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The psychological symptoms of patients with mild symptoms of coronavirus disease (2019) in China: A cross-sectional study

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Abstract

Aims: To determine psychological symptoms of patients with mild symptoms of coronavirus disease 2019 in China and to explore the influencing factors.

Design: A cross-sectional study.

Methods: A convenience sample of 296 mild coronavirus disease 2019 patients were recruited from a *Fangcang* hospital in Wuhan, Hubei Province, from 3–5 March, 2020. Participants were assessed using a sociodemographic and clinical characteristics questionnaire, and Symptom Check List 90. The binary logistic regression was utilized to explore the influencing factors of psychological symptoms of patients with mild symptoms of coronavirus disease 2019.

Results: In total, 296 of 299 patients with mild symptoms of coronavirus disease 2019 participated in the study (response rate: 99.0%). The findings revealed that 12.8% patients with mild symptoms have mental health problems; the most common psychological symptoms are phobic anxiety (58.4%), paranoid ideation (50.7%) and psychoticism (40.2%). Female patients [OR = 3.587, 95% CI (1.694–7.598)] and those having physical symptoms currently [OR = 2.813, 95% CI (1.210–6.539)] are at higher risk, while those in the middle duration of hospitalization [OR = 0.278, 95% CI (0.121–0.639)] protect against mental-health problems.

Conclusions: The minority of patients with mild symptoms of coronavirus disease 2019 were still suffering from psychological symptoms. Healthcare providers are recommended to pay particular attention to screening these high-risk groups (women, those in the initial stages of hospitalization and those with physical symptoms currently) and implement targeted psychological care as required.

Impact: This study found that most patients of coronavirus disease 2019 in *Fangcang* hospital exhibited normal mental health at par with the general Chinese norm and the minority of them were suffering from psychological symptoms. The findings can provide a reference for healthcare providers to screen high-risk psychological symptoms groups and implement targeted psychological intervention for patients with coronavirus disease 2019.

Juan Li and Zhen Yang contributed equally to this study. They shared the first authorship equally.

1 | INTRODUCTION

Since December 2019, with the massive movement of people during the Chinese Spring Festival, a novel coronavirus outbreak of pneumonia has been spreading throughout China swiftly (Huang et al., 2020; Zhu et al., 2020; Zu et al., 2020). As of August 16, 2020, a total of more than 21 million cases of COVID-19 and 761,779 deaths worldwide; China has confirmed 83,046 cases and 4,634 deaths (World Health Organization, 2020). It is reported that the coronavirus disease 2019 (COVID-19) has caused more deaths than severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome combined, despite a lower-case fatality rate (2%; Elisabeth, 2020). The novel coronavirus pneumonia has become a public health emergency of international concern (Khot & Nadkar, 2020).

1.1 | Background

To prevent further spreading of the epidemic, one of the most effective measures is to implement quarantine (Centers for Disease Control & Prevention, 2017). The latest 'New Coronavirus Pneumonia Diagnosis and Treatment Program (Trial Sixth Edition)' published by the National Health Commission of the People's Republic of China also emphasizes that patients with the novel coronavirus must be treated in designated hospitals with effective isolation and protection conditions (National Health Commission of the People's Republic of China, 2020a). Therefore, China subsequently set up a group of quarantine facilities (called *Fangcang* hospitals) to treat patients with mild symptoms of COVID-19 (National Health Commission of the People's Republic of China, 2020b), who were diagnosed with mild symptoms of coronavirus pneumonia according to the 'Novel Coronavirus Pneumonia Diagnosis and Treatment Plan (Trial Sixth Edition)', referring to low fever, mild fatigue, and no pneumonia on imaging (National Health Commission of the People's Republic of China, 2020a).

Quarantine can protect the public and reduce the risk of potential contagion, but it comes with negative emotions on patients, which not only are harmful to the patients' mental health (Brooks et al., 2020; Sharma et al., 2020) but also affect recovery from the disease (Wilder-Smith et al., 2020; Wilder-Smith & Freedman, 2020; Xie, 2005). Yang (2004) conducted a research on the emotional response of SARS patients and found that 96.6% of SARS patients experienced inferiority, loneliness, and abandonment due to isolation during their hospitalization, and 27.6% of patients suffered from depressive or even suicidal thoughts due to the death of family members. A follow-up study of SARS discharge patients (Wang et al., 2003) found that 41% of patients developed post-traumatic stress disorder after the disease was cured, and 30% of patients suffered from psychological problems such as anxiety or depression (Sun, 2005). Ogoina (2016) also conducted a systematic review of the emotional and behavioural responses of the public, including patients, during the Ebola virus disease outbreak. The results showed that anxiety, fear, and panic were the most common emotions caused by the Ebola outbreak. Similarly, infection with COVID-19, also negatively affects the individuals' psychological adaptation (Bao et al., 2020; Liu, Xu, et al., 2020; Vindegaard & Benros, 2020) because of the uncertain duration of quarantine, unknown disease outcome, insufficient information and medical supplies, fear of infecting others, and stigmatization. Some researchers (Bo et al., 2020) found that 96.2% of patients with mild symptoms of COVID-19 in *Fangcang* hospital had significant posttraumatic stress symptoms during hospitalization. These symptoms may lead to loneliness, depression, fear, anxiety, panic, avoidance, sleep disorders, and other behavioural problems, which raised global mental-health professionals' attentions (Center for the Study of Traumatic Stress, 2020a; Xiang et al., 2020).

Researchers have also conducted some studies on the psychological effects of acute infectious diseases on patients. Some studies have demonstrated that gender (Sareen et al., 2013), age (Yan et al., 2004), marital status (Liu, 2007), educational level (Zhang, 2001), occupations (Gao et al., 2006), duration of treatment (Guan et al., 2006), and severity of disease (So et al., 2004) are possible influencing factors leading to changes in the psychological stress response of SARS patients. This suggests that it is important for healthcare providers to recognize the mental-health conditions of different patients and provide psychological care while treating patients with acute infectious diseases according to their varying characteristics.

Existing studies (Shigemura et al., 2020; Walton et al., 2020; Wang et al., 2020) mainly focused on both short-term and long-term psychological effects on general populations and frontline healthcare providers during the COVID-19 epidemic. However, to date, few studies determine the psychological symptoms of patients with COVID-19 and its influencing factors during the outbreak of the COVID-19 in China, providing little guidance for healthcare providers to implement targeted psychological intervention. Additionally, patients with mild symptoms of COVID-19, as the majority of patients, usually have clinically stable and mild physical symptoms, thus, those serious psychological symptoms may likely to be the most troublesome problems for patients with mild symptoms, which may affect their holistic health conditions and rehabilitation. Therefore, the study aims to examine the psychological symptoms and influencing factors of patients with mild symptoms of COVID-19, and lay a foundation for healthcare providers to identify and offer psychological interventions for patients with mild symptoms of COVID-19 in China or other places affected by the epidemic.

2 | THE STUDY

2.1 | Aims

This study aims to examine the psychological symptoms and influencing factors of patients with mild symptoms of COVID-19.

2.2 | Design

A cross-sectional study was employed according to Strengthening the Reporting for Observational Studies in Epidemiology guidelines.

2.3 | Participants

A convenience sample of patients with mild symptoms of COVID-19 was recruited from one *Fangcang* hospital in Wuhan, Hubei Province, from 3–5 March, 2020. Firstly, we obtained the ethics approval from our university's Institutional Review Board (IRB) and the survey approval from nursing managers of the local hospital. Then, the recruitment notice for this study was circulated by a local nurse who worked as a research assistant, through a WeChat group (a widely used social-media platform in China), and contact with potential participants was established.

According to the unified national deployment in China, the *Fangcang* hospitals are mainly used to treat patients with mild symptoms, who are clinically stable and screened by a local, community-based medical institution. The inclusion criteria involved: (a) patients diagnosed with mild symptoms of coronavirus pneumonia according to the 'Novel Coronavirus Pneumonia Diagnosis and Treatment Plan (Trial Sixth Edition)', referring to low fever, mild fatigue, and no pneumonia on imaging (National Health Commission of the People's Republic of China, 2020a); (b) those who participated in the study voluntarily, with informed consent; and (c) those able to express their thoughts with clarity and consciousness. Correspondingly, the exclusion criteria involved: (a) people with previous severe mental or cognitive impairments, comprehension, memory, orientation, and other audio-visual impairments; and (b) those who participated in other related researches at the same time.

According to the Kendall's sample size calculation principle, the sample size is five to 10 times the number of independent variables (Lewis, 2002). There were 14 variables in this study, thus, the sample size was 84–168 with a 20% invalid response rate. As the recruitment rate was higher than expected, finally, a total of 296 of 299 patients with mild symptoms of COVID-19 participated in the study (response rate: 99.0%).

2.4 | Data collection

2.4.1 | Study instruments

Self-reported sociodemographic and clinical characteristics questionnaire
Participants' sociodemographic and clinical characteristics were collected. These included participants' age, gender, marital status, educational level, occupation, place of residence, average monthly earnings, duration of hospitalization, whether family members, friends, colleagues, and neighbours tested positive for COVID-19, whether symptoms such as fever, fatigue, cough, sore throat, and dyspnoea manifested, and whether patients' self-perceived symptoms improved.

Symptom check list 90
Symptom check list 90 (SCL-90) was introduced by Derogatis et al. (1973) as was a widely used self-report psychometric questionnaire. It was composed of 90 items and each item was measured on a five-point Likert scale from 1 (no) – 5 (severe). The SCL-90 was aimed at assessing different symptoms and mental conditions. There are 10 factors of the SCL-90 including somatization, obsessive-compulsive disease, interpersonal sensibility, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and other symptoms (reflecting sleep and diet condition). The total score was the sum of 90 item scores, and the score of each factor was equal to the total score of each factor divided by its item number. According to the Chinese norm (Wang, 1984; Yu et al., 2019), if the total score is more than 160 points, or the total number of positive items is more than 43 (each item with a score more than 1 point), or any factor's mean score is more than 2 points (the total score of a factor, divided by the item number of this factor), this indicates the individual has positive psychological symptoms. In the current study, total score more than 160 points was considered to be positive for psychological symptoms (Du et al., 2020; Liu, Zhou, et al., 2020). Chen and Li (2003) indicated that the Cronbach value of the whole scale was 0.97 and the Cronbach value of the 10 subscales was all above 0.69, and reliable. In this study, the Cronbach values of the whole scale and 10 subscales were 0.95 and all above 0.74, respectively, indicating good reliability.

2.4.2 | Procedures

The research team which was in charge of the study comprised five trained researchers, including two principal researchers and three research assistants. Prior to the study, three research assistants received a structured training conducted by one of the principal researchers about the purpose and procedures of the study, and key points of data collection. Three research assistants took charge of data collection as investigators and explained the purposes and procedures of the study to the participants and obtained the electronically informed consent. The research assistants communicated face to face with eligible participants at the research site, and distributed a "Survey Star" link (an online crowdsourcing platform in China) to the electronic questionnaire obtained by scanning a Quick Response code.

2.5 | Ethics statement

The ethics approval was obtained from the IRB (no: E202073) of our university before data collection. Prior to filling out any questionnaires, all participants were informed about the purpose and procedure of the study and they signed an electronically informed consent

form which specified that the whole study was carried out completely voluntarily, anonymously, and confidentially. Additionally, participants have the rights to decline the study at any time without any penalty.

2.6 | Data analysis

Data were inputted and analysed by using IBM SPSS 20.0 (SPSS Inc.). According to the total score, more than 160 implied positive for psychological symptoms. All samples were divided into the positive cases group (more than 160) and the negative cases group (less than or equal to 160). Non-normal data were described by median (*M*) and quartile range (*Q*). Categorical variables were denoted using frequency and percentage and compared using the Chi-squared test or Fisher's exact test, as appropriate. The influencing factors were analysed by the binary logistic regression analysis. We set the significance level $\alpha \leq 0.10$ as the criterion for including the variables and $\alpha \geq 0.15$ as the criterion for excluding the variables. A two-tailed $p < .05$ was considered statistically significant.

2.7 | Validity and reliability

The content appropriateness of measurement was evaluated via expert consultation, including a psychologist, a nurse manager, and two frontline nurses in local *Fangcang* hospital. Besides, a pilot test of 30 patients with COVID-19 in a *Fangcang* hospital was conducted to examine the reliability and validity of the measurement. The Cronbach values of the whole scale and 10 subscales were 0.95 and all above 0.74 in the current study, respectively, indicating good reliability. After data collection, all data were carefully examined and inputted into SPSS by two researchers independently. Prior to data analysis, researchers were required to check missing data, outliers.

3 | RESULTS

3.1 | Sociodemographic and clinical characteristics

A total of 296 of participants were recruited in the study (response rate: 99.0%). At the beginning of data collection, research assistants distributed 299 questionnaires, and two patients refused to participate in the study and one patient provided invalid responses. The mean age of all participants was 39.70 years (*SD* 10.14, range from 14–67). In total, 58.4% of participants were men, and the majority of participants were married (77.4%). The average duration of hospitalization was 13.98 days (*SD* 4.30, range from 1–38 days), as shown in Table 1.

3.2 | The condition of psychological symptoms

The normality test was performed on the total score; the separate score of each factor subscale and the number of positive items were

non-normal. The median and interquartile range are used to denote the total score and each factor score, as shown in Table 2. The median total score of the SCL-90 scale was 112, the median number of positive items was 20 items, and the median total score of the factor was 1.24. Based on a factor score of more than 2 – considered positive for psychological symptoms – the top three factors with the highest factor-positive rate were phobic anxiety (58.4%), paranoid ideation (50.7%), and psychoticism (40.2%), respectively. The positive case group accounted for 12.8% with 38 participants and the negative case group accounted for 87.2% with 258 participants correspondingly.

3.3 | The prevalence of psychological symptoms in patients with mild symptoms of COVID-19 by characteristics

There were differences in the positive and negative responses of the participants depending on sex, marital status, education level, duration of hospitalization, and whether physical symptoms were being experienced. When the total score is more than 160, it indicates the cases are positive for psychological symptoms. Using χ^2 or Fisher's exact test the differences recorded were statistically significant ($p < .05$). See Table 3.

3.4 | The influencing factors of psychological symptoms

Taking the mental-health problem as the dependent variable, gender, marital status, duration of hospitalization, and whether physical symptoms were being experienced were taken as independent variables. As shown in Table 4, adjusting for other factors, the risk of mental health problems were as follows: three times more likely in women than men ($p = .001$); 0.278 times more likely for patients who stayed in hospital for 11–20 days than patients who spent less than 10 days ($p = .003$); and three times more likely in patients exhibiting physical symptoms than patients without symptoms ($p = .016$).

4 | DISCUSSION

To our knowledge, this is one of the few studies which conducted a cross-sectional design to determine the prevalence, characteristics, and some sociodemographic factors influencing psychological symptoms of patients with mild symptoms of COVID-19. And these new findings of this study contribute to fill in the knowledge gaps of current psychological symptoms of patients with mild symptoms of COVID-19, their possible influencing factors, and lay a foundation for healthcare providers to identify and offer psychological interventions for patients with mild symptoms of COVID-19 in China or other places affected by the epidemic.

TABLE 1 Sociodemographic and clinical characteristics of patients with mild symptoms of coronavirus disease 2019 (N = 296)

Variables	N	%
Gender		
Male	173	58.4
Female	123	41.6
Age (years)		
≤20	8	2.7
20–40	157	53.0
41–60	121	40.9
≥60	10	3.4
Marital status		
Single	54	18.2
Married	229	77.4
Divorced	10	3.4
Spouse	3	1.0
Education level		
Primary school	3	1.0
Junior middle school	49	16.6
Senior middle school	63	21.3
Undergraduate	164	55.4
Postgraduate or above	17	5.7
Occupation		
Student	8	2.7
Medical staff	5	1.7
Personnel of enterprises and institutions, e.g., teachers, office workers	133	44.9
Farmer	1	0.3
Freelancer	60	20.3
Unemployed	11	3.7
Others	78	26.4
Residence		
City	281	94.9
Town	10	3.4
Countryside	5	1.7
Average monthly earnings (RMB)		
≤2,000	11	3.7
2,001–4,000	60	20.3
4,001–6,000	77	26.0
≥6,000	148	50.0
Duration of hospitalization (days)		
≤10	50	16.7
11–20	241	81.4
≥21	5	1.7
Family members confirmed with COVID-19		
Yes	175	59.1
No	121	40.9
Friends confirmed with COVID-19		

(Continues)

TABLE 1 (Continued)

Variables	N	%
Yes	29	9.8
No	267	90.2
Colleagues confirmed with COVID-19		
Yes	49	16.6
No	247	83.4
Neighbours confirmed with COVID-19		
Yes	31	10.5
No	265	89.5
Whether experiencing physical symptoms currently		
Yes	180	60.8
No	116	39.2
Whether patients' self-perceived symptoms improved		
Improved markedly	167	56.4
Improved mildly	78	26.4
No change	43	14.5
Worsened mildly	8	2.7

Note: We used convenience sampling to recruit mild patients with COVID-19 from one _Fangcang_ hospital in Wuhan, Hubei Province, Republic of China.

Personnel of enterprises and institutions include those who work in educational, technical or cultural service institutions, such as teachers, office workers, etc.

4.1 | The condition of psychological symptoms in patients with mild symptoms of COVID-19

According to the total score, greater than 160 implied positive for psychological symptoms, the results indicated that the patients with mild symptoms of COVID-19 mostly exhibited normal mental health as a whole, which is not consistent with other studies conducted. Bo et al. (2020) conducted a similar survey among 714 clinically stable patients with COVID-19 in five _Fangcang_ hospitals, which showed that 96.2% of patients have significant posttraumatic stress symptoms. The difference between the studies maybe that the patients in this study (39.70 SD 10.14 years old) were younger than that of Bo's (50.2 SD 12.9 years old). Younger patients may suffer less psychological symptoms compared to older patients. Because younger patients tended to deal with the negative impacts of the epidemic psychologically better and were more willing to seek disease-related knowledge and online mental-health services, such as WeChat, Weibo, and psychological assistance hotline (Thi et al., 2018; Chen et al., 2020), which provide supervision and guidance for addressing psychological symptoms.

Furthermore, the positive results of this study may be related to professional supports from healthcare providers. Some researchers (Peng et al., 2005; Liu et al., 2012) also found that effective emotional supports can reduce psychological symptoms in patients with SARS. Since the COVID-19 outbreak, a large number of medical staffs have provided professional health care to Wuhan voluntarily

(National Health Commission of the People's Republic of China, 2020c). It was reported that some healthcare providers have taught patients disease-related knowledge, played some mental health education videos, and led relaxation trainings, such as square dancing, Tai Chi, breathing exercises, mindfulness-based training, etc. (National Health Commission of the People's Republic of China, 2020d; Li et al., 2020; Pan et al., 2020), which may help relief patients' negative emotions, gain and maintain positive emotions, and strengthen the confidence of epidemic control. Additionally, because the costs of diagnosis and treatment of COVID-19 are also covered by government financial subsidies, patients do not have to be afraid of becoming a burden to their families and may likely to cooperate with treatments whole heartedly (Xinhuanet, 2020), which may be beneficial to their recoveries. Thus, the patients with mild symptoms of COVID-19 in *Fangcang* hospital mostly indicated normal mental-health conditions.

4.2 | The prevalence of psychological symptoms in patients with mild symptoms of COVID-19

In the current study, the minority of patients with mild symptoms of COVID-19 were still suffering from psychological symptoms and

TABLE 2 Factor scores and the proportion of factor positive of SCL-90 in patients with mild symptoms of coronavirus disease 2019 ($N = 296$)

Factors	Positive factors cases (N, for the total sample)	%	Mean	Q (P_{25}–P_{75})
Somatization	107	36.1	1.25	1.08–1.50
Obsessive-compulsive disease	84	28.4	1.40	1.20–1.80
Interpersonal sensibility	113	38.2	1.22	1.00–1.56
Depression	91	30.7	1.23	1.08–1.62
Anxiety	92	31.1	1.20	1.10–1.60
Hostility	117	39.5	1.17	1.00–1.50
Phobic anxiety	173	58.4	1.00	1.00–1.29
Paranoid ideation	150	50.7	1.17	1.00–1.33
Psychoticism	119	40.2	1.10	1.00–1.40
Other symptoms	96	32.4	1.57	1.14–1.86
Average factor score	N/A	N/A	1.24	1.11–1.49
Number of positive items	N/A	N/A	20.00	9.00–37.00
Total SCL-90 scores	N/A	N/A	112.00	99.67–134.38

Note: Positive cases of 10 factors: any factor's mean score is more than 2 points (the total score of a factor, divided by the item number of this factor).

Abbreviations: M, median; Q, quartile range; SCL, symptom check list.

the most common psychological symptoms are phobic anxiety, paranoid ideation, and psychoticism, which indicate that psychological symptoms in patients with mild symptoms of COVID-19 cannot be ignored. Current research (Bhattacharjee & Acharya, 2020; Li & Gang, 2020; Poudel & Subedi, 2020; Rogers et al., 2020) has found that the COVID-19 epidemic is hazardous to patients' mental health and may result in the onset of psychiatric illness. The COVID-19 outbreak has caused a range of psychiatric symptoms similar to that of SARS outbreak. Guan et al. (2006) indicated that almost 30% of SARS patients have mental health symptoms, with tension and fear being the main problems. Maunder et al. (2003) also reported that patients with SARS are more likely to experience fear, anger, and loneliness. The possible reason is that after the patients were confirmed with COVID-19, they were isolated for treatment and observation, and could not casually contact the outside world. As a result, many patients had difficulty adapting to the unfamiliar medical environment, were unable to obtain adequate social support from their families, feared infecting their family members, or death from the diseases (Bhattacharjee & Acharya, 2020; Liu et al., 2003). These may generate a series of psychiatric symptoms, such as phobia, generalized anxiety, social phobia, and panic disorder (Arroliga et al., 2005; Lau et al., 2005; Moreau & Zisook, 2002). If healthcare providers cannot help the patients reduce such stressful conditions as quickly and effectively as possible, it may be harmful to the immune system and affect the prognosis and treatment course of the patient (Bailey, 2016). Therefore, healthcare providers should pay attention to such psychological symptoms, and correspondingly stage psychological interventions.

4.3 | The influencing factors of psychological symptoms in patients with mild symptoms of COVID-19

The findings demonstrate that the prevalence of psychological symptoms varies with gender, duration of hospitalization, and current manifestation of physical symptoms. Women and those exhibiting physical symptoms currently are at high risk for psychological symptoms. Being in the middle duration of hospitalization is a protective measure against psychological symptoms in this mildly affected sample. This finding corresponds to previously conducted studies (Pineles & Borba, 2018; Vindegaard & Benros, 2020) which found that women were more likely to suffer from psychological symptoms. Women who have suffered a traumatic event are twice as likely to be diagnosed with posttraumatic stress disorder than men (Garza & Jovanovic, 2017). Some previous studies have suggested that women may have lower tolerance to stress, higher rates of negative beliefs, and poorer behavioural responses to distress compared to men (Pineles & Borba, 2018; Street & Dardis, 2018).

As mentioned, being in the middle duration of hospitalization protects against psychological symptoms. Patients who are in the initial stage of hospitalization run a higher risk of suffering from

psychological symptoms, compared to patients of middle stage of hospitalization. In the initial stage of disease, patients tend to have more psychological symptoms due to fear of an unknown disease prognosis, unfamiliar isolation environment, strict protective measures from healthcare providers, and rigorous treatment procedures (Brooks et al., 2020). As the length of hospitalization increases, patients have more chances to gain disease-related knowledge and understanding of their health condition. They are also more likely to accept the illness, adapt to the medical environment, and increase their confidence in recovery in the next stage of disease.

In terms of physical symptoms, compared with patients who have no significant physical symptoms, patients who are experiencing physical symptoms, especially fever, fatigue, and dyspnoea, have less confidence about the recovery from the disease and are more worried about relapse and facing discrimination, which is consistent with previous studies (Guan et al., 2006). Therefore, we urge the need for a more effective and holistic approach to provide mental health care for high-risk patients, especially while providing health care for the women, individuals in the initial stage of hospitalization, and patients presently exhibiting physical symptoms of COVID-19.

4.4 | Implications for clinical practice

By examining the psychological symptoms, we can better understand the prevalence, characteristics, and possible influencing factors of psychological symptoms of patients with mild symptoms of COVID-19, which has both policy and clinical implications. Firstly, health authorities need to pay enough attention to the psychological symptoms of COVID-19 patients during their hospitalization. Our findings revealed that there were minor COVID-19 patients who still suffered from psychological symptoms. Therefore, health authorities could assign more mental-health professionals to the frontline, as well as publish relevant guidance or regulations to monitor patients' psychological symptoms (Xiang et al., 2020). Online or telephone assistance for screening psychological symptoms and conducting long-term follow-up assessments can help prevent patients from developing more serious psychiatric illnesses (Center for the Study of Traumatic Stress, 2020b; Liu, Yang, et al., 2020; National Health Commission of the People's Republic of China, 2020e).

Secondly, health authorities are recommended to identify high-risk psychological symptoms of COVID-19 patients based on sociodemographic characteristics for psychological interventions during crisis. The present study provides vital guidance for the health authorities to develop targeted psychological support strategies, especially for female patients, those with significant physical symptoms, and in the initial stage of disease. Besides, healthcare providers could apply more effective and urgent care in the initial stage of hospitalization, such as identify patients' psychological symptoms during admission, strengthen communication with the high-risk patients, provide patients with more disease-related information and knowledge, etc. (Liu, Yang, et al., 2020; Center for the Study of

Traumatic Stress, 2020c). Future researches can examine the effectiveness of this.

4.5 | Limitations

There are several potential limitations to consider when interpreting the current results of this study. Firstly, the current study only conducted the survey among patients with mild symptoms of COVID-19 in one *Fangcang* hospital, which may generate selection bias. Future research could consider expanding the sample geographical scope. Secondly, this *Fangcang* hospital mainly treats patients with mild symptoms at present and the sample scope may limit the generalizability of the results. We recommend future research to include other types of patients, such as moderate or severe patients, who could reflect more comprehensively the psychological symptoms of COVID-19 patients. However, the current study can still provide valuable guidance to investigate the mild symptoms patients' psychological symptoms. Thirdly, this study only analysed sociodemographic and clinical characteristic as independent variables of psychological symptoms. Further studies are recommended to consider more possible influencing factors, such as social support, additional mental-health services, personality traits, coping styles, etc. Finally, due to the limitation of the cross-sectional design, further longitudinal studies need to be conducted to investigate the long-term and dynamic psychological symptoms of COVID-19 patients.

5 | CONCLUSIONS

The current study has demonstrated that most patients with mild symptoms of COVID-19 in a *Fangcang* hospital experienced normal mental health in general, according to the Chinese norms. However, 12.8% of patients with mild symptoms of COVID-19 still exhibited psychological symptoms, and phobic anxiety, paranoid ideation, and psychoticism were the most prominent symptoms. Additionally, healthcare providers are recommended to pay attention to female patients, those in the initial stage of hospitalization, and those experiencing physical symptoms, while providing mental-health care. We appeal to provide targeted psychological intervention according to patients' characteristics to avoid more serious psychiatric illness.

6 | ETHICAL CONSIDERATION

The ethics approval was obtained from Institutional Review Board of Behavioral and Nursing Research in School of Nursing of Central South University (no: E202073) before data collection. Prior to filling out any questionnaires, all participants were informed about the purpose of the study and signed an electronic version informed consent form which informed that the whole study process was carried

TABLE 3 The prevalence of psychological symptoms in patients with mild symptoms of coronavirus disease 2019 by characteristics

Variables	Negative cases group (N = 258, 87.2%)		Positive cases group (N = 38, 12.8%)		Chi-squared/Fisher's exact test	p
	N	%	N	%		
Gender						
Male	160	62.0	13	34.2	10.544	0.001[**]
Female	98	38.0	25	65.8		
Age (years)						
≤20	8	3.1	0	0	2.533	0.417
20–40	140	54.3	17	44.7		
41–60	101	39.1	20	52.6		
≥60	9	3.5	1	2.6		
Marital status						
Single	50	19.4	4	10.5	8.331	0.029[*]
Married	200	77.5	29	76.3		
Divorced	6	0.8	4	10.5		
Partner	2	5.4	1	2.6		
Education level						
Primary school	1	0.4	2	5.3	8.439	0.060
Junior middle school	43	16.7	6	26.3		
Senior middle school	53	20.5	10	26.3		
Undergraduate	144	55.8	20	52.6		
Postgraduate or above	17	6.6	0	0		
Occupation						
Student	8	3.1	0	0	7.268	0.251
Medical staff	3	1.2	2	5.3		
Institution or enterprise personnel, e.g., teachers, office workers	117	45.3	16	42.1		
Farmer	1	0.4	0	0		
Freelance	51	19.8	9	23.7		
Unemployed	8	3.1	3	7.9		
Others	70	27.1	8	21.1		
Residence						
City	247	95.7	34	89.5	4.108	0.080
Town	8	3.1	2	5.3		
Countryside	3	1.2	2	5.3		
Average monthly earnings (RMB)						
≤2,000	8	3.1	3	7.9	2.631	0.452
2,001–4,000	51	19.8	9	23.7		
4,001–6,000	68	26.4	9	23.7		
≥6,000	131	50.8	17	44.7		
Duration of hospitalization (days)						
≤10	38	14.7	12	31.6	5.115	0.024[*]
11–20	216	83.7	25	65.8		
≥21	4	1.6	1	2.6		
Family members confirmed with COVID-19						

TABLE 3 (Continued)

Variables	Negative cases group (N = 258, 87.2%)		Positive cases group (N = 38, 12.8%)		Chi-squared/Fisher's exact test	p
	N	%	N	%		
Yes	151	58.5	24	63.2	0.294	0.588
No	107	41.5	14	36.8		
Friends confirmed with COVID-19						
Yes	24	9.3	5	13.2	0.557	0.455
No	234	90.7	33	86.8		
Colleagues confirmed with COVID-19						
Yes	40	15.5	9	23.7	1.605	0.205
No	218	84.5	29	76.3		
Neighbours confirmed with COVID-19						
Yes	28	10.9	3	7.9	0.309	0.578
No	230	89.1	35	92.1		
Whether have physical symptoms currently						
Yes	150	58.1	30	78.9	6.018	0.014[*]
No	108	41.9	8	21.1		
Whether patients' self-perceived symptoms improved						
Improved markedly	151	58.5	16	42.1	4.109	0.219
Improved mildly	64	24.8	14	36.8		
No change	36	14.0	7	18.4		
Worsened mildly	7	2.7	1	2.6		

Note: Personnel of enterprises and institutions include those who work in educational, technical or cultural service institutions, such as teachers and office workers.

Positive cases of psychological symptoms: the SCL-90 total score is more than 160; correspondingly, negative cases of psychological symptoms: the SCL-90 total score is less than or equal to 160.

When we conducted the Chi-square test, if expected count of more than one-fifth of the cells is less than 5 or the minimum expected count is less than 1, we used the Fisher's exact test to calculate the probability.

*p < .05;

**p < .01.

TABLE 4 Binary logistic regression for the factors of influence on psychological symptoms in patients with mild symptoms of coronavirus disease 2019

Variables	β value	SE	Wald value	df	p value	OR value	95% CI
Constant	−2.318	0.500	21.451	1	<0.001	0.098	
Gender							
Female	1.277	0.383	11.134	1	0.001	3.587	1.694–7.598
Duration of hospitalization							
11–20 days	−1.280	0.424	9.102	1	0.003	0.278	0.121–0.639
≥21 days	−0.479	1.203	0.159	1	0.690	0.619	0.059–6.541
Whether have physical symptoms currently							
Yes	1.034	0.430	5.772	1	0.016	2.813	1.210–6.539

Note: Reference for the two-or-more categorical variables. Gender: male as the reference variable; Duration of hospitalization: ≤10 days as the reference variable; whether have physical symptoms currently: have no physical symptoms currently as the reference variable.

Abbreviations: CI, confidence interval; OR, odds ratio.

out completely voluntarily, anonymously and confidentially. Besides, Participants have the rights to decline the study at any time without any penalty.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE; http://www.icmje.org/recommendations/): Study design: JL, YFL and JPZ; Data collection: ZY, LLD and FSW; Data analysis: JL and JZ; Study supervision: XW and RHW; Manuscript writing: JL; Critical revisions for important intellectual content: ANW, JPZ and RHW; Read and agreed on the final version of the manuscript: All authors.

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DATA AVAILABILITY STATEMENT

Research data are not shared.

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