ORIGINAL ARTICLE

The relationship between resilience, anxiety and depression among patients with mild symptoms of COVID-19 in China: A cross-sectional study

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Abstract

Aims and objectives: To explore the role of resilience in anxiety and depression and to clarify their relationships among patients with mild symptoms of coronavirus disease 2019 (COVID-19) in Wuhan, China.

Background: The outbreak of COVID-19 has negatively affected some individuals, but resilience plays a decisive role in the response of individuals under pressure and can help them deal with pressure more effectively.

Design: The cross-sectional descriptive correlational survey was reported in line with the STROBE guidelines.

Subject and setting: In total, 296 patients from FangCang Hospital in Wuhan, Hubei, China, with mild symptoms of COVID-19 were recruited.

Methods: Participants were recruited through convenience sampling. The data collected included their demographic information, the Connor-Davidson Resilience Scale and Hospital Anxiety and Depression Scale.

Results: A small number of patients in this study had above threshold anxiety (subthreshold anxiety and major anxiety) and depression (subthreshold depression and major depression). The mean total resilience score of the participants was slightly below the normal level of ordinary Chinese adults. Resilience was inversely associated with and was a protective factor for both anxiety and depression in our samples. Risk factors for anxiety include being female and having colleagues with COVID-19, while a risk factor for depression was having family members with COVID-19.

Conclusions: This study shows that after taking the general demographics into consideration, higher levels of resilience were associated with lower anxiety and depression among mild COVID-19 patients in Wuhan, China.

Relevance to clinical practice: Health professionals, especially clinical nurses, need to be aware of the psychological status of COVID-19 patients and promote resilience to improve their mental health.

1 | INTRODUCTION

In December 2019, an outbreak of a novel coronavirus occurred in Wuhan (Hubei, China) before it quickly spread through other regions of China. Over the past several weeks, the total number of patients with the coronavirus disease 2019 (COVID-19) and associated deaths has been increasing (Yang et al., 2020). Because of the rapidly increasing numbers of deaths, patients confirmed with having COVID-19 have been experiencing psychological problems including anxiety, depression and stress. Additionally, the symptoms of fever, cough, hypoxia and the fear of worsening symptoms may contribute to increasing levels of anxiety and depression (Xiang et al., 2020).

2 | BACKGROUND

Any major epidemic outbreak will have a negative effect on individuals (Duan & Zhu, 2020). For instance, the existing psychiatric symptoms of patients may worsen until it may impair their daily functioning and cognition (Yang et al., 2020). The emergence of COVID-19 parallels the 2003 outbreak of severe acute respiratory syndrome (SARS), which was caused by another coronavirus that killed 349 of 5,327 patients confirmed with the infection in China (Xiang, Yu, Ungvari, Correll, & Chiu, 2014). Although the diseases have different clinical presentations (Chan et al., 2020; Wang, Horby, Hayden, & Gao, 2020), the epidemiological features, infectious cause, fast transmission pattern and insufficient preparedness of health authorities to address the outbreaks are similar (Xiang et al., 2020). Based on the observations of mental health consequences of SARS patients in 2003, the disease had significant impact on their psychological status and the most common psychological problems of patients with SARS were anxiety and depression (Wang et al., 2005; Wu, Chan, & Ma, 2005). Furthermore, poor psychological status can also impair their quality of life post-discharge (Kwek et al., 2006). On the other hand, according to the Chinese Center for Disease Control and Prevention, up until 11 February 2020, around 81% of the cases confirmed with COVID-19 were classified as mild cases, with no deaths reported among this group (Wu & McGoogan, 2020). Therefore, it is particularly important to pay attention to the mental health of mild patients with confirmed COVID-19 to help them return to a normal life after rehabilitation.

Regarding the psychological suffering of individuals, an important key psycho-social factor was psychological resilience. Resilience plays a decisive role in the response of individuals under pressure and can help them deal with pressure more effectively (Richardson, 2002). In other words, resilience means adapting well and promoting positive changes in the face of adversity,

> ## What does this paper contribute to the wider global clinical community?
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> - A small number of patients with mild symptoms of COVID-19 had anxiety and depression. Patients' mean total resilience score was slightly below the normal level of ordinary adults in China.
> - Resilience can protect patients with mild symptoms of COVID-19 against anxiety and depression.
> - Providing needed social support to patients with mild symptoms of COVID-19 and enhancing their confidence about rehabilitation which aim to promote resilience may be effective and help alleviate their negative psychological status.

stress, trauma and even some considerable threats (Southwick & Charney, 2012). Resilience is also the ability of a person to protect his/her mental health when faced with objective difficulties and adverse circumstances (Poudel-Tandukar et al., 2019; Ristevska-Dimitrovska, Stefanovski, Smichkoska, Raleva, & Dejanova, 2015). Resilience is not a single feature of the person, but it is a result of the interactions between internal resilience factors and environmental factors (Luthar, Cicchetti, & Becker, 2000). Therefore, it is believed that higher levels of resilience can protect a person from psychiatric disorders. That being said, the psychological status of patients with COVID-19 and their ability to protect their mental health after being diagnosed with COVID-19 has not yet been sufficiently explored.

To solve the problems above, we aimed to explore resilience, anxiety and depression, and to clarify the relationship among the three in patients with mild symptoms of COVID-19, which can lay the foundation for targeted psychological interventions.

3 | METHODS

3.1 | Design and sample

This study employed a cross-sectional descriptive correlational survey. Through convenience sampling, we recruited patients with mild symptoms of COVID-19 from FangCang Hospital in Wuhan, China. This study was executed and reported in accordance with STROBE Statement: guidelines for reporting observational studies (Appendix S1). The inclusion criteria were (a) patients diagnosed with COVID-19 (National Health Commission of the People's Republic of China, 2020a) who stayed in FangCang Hospital and

received relevant treatment (e.g. oxygen therapy and antiviral therapy), (b) patients aged 18 years and above and (c) willing to participate in the study and is able to communicate in Chinese. The exclusion criteria were patients (a) with a history of mental illness, (b) with a severe cognitive impairment and/or audio-visual impairment, (c) with poor physical condition and (d) who participated in other relevant studies.

Kendall's sample size calculation principle yields sample sizes 5–10 times the number of variables (Lewis, 2009). In our research, there were 15 variables (7 related to social demographic information, 3 to disease-related information, 2 to the anxiety and depression and 3 to the resilience). Considering 20% of the dropout, the sample size in this study was set at 90–180 [$15 \times 5 \times (1 + 0.2) = 90$–$15 \times 10 \times (1 + 0.2) = 180$].

3.2 | Ethical approval

Before answering the questionnaire, the researchers informed the patients of the study's purpose, their rights and the fact that they could withdraw from the research at any time. All eligible participants provided informed consent before they completed the questionnaire. This study was approved by our university's Institutional Review Board (IRB) [No: E202073] before data collection began.

3.3 | Measurements

3.3.1 | The general information questionnaire

The self-compiled demographic questionnaire aimed to collect patients' characteristics such as age, gender, marital status, monthly household income, educational level, the length of stay in hospital and whether patients' symptoms have improved.

3.3.2 | Connor-Davidson resilience scale (Chinese version; CD-RISC)

The patients' resilience was measured by CD-RISC. The original version was developed by Connor and Davidson (2003) and was translated to Chinese by Yu and Zhang (2007), with authorisation from the original developers. The CD-RISC in Chinese consists of 25 items representing three dimensions: tenacity, strength and optimism. It employs a 5-point Likert-type scale (0 = "never" to 4 = "almost always"). The total scores range from 0–100, and higher total scores indicate higher levels of resilience (Yu & Zhang, 2007). The scale can effectively measure the resilience of the general population and clinical patients, and has good reliability and validity (Davydov, Stewart, Ritchie, & Chaudieu, 2010). The reliability of the CD-RISC among Chinese residents was 0.91 (Yu & Zhang, 2007), and Cronbach's alpha of the scale in this study was .959.

3.3.3 | Hospital Anxiety and Depression Scale (HADS)

The HADS—a scale developed by Zigmond—was used to measure patients' psychological levels of anxiety and depression (Zigmond & Snaith, 1983). The Chinese version of HADS was then developed by Leung, and this version had good internal consistency and favourable scale equivalence when compared with the original English version (Leung, Ho, Kan, Hung, & Chen, 1993). The scale was a self-report instrument consisting of 14 items across two dimensions: anxiety and depression. It employs a 4-point Likert-type scale (0–3) yielding a total score range of 0–21 (Leung et al., 1993). The subscales of anxiety and depression were scored separately by summing the items and then classifying as follows: normal (0–7), possible (8–10) and severe (≥11) (Bartram, Yadegarfar, & Baldwin, 2009). Cronbach's alpha for the anxiety and depression dimensions was .796 and .803, respectively.

3.4 | Data collection

Data were collected from 3 March 2020–5 March 2020 using the convenience sampling method, and the data collection was completed by a researcher and two research assistants. Following the principle of not disturbing patient's rest, researchers explained the purpose of the study to them. Then, researchers introduced the contents of the questionnaire and explained how to complete it. Lastly, they distributed a Wenjuanxing link (an online crowdsourcing platform in China) to the electronic questionnaire by scanning a Quick Response code. Wenjuanxing is a relatively secure platform, and there is no risk of any data breach and leakage by a third party.

3.5 | Data analysis

Statistical analyses were conducted with IBM SPSS Statistics version 20.0 (IBM). Descriptive data were presented as means and standard deviations, while categorical variables were described using frequency and percentage. Pearson's correlation analyses were used for correlations between two variables, and a chi-squared test was used to analyse the significance of socio-demographic differences among anxiety and depression. Binary logistic regression analyses were used to examine the risk factors and protective factors of anxiety and depression. Anxiety and depression were analysed as dependent variables. The socio-demographic characteristics of samples which were significantly different among anxiety (gender, colleagues confirmed with COVID-19) and depression (family members confirmed with COVID-19) were dependent variables and resilience which was treated as categorical variable according to the 27% grouping principle was also treated as dependent variable, then the variables were screened using the enter method (entered α = .10, exited α = .15), and then logistic regression model was made. According to the scale instructions

TABLE 1 Sample characteristics and its difference among anxiety and depression (N = 296)

Variables	N (%) (for the total sample)	Anxiety			Depression		
		Normal group (n = 234,79.1%)	Anxiety group (n = 62, 20.9%)	χ²/p	Normal group (n = 241, 81.4%)	Depression group (n = 55, 18.6%)	χ²/p
Age, years							
18–20	8 (2.7)	8 (100)	0	3.082/.367	8 (100)	0 (0)	3.601/.279
21–40	157 (53.0)	125 (79.6)	32 (20.4)		122 (77.7)	35 (22.3)	
41–60	120 (40.5)	91 (75.8)	29 (24.2)		101 (84.2)	19 (15.8)	
≥61	11 (3.7)	10 (90.9)	1 (9.1)		10 (90.9)	1 (9.1)	
Gender							
Male	173 (58.4)	147 (85.0)	26 (15.0)	8.803/.003*	145 (83.8)	28 (16.2)	1.580/.209
Female	123 (41.6)	87 (70.7)	36 (29.3)		96 (78)	27 (22)	
Marital status							
Single	54 (18.2)	44 (81.5)	10 (18.5)	0.591/.957	46 (85.2)	8 (14.8)	1.742/.590
Married	229 (77.4)	179 (78.2)	50 (21.8)		184 (80.3)	45 (19.7)	
Divorce	10 (3.4)	8 (80)	2 (20)		9 (90)	1 (10)	
Widowed	3 (1.0)	3 (100)	0 (0)		2 (66.7)	1 (33.3)	
Educational level							
Elementary school	3 (1.0)	3 (100)	0 (0)	0.940/.388	1 (33.3)	2 (66.7)	5.144/.250
Middle school	49 (16.6)	34 (69.4)	15 (30.6)		39 (79.6)	10 (20.4)	
High school	63 (21.3)	53 (84.1)	10 (15.9)		54 (85.7)	9 (14.3)	
College	164 (55.4)	130 (79.3)	34 (20.7)		132 (80.5)	32 (19.5)	
Postgraduate	17 (5.7)	14 (82.4)	3 (17.6)		15 (88.2)	(11.8)	
Living place							
City	281 (94.9)	223 (79.4)	58 (20.6)	1.472/.445	227 (80.8)	54 (19.2)	2.193/.287
Town	10 (3.4)	8 (80)	2 (20)		10 (100)	0 (0)	
Village	5 (1.7)	3 (60)	2 (40)		4 (80)	1 (20)	
Monthly household income, RMB							
≤2,000	11 (3.7)	8 (72.7)	3 (27.3)	3.315/.345	8 (72.7)	3 (27.3)	0.840/.845
2,001–4,000	60 (20.3)	43 (71.7)	17 (28.3)		49 (81.7)	11 (18.3)	
4,001–6,000	77 (26.0)	64 (83.1)	13 (16.9)		63 (81.8)	14 (18.2)	
≥6,001	148 (50.0)	119 (80.4)	29 (19.6)		121 (81.8)	47 (18.2)	
The length of staying in hospital							
≤10 days	49 (16.6)	36 (73.5)	13 (26.5)	1.796/.364	40 (81.6)	9 (18.4)	0.556/.813

(Continues)

TABLE 1 (Continued)

Variables	N (%) (for the total sample)	Anxiety			Depression		
		Normal group (n = 234, 79.1%)	Anxiety group (n = 62, 20.9%)	χ^2/p	Normal group (n = 241, 81.4%)	Depression group (n = 55, 18.6%)	χ^2/p
11–20 days	242 (81.8)	193 (79.8)	49 (20.2)		196 (81)	46 (19.0)	
≥21 days	5 (1.7)	5 (100)	0 (0)		5 (100)	0 (0)	
Family members confirmed with COVID-19							
Yes	175 (59.1)	137 (78.3)	38 (21.7)	0.153/.772	135 (77.1)	40 (22.9)	5.174/.023*
No	121 (40.9)	97 (80.2)	24 (19.8)		106 (87.6)	15 (12.4)	
Colleagues confirmed with COVID-19							
Yes	49 (16.6)	31 (63.3)	18 (36.7)	8.840/.004*	36 (73.5)	13 (26.5)	2.453/.117
No	247 (83.4)	203 (82.2)	44 (17.8)		205 (83.0)	42 (17.0)	
Whether symptoms improved							
Obviously improvement	167 (56.4)	138 (82.6)	29 (17.4)	3.082/.367	138 (82.6)	29 (17.4)	0.943/.807
Slightly improved	78 (26.4)	57 (73.1)	21 (26.9)		63 (80.8)	15 (19.2)	
No change	43 (14.5)	33 (76.7)	10 (23.3)		34 (79.1)	9 (20.9)	
Slightly worse	8 (2.7)	6 (75)	2 (25)		6 (75)	2 (25)	

Note.: When analysing the difference in age, marital status, educational level, living place, monthly household income, the length of staying in hospital, family members confirmed with COVID-19 and whether symptoms improved among anxiety, part of the expected counts were <5, and then, we used Fisher's exact test to examine the differences. When analysing the difference in age, marital status, educational level, living place, monthly household income, the length of staying in hospital, colleagues confirmed with COVID-19 and whether symptoms improved among depression, part of the expected counts were <5, and then, we used Fisher's exact test to examine the difference. Other variables were analysed by Pearson's chi-square tests.

*p < .05.

of HADS (Leung et al., 1993), we classified the scores of anxiety or depression dimension from 0–7 as normal group and classified the scores >8 as the anxiety (subthreshold anxiety and major anxiety) or depression (subthreshold depression and major depression) group. According to the 27% delimitation principle (Chen, Peng, Tang, & Li, 2012), we sorted resilience scores among all the patients in descending order. The first 27% were known as high-level resilience, the last 27% were as low-level resilience, and then the middle part was medium-level resilience. The concept of 27% grouping is a commonly used indicator in the analysis of scale items. It comes from the discriminant analysis method of test preparation. In the norm reference test, if the test score values are normally distributed and the test sample is large, the reliability of the obtained discrimination is the largest when using 27% as a grouping principle (Wu, 2010).

4 | RESULTS

4.1 | Sample characteristics and its difference among anxiety and depression

A total of 299 patients took part in this study. Three patients declined to complete the questionnaire. Consequently, only 296 patients were included in analyses (valid response rate = 98.9%). The socio-demographic characteristics of patients and the significant

TABLE 2 The difference in resilience among patients between normal groups and anxiety or depression group

Variables	N	Resilience (rank mean)	Resilience (rank sum)
Normal group	234	162.18	37,949.00
Anxiety group	62	96.89	6,007.00
Z/p		−5.342/<.001*	
Normal group	241	162.51	39,165.50
Depression group	55	87.10	4,790.50
Z/p		−5.898/<.001*	

Note: Because the data are not normally distributed, Mann–Whitney tests were used in the analysis of the difference in resilience among patients between normal groups and anxiety or depression group.
*$p < .05$.

differences in socio-demographic characteristics among anxiety and depression are shown in Table 1. Gender ($\chi^2 = 8.803$, $p = .003$) and colleagues confirmed with COVID-19 ($\chi^2 = 8.840$, $p = .003$) influenced anxiety, while family members confirmed with COVID-19 ($\chi^2 = 5.174$, $p = .023$) affected depression. The total mean score of anxiety and depression was 5.22 and 4.39, while the standard deviation was 3.36 and 3.65, respectively. It means that the levels of anxiety and depression among patients were normal according to the scoring principle (0–7, normal). Approximately 20.9% and 18.6% of the patients in this study had anxiety (subthreshold anxiety and major anxiety) and depression (subthreshold depression and major depression).

4.2 | Resilience, anxiety, depression and their associations

The mean total scores for resilience among mild patients with COVID-19 was 69.53 and the standard deviation was 16.98, which was slightly below the normal level of ordinary adults in China. Resilience was inversely associated with both anxiety ($r = -.391$, $p < .001$) and depression ($r = -.472$, $p < .001$) in this study.

Then, we compared the difference in resilience for patients between the normal group and the anxiety or depression group. The results showed that there was a significant difference in resilience between the anxiety and depression groups and normal groups. The statistics are displayed in Table 2.

4.3 | Binary logistic regression analyses examining covariates of anxiety and depression

As mentioned, anxiety differed significantly depending on the sample's gender, colleagues confirmed with COVID-19 and resilience. When binary logistic regression analyses were conducted, anxiety was placed as the dependent variable, while gender, colleagues confirmed with COVID-19 and resilience were the independent variables. The variables were then screened using the enter method, and logistic regression analysis was performed (entered $\alpha = .10$, exited $\alpha = .15$). The value of odds ratio (OR) is an accurate estimate of relative risk of a disease. In logistic regression, if the value of OR = 1 then this indicates that the factor does not contribute to the occurrence

TABLE 3 Logistic regression analysis examining covariates of anxiety

Model	Assignment description	B	SE	Wald	p	OR	95% CI
Constant		−0.845	.614	1.893	.169	0.430	
Gender	Male = 0, female = 1	0.801	.308	6.744	.009*	2.227	1.217–4.075
Colleagues confirmed	No = 0, yes = 1	1.047	.369	8.066	.005*	2.849	1.383–5.866
Resilience	Low level of resilience = 1 Moderate level of resilience = 2 High level of resilience = 3	−1.016	.222	20.978	<.001*	0.362	0.235–0.559

*$p < .05$.

TABLE 4 Logistic regression analysis examining covariates of depression

Model	Assignment description	B	SE	Wald	p	OR	95% CI
Constant		0.228	.480	0.225	.635	1.256	
Family members confirmed	No = 0, yes = 1	0.712	.345	4.263	.039*	2.039	1.037–4.010
Resilience	Low level of resilience = 1 Moderate level of resilience = 2 High level of resilience = 3	−1.201	.238	25.416	<.001*	0.301	0.189–0.480

*p < .05.

of the disease. If the value of OR is >1, this indicates that the factor is a risk factor, while a value <1 indicates that the factor is a protective factor. As shown in Table 3, adjusting for other factors, the risk factors of anxiety were as follows: (a) gender—female patients were two times more likely to have anxiety compared with males (OR = 2.227, p = .009) and (b) patients with colleagues confirmed with COVID-19—they were nearly three times more likely be anxious compared with patients without colleagues confirmed with COVID-19 (OR = 2.849, p = .005). On the contrary, resilience was a protective factor for anxiety (OR = 0.362, p < .001) with patients with low level of resilience becoming 0.5 times more likely be anxious compared with those with moderate level of resilience. This also applies to the comparison between the high resilience group and the low resilience group. Patients with a high level of resilience are much less likely (OR = 0.362, p < .001) to be anxious compared to those with low levels of resilience.

As we know, depression was significantly affected by having family members confirmed with COVID-19 and resilience levels. Therefore, we took depression as the dependent variable, while family members confirmed with COVID-19 and resilience were taken as independent variables when we conducted binary logistic regression analyses. The other steps were performed the same way as the anxiety analysis. The results indicated that family members confirmed with COVID-19 was a risk factor for depression (OR = 2.039, p = .039), while resilience was a protective factor (OR = 0.301, p < .001). The statistics are summarised in Table 4.

5 | DISCUSSION

This study explored the role of resilience in anxiety and depression and clarified the relationships among the three patients with mild symptoms of COVID-19 in Wuhan, China. Our data aim to deepen the understanding of improving resilience to facilitate the development of more mental health-targeted interventions among patients with this disease.

In this research, approximately 20.9% and 18.6% of the patients had anxiety (subthreshold anxiety and major anxiety) and depression (subthreshold depression and major depression), with the total mean score of anxiety and depression being 5.22 and 4.39 with a standard deviation of 3.36 and 3.65, respectively. The results indicate that most patients had healthy psychological status. Up until

11 February 2020, no deaths were reported among patients with mild symptoms (Wu & McGoogan, 2020) which may be a source of relief and may lessen the patients' negative emotions up to a certain extent. According to the policy of Chinese government (National Health Commission of the People's Republic of China, 2020b), the government pays the full cost of the patient's treatment and provides them with daily meals and necessities for free which can reduce the financial burden of patients and allow them to cooperate wholeheartedly to achieve proper rehabilitation. Most importantly, since the outbreak of COVID-19, several health professionals had volunteered to help hospitals in Wuhan care for people confirmed with COVID-19. It is worth noting that a large majority of these health professionals are clinical nurses. Although they are vulnerable to high risk of infection (Chen et al., 2020), they remain positive and optimistic and this positive attitude may help patients overcome their sickness. According to Chinese news (China CCTV, 2020), nurses have led patients to engage in square dancing to improve confidence. Therefore, most mild patients with COVID-19 are able to keep good psychological status.

Patients' mean level of resilience in this study was slightly below the normal level of ordinary adults in China (Yu & Zhang, 2007) and slightly higher than the level of Chinese patients in general (Gao, Yuan, Pan, & Wang, 2019). The possibility of COVID-19 leading to death and the onset of a sudden and immediately life-threatening illness may lead to post-traumatic stress disorder (PTSD) according to previous studies (Kessler et al., 2017). Therefore, patients with COVID-19 may have lower levels of resilience compared with ordinary adults during the treatment stage. On the other hand, in this particular epidemic situation, nurses have been in contact with patients for a long time and they also provide patients with humane care and explanation of disease-related knowledge. This can enhance the informational support, emotional support and confidence of rehabilitation of the patients. Accordingly, social support (informational support and emotional support) is a protective factor that enhances resilience (Mo, Lau, Yu, & Gu, 2014; Southwick & Charney, 2012). Previous studies showed that patients who had confidence in his/her ability to overcome a difficult situation or stressful event had greater levels of resilience (Li et al., 2019; Yang & Kim, 2016). Resilience improvement appears to play a significant role for patients' mental health recovery (Pieters, 2016), suggesting that increased resilience may help individuals resist negative responses generated by stressful events.

We found that resilience had negative associations with anxiety and depression, since patients with higher levels of resilience experienced lower levels of anxiety and depression. It is possible that patients who had higher levels of resilience can cope with psychological distress more successfully because they are able to remain positive despite the life-threatening event (Guo, Liu, Kong, Solomon, & Fu, 2018). As revealed in the binary logistic regression analyses examining covariates of anxiety and depression, being female and having colleagues confirmed with COVID-19 were risk factors for anxiety, while having family members confirmed with COVID-19 was a risk factor for depression. Previous studies (Carragher et al., 2016) also found that females who have suffered a traumatic event are twice as likely to be diagnosed with PTSD than males, and this is consistent with the results in this study since females were more likely to suffer from psychological symptoms. Therefore, the medical professionals need to pay special attention to females' mental state at work. Family members and colleagues of patients confirmed with COVID-19 may increase panic in patients, and they may also cause them to worry about the condition of their family members and colleagues consequently aggravating their negative emotions. Hence, strengthening the health education-related COVID-19 and communicating with patients could be beneficial to improving the psychological condition of the patients. To our knowledge, there are a few similar studies reporting an association between resilience and anxiety or depression among patients in China. Our findings indicated that resilience was a protective factor for anxiety and depression which is consistent with those studies highlighting that there is a protective effect of resilience on mental health in different populations (Kim, Lim, Kim, & Park, 2019; Yu, Raphael, Mackay, Smith, & King, 2019). One of the most studied populations in terms of resilience is cancer patients. However, there exist differences between cancer patients and mild patients with COVID-19. When diagnosed with COVID-19, patients need to be treated in quarantine and lack the company of family. This could increase patients' anxiety, loneliness, anger and guilt about the effects of contagion, quarantine and stigma on their families and friends (Xiang et al., 2020). They are more vulnerable than cancer patients in terms of social support. From this point of view, the protective effect of resilience against negative emotions is particularly important. Moreover, resilient individuals can cope with psychological distress more successfully since they are able to grow through the life-threatening event (Guo et al., 2018) meaning that they are less likely to experience negative mental health effects despite being exposed to a stressful situation (Rutter, 2007). Hence, improving the level of resilience for patients may be beneficial for the prevention of psychological stress such as anxiety and depression. Therefore, a resilience improvement programme should be explored and developed.

5.1 | Limitations

This study had several limitations. First, the samples were collected from only one hospital in Wuhan, China; therefore, it may not be possible to extend the results to all patients with mild symptoms of COVID-19. Second, the outcomes were investigated at one point in time, and random sampling was not employed. This means that the study only represents a "snap-shot" of the mental health of patients. Third, we did not investigate all factors that may influence the anxiety and depression of patients with mild symptoms of COVID-19. More comprehensive and prospective studies concerning anxiety and depression will be needed. Fourth, because of the cross-sectional design, the causal relationships among the variables should be interpreted with caution. Longitudinal research is recommended to confirm the causality of the current findings. Fifth, according to the standards for admission of patients in FangCang Hospital in Wuhan formulated by National Health Commission of the People's Republic of China, the patients with mild symptoms of COVID-19 in this study were not associated with fatal diseases. Therefore, this study did not compare the coping situations between patients of COVID-19 and patients with fatal diseases. In follow-up studies, we will compare the group of patients with potentially fatal diseases with patients in this study to see the difference in coping situations.

6 | CONCLUSIONS

In summary, the psychological status of most patients with mild symptoms of COVID-19 was normal and the resilience among patients was relatively high compared with the other patients in this study. Patients with mild symptoms of COVID-19 who possess higher levels of resilience may experience lower levels of anxiety and depression, thus making resilience a protective factor because it helps patients combat negative emotions. Therefore, improving the level of resilience for patients may be beneficial for the prevention of psychological stress and may contribute to the improvement of mental health, especially in terms of anxiety and depression.

7 | RELEVANCE TO CLINICAL PRACTICE

Resilience was inversely associated with and was a protective factor for both anxiety and depression in our samples. With this, health professionals must be aware of the psychological status of their patients, provide and encourage them to use much needed social support (informational support, emotional support, etc.) and enhance their confidence about rehabilitation in order to promote resilience to help alleviate their negative psychological status.

CONFLICT OF INTEREST
The authors have no conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS'

Study design: Jingping Zhang; data collection: Zhen Yang, Xiao Wang, Lili Dong, Fusheng Wang, Ruihong Wei; data analysis: Jie Zhang, Juan Li; study supervision: Jing-Ping Zhang, Xiao Wang, Zhen Yang; manuscript writing: Jie Zhang; critical revisions for important intellectual content: Jie Zhang, Zhen Yang, Juan Li, Yifei Li.

ETHICS APPROVAL

This study was approved by Central South University's IRB [No: E202073] before data collection.

PATIENT CONSENT FOR PUBLICATION STATEMENT

All patients provided informed consent before they filled the questionnaire.

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Additional supporting information may be found online in the Supporting Information section.