.21	3.61	<.001†
Refocus on planning	11.88 ± 4.46	12.21 ± 4.29	11.02 ± 4.78	2.76	.01†
Positive reappraisal	13.03 ± 4.12	13.03 ± 4.50	13.02 ± 2.91	0.03	.98†
Putting into perspective	7.91 ± 3.27	8.05 ± 3.15	7.54 ± 3.57	1.59	.11†
Catastrophizing	7.67 ± 3.35	6.61 ± 2.86	10.45 ± 2.92	−14.46	<.001†
Blaming others	8.02 ± 3.39	7.34 ± 3.23	9.81 ± 3.14	−8.36	<.001†

Abbreviation: CERQ-C, the Chinese version of Cognitive Emotion Regulation Questionnaire.

†p-value of independent samples t-test among two groups.

‡p-value of χ^2/Fisher's exact test among two groups.

(OR) and 95% confidence intervals (CIs). $p < .05$ was established as statistically significant.

3 | RESULTS

3.1 | Demographic characteristics and the prevalence of anxiety and depression among the study sample

In Tables 1 and 2, we collected data from 23 male and 563 female nurses, with a mean age of 31.07 ± 7.54 years (range 20–55). 162 nurses presented anxiety symptoms, including 20.82% with mild anxiety and 6.83% with moderate or severe anxiety; 192 nurses reported depressive symptoms, including 21.67% with mild depression and 11.09% with a moderate or above level of depression.

3.2 | Comparison of CERQ-C scores between groups by anxiety symptoms

Table 1 showed the comparison of CERQ-C scores between the two nurses groups. Nurses with anxiety symptoms had significantly lower subscale scores for acceptance, positive refocusing and refocus on planning (all $p < .05$), and higher scores for four maladaptive

strategies when compared with nurses who had no anxiety (all $p < .001$).

3.3 | Comparison of CERQ-C scores between groups by depressive symptoms

In Table 2, subscale scores for adaptive strategies except positive reappraisal and putting into perspective were lower, and scores for four maladaptive strategies were higher among nurses with depressive symptoms than those without depressive symptoms (all $p < .05$).

3.4 | Binary logistic regression models for predicting cognitive emotion regulation strategies and other related factors for anxiety and depression

Prior to the analysis, we changed the categorical and ordinal variables into dummy variables and tested for multicollinearity. The variance inflation factor (VIF) values were all less than 3, indicating no collinearity (Mansfield & Helms, 1982). In the forward-stepwise binary logistic regression analysis, the two groups were tested as the dependent variable, and the variables with statistical significance in demographic characteristics and CERQ-C scores were used as independent variables. In Tables 3 and 4, the logistic regression models were significant,

TABLE 2 Demographic characteristics and cognitive emotional regulation in nurses grouped by depressive symptoms [n = 586, Mean ± SD, n (%)]

Variables	Total	Depressive symptoms n (%)		t/χ^2	p
		No (n = 394)	Yes (n = 192)		
Age (Mean ± SD; years)	31.07 ± 7.54	31.14 ± 7.72	30.93 ± 7.16	0.31	.76[†]
Gender				0.06	.83[‡]
Male	23 (3.92)	16 (4.06)	7 (3.65)		
Female	563 (96.08)	378 (95.94)	185 (96.35)		
Marital status				1.02	.60[‡]
Single	224 (38.22)	148 (37.56)	76 (39.58)		
Married	353 (60.24)	241 (61.17)	112 (58.34)		
Divorced	9 (1.54)	5 (1.27)	4 (2.08)		
Number of children				0.42	.83[‡]
None	283 (48.29)	192 (48.73)	91 (47.40)		
1	257 (43.86)	173 (43.91)	84 (43.75)		
≥2	46 (7.85)	29 (7.36)	17 (8.85)		
Educational level				2.82	.21[‡]
Associate degree or below	116 (19.80)	83 (21.07)	33 (17.19)		
Bachelor's degree	465 (79.35)	309 (78.42)	156 (81.25)		
Master's degree or higher	5 (0.85)	2 (0.51)	3 (1.56)		
Years of working				1.57	.46[‡]
<5	130 (22.18)	92 (23.35)	38 (19.79)		
5–10	243 (41.47)	157 (39.85)	86 (44.79)		
>10	213 (36.35)	145 (36.80)	68 (35.42)		
Professional level				12.49	.03[‡]
N0	48 (8.19)	35 (8.88)	13 (6.77)		
N1	153 (26.11)	97 (24.62)	56 (29.17)		
N2	202 (34.47)	145 (36.80)	57 (29.69)		
N3	140 (23.89)	82 (20.81)	58 (30.21)		
N4	18 (3.07)	14 (3.55)	4 (2.08)		
Other	25 (4.27)	21 (5.33)	4 (2.08)		
Income (RMB/month)				4.77	.09[‡]
<5,000 (705.87 USD)	46 (7.85)	37 (9.39)	9 (4.69)		
5,000–10,000 (705.87–1,411.73 USD)	465 (79.35)	304 (77.16)	161 (83.85)		
>10,000 (1,411.73 USD)	75 (12.80)	53 (13.45)	22 (11.46)		
Living condition				8.65	.01[‡]
Living alone/isolation	46 (7.85)	22 (5.58)	24 (12.50)		
Living with others	88 (15.02)	62 (15.74)	26 (13.54)		
Living with family	452 (77.13)	310 (78.68)	142 (73.96)		
Shift work				20.40	<.001[‡]
Regular day shift	172 (29.35)	139 (35.28)	33 (17.19)		
Night shift (≤1/week)	153 (26.11)	95 (24.11)	58 (30.21)		
Night shift (≥2/week)	261 (44.54)	160 (40.61)	101 (52.60)		
Departments				6.16	.09[‡]
General ward	477 (81.40)	323 (81.98)	154 (80.21)		
Emergency/outpatient triage	15 (2.56)	6 (1.52)	9 (4.69)		
Fever outpatient	6 (1.02)	3 (0.76)	3 (1.56)		

(Continues)

TABLE 2 (Continued)

Variables	Total	Depressive symptoms n (%)		t/χ²	p
		No (n = 394)	Yes (n = 192)		
Isolation ward	88 (15.02)	62 (15.74)	26 (13.54)		
Support hospitals in Hubei province				12.53	.001[‡]
No	551 (94.03)	380 (96.45)	171 (89.06)		
Yes	35 (5.97)	14 (3.55)	21 (10.94)		
Encounter major life events in the past six months				7.93	.01[‡]
No	558 (95.22)	382 (96.95)	176 (91.67)		
Yes	28 (4.78)	12 (3.05)	16 (8.33)		
CERQ-C score (subscales, Mean ± SD)					
Self-blame	7.80 ± 3.54	6.79 ± 3.19	9.87 ± 3.33	−10.81	<.001[†]
Acceptance	11.12 ± 5.15	11.52 ± 5.13	10.31 ± 5.11	2.69	.01[†]
Rumination	8.91 ± 3.66	7.75 ± 3.34	11.29 ± 3.10	−12.65	<.001[†]
Positive refocusing	10.46 ± 4.22	10.87 ± 4.26	9.64 ± 4.01	3.33	.001[†]
Refocus on planning	11.88 ± 4.46	12.21 ± 4.42	11.19 ± 4.48	2.60	.01[†]
Positive reappraisal	13.03 ± 4.12	13.06 ± 4.59	12.95 ± 2.93	0.34	.73[†]
Putting into perspective	7.91 ± 3.27	7.95 ± 3.18	7.83 ± 3.46	0.38	.70[†]
Catastrophizing	7.67 ± 3.35	6.53 ± 2.85	10.00 ± 3.09	−13.44	<.001[†]
Blaming others	8.02 ± 3.39	7.11 ± 3.09	9.90 ± 3.20	−10.15	<.001[†]

Abbreviation: CERQ-C, the Chinese version of Cognitive Emotion Regulation Questionnaire.

[†]p-value of independent samples t test among two groups.

[‡]p-value of χ^2/Fisher's exact test among two groups.

explaining 54.7% and 52.3% in the variance of anxiety and depression, and correctly classified 84.6% and 82.6% cases, respectively. As seen in Table 3, the likelihood of experiencing anxiety symptoms increased with more frequent use of self-blame (OR = 1.25, $p \leq .001$), rumination (OR = 1.18, $p = .003$) and catastrophizing (OR = 1.31, $p \leq .001$), as well as less use of acceptance (OR = 0.80, $p \leq .001$). Additionally, increased years of working (>5), encountering major life events and working in emergency/outpatient triage and isolation ward were found to be risk factors for experiencing anxiety.

In Table 4, lower acceptance (OR = 0.90, $p = .005$) and positive refocusing (OR = 0.85, $p \leq .001$), as well as increased self-blame (OR = 1.16, $p \leq .001$), rumination (OR = 1.36, $p \leq .001$) and catastrophizing (OR = 1.18, $p \leq .001$), were significant independent predictors for depression. More night shifts predicted more depressive symptoms. Meanwhile, living with others or family were revealed as significant protective factors against depressive symptoms.

4 | DISCUSSION

The prevalence of anxiety and depression among nurses was 27.6% and 32.8% during the COVID-19 outbreak, respectively. Some public health disaster studies reported lower or higher prevalence rates than those found in our study (Bai et al., 2004; Huang et al., 2020; Nickell et al., 2004). Two studies of the 2003 SARS outbreak reported that 14% of nurses and physicians in Taiwan experienced anxiety, and 45% of nurses in Toronto had depression (Bai et al., 2004; Nickell et al., 2004). Huang et al. (2020) have estimated that the incidence of anxiety in Chinese nurses was 26.88% during the COVID-19 epidemic, which is similar to our results. Nurses are the largest component of any disaster responders, and as the global health crises like COVID-19 become more frequent and severe, their work performance and psychological status will be critical to the success of the response to the outbreak (Veenema & Thornton, 2015). However, previous studies have shown that nurses had higher levels of negative emotions, such as anxiety and depression, than physicians in a crisis situation (Matsuishi et al., 2012; Naushad et al., 2019). Nurses who spend more time with patients may be more likely to develop emotional bonds with them than doctors (Naushad et al., 2019). For example, nurses may experience adverse emotions when caring for individuals who are severely ill, feeling stressed or experiencing bereavement (Bao et al., 2020). In addition, nurses also have their own concerns about virus infections and health risks to family members, which could become a mental burden for them (Nukui et al., 2018). Although the role of nurses in relief work has already been studied, their own mental health has not been fully considered (von Strauss et al., 2017; Veenema et al., 2019). Our study notes that the prevalence of nurses' anxiety and depression during the outbreak is relatively high to warrant concern.

Variables	*B*	*SE*	Odd ratio (OR)	95% confidence interval (CI) for OR	
				Lower	Upper
Years of working					
<5			1.00		
5–10	1.20	0.37	3.33***	1.63	6.83
>10	0.92	0.38	2.51*	1.18	5.32
Encounter major life events in the past six months					
No			1.00		
Yes	1.44	0.55	4.20**	1.44	12.29
Support hospitals in Hubei province					
No			1.00		
Yes	0.99	0.63	2.70	0.79	9.18
Shift work					
Regular day shift			1.00		
Night shift (≤1/week)	0.10	0.36	1.10	0.55	2.21
Night shift (≥2/week)	0.32	0.33	1.38	0.72	2.66
Departments					
General ward			1.00		
Emergency/outpatient triage	1.84	0.70	6.30**	1.59	24.88
Fever outpatient	1.02	1.15	2.76	0.29	26.47
Isolation ward	0.71	0.36	2.04*	1.02	4.10
Self-blame	0.22	0.05	1.25***	1.13	1.37
Acceptance	−0.22	0.04	0.80***	0.75	0.86
Rumination	0.16	0.05	1.18**	1.06	1.31
Catastrophizing	0.27	0.05	1.31***	1.19	1.45

*p-value < .05.
**p-value ≤ .01.
***p-value ≤ .001.

The cognitive emotion regulation strategies adopted by nurses affect their ability to control emotions, mental health and work performance (Garnefski & Kraaij, 2018; Salvarani et al., 2019). Our study focused on the association between cognitive emotion regulation strategies and nurses' anxiety and depression during the COVID-19 outbreak. The logistic regression analysis showed that more engagement of maladaptive strategies (self-blame, rumination and catastrophizing) predicted anxiety and depressive symptoms. These findings are supported by those reported in the earlier studies (Garnefski & Kraaij, 2018; Sakakibara & Kitahara, 2016). Self-blame means a sense of regret. When faced with a patient's death, nurses might reflect on their behaviour and developed self-judgment, which made them trapped in regretful moods, leading to anxiety and depression (Cheng & Lin, 2016; Slanbekova et al., 2019). The positive correlation between rumination and symptoms of anxiety and depression has been extensively studied in adults and adolescents (McLaughlin & Nolen-Hoeksema, 2011; Stikkelbroek et al., 2016), but is rarely reported among nurses. Our study found that rumination was the most important factor in nurses' depression. People try to understand the causes and consequences of events via rumination to avoid

further disasters. But these thoughts are often abstract and focused on the problem itself because of inadequate problem-solving or emotional processing (Görgen et al., 2014). Current research has shown that mindfulness improves the abilities of concrete thinking and increases the absorption of current experience, thus reducing the effects of rumination on anxiety and depression (Desrosiers et al., 2013). Catastrophizing was the most important correlates of anxiety, which was also confirmed in Garnefski and Kraaij (2018)'s study. In nurses, catastrophizing refers to exaggerating threat-related concerns, emphasizing the worry of working in a difficult or suffering situation and the need to manage it. In addition, our results showed that acceptance was inversely related to anxiety and depression. A similar finding was showed in Zhao et al. (2013)'s study, which reported the negative correlation between acceptance and nurses' depression. However, more studies have not reported this significant association. Although acceptance is a common objective in several psychotherapies, for example, dialectical behaviour therapy, it may play different roles in the process of solving stressful life events (Stikkelbroek et al., 2016). Current research on acceptance may differ from previous results due to differences in the timing of

crises, population and measurement scales (Desrosiers et al., 2013). Future studies should consider these factors and explore how they differ in relation to negative emotional symptoms. Positive refocusing was also found to be associated with lower depression. The relationship between positive refocusing and depression was in line with prior research on women (Wang et al., 2014). Therefore, our findings suggest that psychotherapeutic interventions containing adaptive strategies, such as acceptance and positive refocusing, may help to improve nurses' anxiety and depression in catastrophic or stressful events.

In this study, increased years of working (>5), encountering major life events in the past 6 months and working in emergency/outpatient triage and isolation ward were also found to be positively related to anxiety. Previous research showed that Chinese nurses with longer years of working were more prone to anxiety (Li et al., 2016). But other studies conducted in Greece and Australian nurses showed little evidence on this finding (Karanikola et al., 2016; Maharaj et al., 2019). Gao et al. (2012) reported that major life events like death and major disease were associated with nurses' anxiety, but this factor did not contribute significantly to the final logistic analysis, which was contrary to our results. Further research is required to explore such differences in health crises. Similar to our study, published literature has suggested that individuals working in high-risk departments like emergency and isolation wards are at a higher risk of experiencing adverse emotions during the outbreak (Matsuishi et al., 2012; Naushad et al., 2019). Therefore, the psychosocial state of these staff is worthy of concern. Moreover, more night shifts were related to developing depression, which is

TABLE 4 Binary logistic regression analysis for variables predicting depressive symptoms

Variables	B	SE	Odd ratio (OR)	95% confidence interval (CI) for OR Lower	Upper
Professional level					
N0			1.00		
N1	−0.09	0.47	0.91	0.36	2.32
N2	−0.68	0.51	0.51	0.19	1.37
N3	0.32	0.50	1.38	0.51	3.72
N4	−0.84	0.91	0.43	0.07	2.57
Other	−0.86	0.83	0.42	0.08	2.16
Living condition					
Living alone/ isolation			1.00		
Living with others	−1.21	0.50	0.30[*]	0.11	0.80
Living with family	−0.95	0.43	0.39[*]	0.17	0.89
Encounter major life events in the past six months					
No			1.00		
Yes	1.01	0.56	2.75	0.92	8.18
Support hospitals in Hubei province					
No			1.00		
Yes	0.22	0.62	1.25	0.37	4.23
Shift work					
Regular day shift			1.00		
Night shift (≤1/ week)	0.74	0.33	2.09[*]	1.09	4.02
Night shift (≥2/ week)	1.08	0.32	2.95[***]	1.56	5.55
Self-blame	0.15	0.04	1.16[***]	1.06	1.26
Acceptance	−0.10	0.04	0.90[**]	0.84	0.97
Rumination	0.30	0.05	1.36[***]	1.22	1.51
Positive refocusing	−0.16	0.05	0.85[***]	0.78	0.93
Catastrophizing	0.17	0.04	1.18[***]	1.08	1.29

*p-value < .05.

**p-value ≤ .01.

***p-value ≤ .001.

consistent with that reported in prior studies (Bukhari et al., 2019; Cheung & Yip, 2016). In addition, living with others or family was found to be negatively associated with depression. Nurses might receive support from peers and family members to help them handle pressure and emotional disturbance during the outbreak (Naushad et al., 2019).

This study had several limitations. First, the cross-sectional design could not identify the causality of related factors. The association between cognitive emotion regulation strategies and adverse emotions over time could be explored in future longitudinal studies. Second, our study relied on nurses' self-reporting, and their attitudes may affect the reliability of self-report questionnaires. Lastly, our target sample was limited to one region of China, and the findings may not be applicable to other populations and regions. Despite these limitations, the advantage of our study is that it attempts to explore the cognitive emotion regulation strategies contributing to nurses' anxiety and depression during the period of the highest incidence and mortality of COVID-19 cases in China.

5 | CONCLUSION

This study evaluated the prevalence of nurses' anxiety and depression in the COVID-19 outbreak and explored the association between cognitive emotion regulation strategies and their adverse emotions. More frequently engagement of self-blame, rumination and catastrophizing, as well as less engagement of acceptance and positive refocusing, were associated with more anxiety or depressive symptoms. In addition, years of working, major life events, departments, shift work and living conditions were also related to anxiety or depression. These findings highlight the necessity of assessing the psychosocial state of nurses and the use of cognitive emotion regulation strategies during a pandemic. Moreover, using appropriate cognitive emotion regulation strategies can be part of interventions to improve nurses' anxiety and depressive symptoms.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Nurses constitute the largest proportion of the workforce coping with PHEIC. Given the high prevalence of anxiety and depression among nurses during the epidemic, screening for adverse emotional symptoms and evaluating their cognitive emotion regulation strategies use could be important in the future. Our findings can be used as part of psychotherapeutic interventions/treatments (e.g. Mindfulness and Acceptance and Commitment Therapy) to help nurses improve negative emotions in a pandemic condition. For example, in the case of anxiety, it might be suggested that maladaptive strategies such as self-blame, rumination and catastrophizing should be reduced, while the more adaptive strategies like acceptance should be taught. In the case of depression, the adaptive strategies of acceptance and positive refocusing should be selected and applied.

AUTHOR CONTRIBUTIONS
Qing-Qing Wang, Yuan-Yuan Fang, Hao-Lian Huang, Wen-Jun Lv, Xiao-Xiao Wang, Tian-Ting Yang, Jing-Mei Yuan, Yan-Hong Zhang and Rui-Lian Qian made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; Qing-Qing Wang and Rui-Lian Qian involved in drafting the manuscript or revising it critically for important intellectual content and given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ETHICAL APPROVAL
Our study obtained approval from the ethics committee of Nanjing Medical University Affiliated Brain Hospital (No. 2020-KY010-01) and carried out in accordance with the Helsinki Declaration. Each participant received survey pages including the aims of the study, contact information of researchers and online informed consent by WeChat. After reading the study information and signing informed consent, respondents entered the survey by clicking on the designated link to the anonymous questionnaires. In order to ensure test data reliable, participants were also told that they would receive a personal report on all scales' status and coping strategies after completing the investigation. All collected data were de-identified and only used for this research.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID
Rui-Lian Qian https://orcid.org/0000-0001-6798-4110

REFERENCES
American Psychiatric Association (2000). *American Psychiatric Association diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC.
Arroll, B., Goodyear-Smith, F., Crengle, S., Gunn, J., Kerse, N., Fishman, T., Falloon, K., & Hatcher, S. (2010). Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. *Annals of Family Medicine*, *8*(4), 348–353. https://doi.org/10.1370/afm.1139

Bai, Y., Lin, C. C., Lin, C. Y., Chen, J. Y., Chue, C. M., & Chou, P. (2004). Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatric Services*, *55*(9), 1055–1057. https://doi.org/10.1176/appi.ps.55.9.1055

Bao, Y., Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-nCoV epidemic: Address mental health care to empower society. *The Lancet*, *395*, e37–e38. https://doi.org/10.1016/S0140-6736(20)30309-3

Bukhari, G. M. J., Habibullah, S., Abbasi, M. M. J., & Malik, J. S. (2019). Occupational factors associated with depression in nurses working in a federal government tertiary care hospital in Islamabad. *Journal of Ayub Medical College Abbottabad*, *31*(3), 397–401.

Cheng, Y., & Lin, Y.-C. (2016). Regret and psychological adjustment: An examination of the dual-route mediating effect of self-compassion and self-judgment. *Bulletin of Educational Psychology*, *48*, 77–89. https://doi.org/10.6251/BEP.20150925

Cheung, T., & Yip, P. (2016). Lifestyle and depression among Hong Kong nurses. *International Journal of Environmental Research and Public Health*, *13*, 135. https://doi.org/10.3390/ijerph13010135

Desrosiers, A., Vine, V., Klemanski, D. H., & Nolen-Hoeksema, S. (2013). Mindfulness and emotion regulation in depression and anxiety: Common and distinct mechanisms of action. *Depression and Anxiety*, *30*(7), 654–661. https://doi.org/10.1002/da.22124

Gao, Y., Pan, B., Sun, W., Wu, H., Wang, J., & Wang, L. (2012). Anxiety symptoms among Chinese nurses and the associated factors: A cross sectional study. *BMC Psychiatry*, *12*, 141. https://doi.org/10.1186/1471-244X-12-141

Garnefski, N., & Kraaij, V. (2018). Specificity of relations between adolescents' cognitive emotion regulation strategies and symptoms of depression and anxiety. *Cognition and Emotion: Special Issue on Anxiety and Depression*, *32*(7), 1401–1408. https://doi.org/10.1080/02699931.2016.1232698

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*, *30*(8), 1311–1327. https://doi.org/10.1016/S0191-8869(00)00113-6

Garnefski, N., Kraaij, V., & Spinhoven, P. (2002). *CERQ: Manual for the use of the Cognitive Emotion Regulation Questionnaire*. DATEC.

Görgen, S. M., Hiller, W., & Witthöft, M. (2014). Health anxiety, cognitive coping, and emotion regulation: A latent variable approach. *International Journal of Behavioral Medicine*, *21*(2), 364–374. https://doi.org/10.1007/s12529-013-9297-y

He, X. Y., Li, C. B., Qian, J., Cui, H. S., & Wu, W. Y. (2010). Reliability and validity of a generalized anxiety disorder scale in general hospital outpatients. *Shanghai Archives of Psychiatry*, *22*(4), 200–203. https://doi.org/10.3969/j.issn.1002-0829.2010.04.002

Huang, J. Z., Han, M. F., Luo, T. D., Ren, A. K., & Zhou, X. P. (2020). Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Chinese Journal of Industrial Hygiene and Occupational Diseases*, *38*(3), 192–195. https://doi.org/10.3760/cma.j.cn121094-20200219-00063

Karanikola, M. N. K., Giannakopoulou, M., Kalafati, M., Kaite, C. P., Patiraki, E., Mpouzika, M., Papathanassoglou, E. E. D., & Middleton, N. (2016). Anxiety symptoms and quality of interaction among oncology nurses: A correlational, cross-sectional study. *Revista Da Escola De Enfermagem Da USP*, *50*(5), 800–807. https://doi.org/10.1590/S0080-623420160000600013

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Li, S., Li, L., Zhu, X., Wang, Y., Zhang, J., Zhao, L., Li, L., & Yang, Y. (2016). Comparison of characteristics of anxiety sensitivity across career stages and its relationship with nursing stress among female nurses in Hunan, China. *British Medical Journal Open*, *6*, e10829. https://doi.org/10.1136/bmjopen-2015-010829

Liao, J., Ma, X., Gao, B., Zhang, M., Zhang, Y., Liu, M., & Li, X. (2019). Psychological status of nursing survivors in China and its associated factors: 6 years after the 2008 Sichuan earthquake. *Neuropsychiatric Disease and Treatment*, *15*, 2301–2311. https://doi.org/10.2147/NDT.S203909

Lung, F. W., Lu, Y. C., Chang, Y. Y., & Shu, B. C. (2009). Mental symptoms in different health professionals during the SARS attack: A follow-up study. *Psychiatric Quarterly*, *80*(2), 107–116. https://doi.org/10.1007/s11126-009-9095-5

Maharaj, S., Lees, T., & Lal, S. (2019). Prevalence and risk factors of depression, anxiety, and stress in a cohort of Australian nurses. *International Journal of Environmental Research and Public Health*, *16*, 61. https://doi.org/10.3390/ijerph16010061

Mansfield, E. R., & Helms, B. P. (1982). Detecting multicollinearity. *The American Statistician*, *36*(3a), 158–160. https://doi.org/10.1080/00031305.1982.10482818

Matsuishi, K., Kawazoe, A., Imai, H., Ito, A., Mouri, K., Kitamura, N., Miyake, K., Mino, K., Isobe, M., Takamiya, S., Hitokoto, H., & Mita, T. (2012). Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe. *Psychiatry and Clinical Neurosciences*, *66*(4), 353–360. https://doi.org/10.1111/j.1440-1819.2012.02336.x

McLaughlin, K. A., & Nolen-Hoeksema, S. (2011). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour Research and Therapy*, *49*(3), 186–193. https://doi.org/10.1016/j.brat.2010.12.006

Mocan, A. S., Iancu, S. S., & Baban, A. S. (2018). Association of cognitive-emotional regulation strategies to depressive symptoms in type 2 diabetes patients. *Romanian Journal of Internal Medicine*, *56*(1), 34–40. https://doi.org/10.1515/rjim-2017-0037

Naushad, V. A., Bierens, J. J., Nishan, K. P., Firjeeth, C. P., Mohammad, O. H., Maliyakkal, A. M., ChaliHadan, S., & Schreiber, M. D. (2019). A systematic review of the impact of disaster on the mental health of medical responders. *Prehospital and Disaster Medicine*, *34*(6), 632–643. https://doi.org/10.1017/S1049023X19004874

Nickell, L. A., Crighton, E. J., Tracy, C. S., Al-Enazy, H., Bolaji, Y., Hanjrah, S., Hussain, A., Makhlouf, S., & Upshur, R. E. G. (2004). Psychosocial effects of SARS on hospital staff: Survey of a large tertiary care institution. *Canadian Medical Association Journal*, *170*(5), 793–798. https://doi.org/10.1503/cmaj.1031077

Nukui, H., Midorikawa, S., Murakami, M., Maeda, M., & Ohtsuru, A. (2018). Mental health of nurses after the Fukushima complex disaster: A narrative review. *Journal of Radiation Research*, *59*(suppl_2), ii108–ii113. https://doi.org/10.1093/jrr/rry023

Sakakibara, R., & Kitahara, M. (2016). The relationship between Cognitive Emotion Regulation Questionnaire (CERQ) and depression, anxiety: Meta-analysis. *Shinrigaku Kenkyu*, *87*(2), 179–185. https://doi.org/10.4992/jjpsy.87.15302

Salvarani, V., Rampoldi, G., Ardenghi, S., Bani, M., Blasi, P., Ausili, D., Di Mauro, S., & Strepparava, M. G. (2019). Protecting emergency room nurses from burnout: The role of dispositional mindfulness, emotion regulation and empathy. *Journal of Nursing Management*, *27*(4), 765–774. https://doi.org/10.1111/jonm.12771

Sato, H., Techasrivichien, T., Omori, A., Ono-Kihara, M., & Kihara, M. (2019). Psychosocial consequences among nurses in the affected area of the Great East Japan Earthquake of 2011 and the Fukushima complex disaster: A qualitative Study. *Disaster Medicine and Public Health Preparedness*, *13*, 519–526. https://doi.org/10.1017/dmp.2018.100

Slanbekova, G. K., Chung, M. C., Ayupova, G. T., Kabakova, M. P., Kalymbetova, E. K., & Korotkova-Ryckewaert, N. V. (2019). The relationship between posttraumatic stress disorder, interpersonal sensitivity and specific distress symptoms: The role of cognitive emotion regulation. *Psychiatric Quarterly*, *90*(4), 803–814. https://doi.org/10.1007/s11126-019-09665-w

Spinhoven, P., van der Veen, D. C., Voshaar, R. C. O., & Comijs, H. C. (2017). Worry and cognitive control predict course trajectories of

anxiety in older adults with late-life depression. *European Psychiatry*, *44*, 134–140. https://doi.org/10.1016/j.eurpsy.2017.05.002

Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Stikkelbroek, Y., Bodden, D. H. M., Kleinjan, M., Reijnders, M., & van Baar, A. L. (2016). Adolescent depression and negative life events, the mediating role of cognitive emotion regulation. *PLoS One*, *11*(8), e161062. https://doi.org/10.1371/journal.pone.0161062

Veenema, T. G., Burkle, F. M., & Dallas, C. E. (2019). The nursing profession: A critical component of the growing need for a nuclear global health workforce. *Conflict and Health*, *13*, 9. https://doi.org/10.1186/s13031-019-0197-x

Veenema, T. G., & Thornton, C. P. (2015). Understanding nursing's role in health systems response to large-scale radiologic disasters. *Journal of Radiology Nursing*, *34*(2), 63–72. https://doi.org/10.1016/j.jradnu.2014.11.005

von Strauss, E., Paillard-Borg, S., Holmgren, J., & Saaristo, P. (2017). Global nursing in an Ebola viral haemorrhagic fever outbreak: Before, during and after deployment. *Global Health Action*, *10*, 1371427. https://doi.org/10.1080/16549716.2017.1371427

Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel coronavirus outbreak of global health concern. *Lancet*, *395*(10223), 470–473. https://doi.org/10.1016/S0140-6736(20)30185-9

Wang, Y., Yi, J., He, J., Chen, G., Li, L., Yang, Y., & Zhu, X. (2014). Cognitive emotion regulation strategies as predictors of depressive symptoms in women newly diagnosed with breast cancer. *Psycho-Oncology*, *23*, 93–99. https://doi.org/10.1002/pon.3376

World Health Organization (2020, January 30). *Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV)*. Retrieved from https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)

Zhao, L. H., Zhao, X. P., Zhang, L. F., & Huang, Q. H. (2013). Association of cognitive emotion regulation with depression among nurses. *Chinese Journal of Public Health*, *29*(6), 887–889.

Zhu, X. Z., Luo, F. S., Yao, S. Q., Randy, P. A., & John, R. Z. A. (2007). Reliability and validity of the Cognitive Emotion Regulation Questionnaire-Chinese Version. *Chinese Journal of Clinical Psychology*, *15*(2), 121–124, 131. https://doi.org/10.3969/j.issn.1005-3611.2007.02.004

Zu, Z. Y., Jiang, M. D., Xu, P. P., Chen, W., Ni, Q. Q., Lu, G. M., & Zhang, L. J. (2020). Coronavirus disease 2019 (COVID-19): A perspective from China. *Radiology*, *296*(2), E15–E25. https://doi.org/10.1148/radiol.2020200490