

# Anxiety and related factors in frontline clinical nurses fighting COVID-19 in Wuhan

Ruilin Li, MS<sup>a</sup>, Youlin Chen, BS<sup>b</sup>, Jianlin Lv, MS<sup>c</sup>, Linlin Liu, MS<sup>a,\*</sup>, Shiqin Zong, MS<sup>d</sup>, Hanxia Li, BS<sup>e</sup>, Hong Li, BS<sup>f</sup>

## Abstract

The aim of this study was to examine the anxiety status of the frontline clinical nurses in the designated hospitals for the treatment of coronavirus disease 2019 (COVID-19) in Wuhan and to analyze the influencing factors, to provide data for psychologic nursing.

This study used a cross-sectional survey design and convenience sampling. The questionnaires were completed by 176 frontline clinical nurses. Anxiety was determined using the Hamilton anxiety scale. General data were collected using a survey. Correlation analyses were used.

Among the 176 frontline nurses, 77.3% (136/176) had anxiety. The anxiety scores of the frontline clinical nurse fighting COVID-19 were  $17.1 \pm 8.1$ . Anxiety symptoms, mild to moderate anxiety symptoms, and severe anxiety symptoms were found in 27.3%, 25%, and 25% of the nurses, respectively. Sex, age, marital status, length of service, and clinical working time against COVID-19 were associated with anxiety ( $P < .05$ ).

The frontline nurses working in the designated hospitals for the treatment of COVID-19 in Wuhan had serious anxiety. Sex, age, length of service, and clinical working time against COVID-19 were associated with anxiety in those nurses. Psychologic care guidance, counseling, and social support should be provided to the nurses to reduce their physical and mental burden. Nursing human resources in each province should be adjusted according to each province's reality.

**Abbreviations:** COVID-19 = coronavirus disease 2019, HAMA = Hamilton rating scale for anxiety, SARS = severe acute respiratory syndrome.

**Keywords:** anxiety, coronavirus disease 2019, designated hospitals, frontline nurses, Wuhan

## 1. Introduction

China is a vast country with complicated terrain in various provinces and cities. Major natural disasters, accidents, public health and safety incidents, and diseases and epidemics occur from time to time.<sup>[1]</sup> Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is currently endemic in China,

causing a large number of cases of coronavirus disease 2019 (COVID-19), which can cause severe respiratory disease and death in severe cases. Since December 2019, the virus has been spreading throughout the country and the entire world, and the World Health Organization raised a level 1 alert. As of February 2, 2020, a total of 14,423 cases were confirmed in China, of which 304 died, for a mortality rate of 2.1% in China. Nowadays, person-to-person transmission and aerosol transmission are recognized as transmission ways between nurses and patients and within families. Medical personnel is the core of the rescue team.<sup>[2]</sup> Nurses are always present to the frontline of any public health situation or crisis, and human-to-human transmission and aerosol transmission will not only harm the frontline nursing staff but also bring great psychologic impact. At present, China has a large number of nurses engaged in the battle against COVID-19. Due to the sudden outbreak of SARS-CoV-2, the number of nurses involved in the response was very limited, and most of them did not have enough experience and preparation to deal with it.<sup>[3]</sup>

Disasters always cause psychologic problems of varying degrees.<sup>[4]</sup> COVID-19 was not only a disaster to the Chinese community but also a critical challenge for the medical staff, with its load of detrimental psychologic impacts. Nevertheless, when facing a deadly situation involving a dangerous virus, large numbers of patients, and highly intensive work, psychologic problems of different degrees are bound to occur.<sup>[5]</sup> To fight the psychologic war against this “psychologic epidemic” secondary to COVID-19, it must first be characterized to manage it appropriately. The first of patients with COVID-19 reported exposure to a large seafood and live animal market in Wuhan City, Hubei province, suggesting a potential zoonotic origin.

Editor: Massimo Tusconi.

RL and YC contributed equally to the work.

The authors have no funding and conflicts of interest to disclose.

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

<sup>a</sup> College of Nursing, Guangxi University of Chinese Medicine, Nanning,

<sup>b</sup> Department of Neurology, Guangxi Minzu Hospital, Guangxi, <sup>c</sup> Department of Spleen, Stomach and Liver Diseases, The First Affiliated Hospital of Guangxi University of Chinese Medicine, Nanning, <sup>d</sup> Department of Dermatology, Wuhan No. 1 Hospital, <sup>e</sup> Department of Emergency, Wuhan No. 5 Hospital, <sup>f</sup> Department of Urology, The Third People's Hospital of Hubei Province, Wuhan, China.

\* Correspondence: Linlin Liu, College of Nursing, Guangxi University of Chinese Medicine, Nanning, China (e-mail: lily20190806@gmail.com).

Copyright © 2020 the Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial License 4.0 (CCBY-NC), where it is permissible to download, share, remix, transform, and buildup the work provided it is properly cited. The work cannot be used commercially without permission from the journal.

How to cite this article: Li R, Chen Y, Lv J, Liu L, Zong S, Li H, Li H. Anxiety and related factors in frontline clinical nurses fighting COVID-19 in Wuhan. *Medicine* 2020;99:30(e21413).

Received: 16 February 2020 / Received in final form: 25 May 2020 / Accepted: 19 June 2020

<http://dx.doi.org/10.1097/MD.00000000000021413>

Wuhan city is at the core of the battle against SARS-CoV-2 and is also the hardest-hit area in China. To understand the psychologic state of the first cohort of frontline nurses in the designated hospitals in Wuhan city, we investigated and analyzed their anxiety and the related factors, hoping to provide data for the psychologic intervention of frontline and rescue nurses.

## 2. Materials and methods

### 2.1. Subjects

Frontline nurses in hospitals treating COVID-19 in Hubei province in January 2020 and February 2020 were enrolled. The nurses were from the tertiary hospitals in Wuhan city, Hubei province, that were designated to receive new patients with COVID-19.

This study was approved by the ethics committee of the Guangxi University of Chinese Medicine. Informed consent was obtained from all participants included in the study.

### 2.2. Data collection

Two scales were used to collect the data. The general information questionnaire included sex, age, ethnicity, length of service, professional title, education level, marital status, and clinical working time against COVID-19. The Hamilton rating scale for anxiety (HAMA)<sup>[6]</sup> is the most commonly used clinician-rated measure of anxiety in the treatment studies of depression.<sup>[7]</sup> It consists of 14 symptom-defined elements, and covers both psychologic and somatic symptoms, comprising anxious mood, tension (including startle response, fatigability, and restlessness), fears (including of the dark, strangers, and crowds); insomnia; “intellectual” (poor memory or difficulty concentrating); depressed mood (including anhedonia); somatic symptoms (including aches and pains, stiffness, and bruxism); sensory (including tinnitus and blurred vision); cardiovascular (including tachycardia and palpitations); respiratory (chest tightness and choking); gastrointestinal (including irritable bowel syndrome-type symptoms); genitourinary (including urinary frequency and loss of libido); autonomic (including dry mouth and tension headache), and observed behavior at interview (restless, fidgety, etc). According to the data provided by the scale collaboration group in China, a total score  $\geq 29$  indicated severe anxiety,  $\geq 21$  points indicated obvious anxiety,  $\geq 14$  points indicated anxiety;  $\geq 7$  points indicated possible anxiety, and  $< 7$  points indicated no symptoms of anxiety.

### 2.3. Study design

In this survey, a total of 176 participants completed the survey. For those participants, 176 questionnaires were collected, and all the answers were completed, for an effective recovery rate of 100%.

The questionnaires were made on the network questionnaire platform “Wenjuan Star” and distributed on the platform “WeChat.” Before the investigation, a WeChat group was established to invite the frontline clinical nurses to join the group. The researchers explained in detail the purpose of the survey, the principle of anonymity and confidentiality in the group, required the respondents to truthfully answer according to their actual situation, forwarded the QR codes to the WeChat group, and notified the respondents to fill in and submit it during their rest time.

## 2.4. Statistical analyses

The collected data were analyzed using SPSS 21.0 (IBM, Armonk, NY). Categorical data were expressed as absolute numbers and percentages (%). Continuous data were expressed as mean  $\pm$  standard deviation and analyzed using the Student *t* test, analysis of variance, and correlation analysis. Statistical significance was defined as  $P < .05$ .

## 3. Results

### 3.1. Characteristics of the participants

There were 176 participants included in the study. The characteristics of the frontline clinical nurses working against COVID-19 are shown in Table 1.

### 3.2. Anxiety levels

The average anxiety score of the 176 nurses was  $17.1 \pm 8.1$ , and 77.3% of them had anxiety symptoms.

### 3.3. Univariable analyses of the influencing factors

To determine the factors that influenced the anxiety of the frontline clinical nurses against COVID-19, univariable analyses were performed. The results showed that sex, age, length of service, and clinical working time against COVID-19 were associated with anxiety (all  $P < .05$ , Table 2). The anxiety scores

**Table 1**  
The sociodemographic characteristics of the frontline clinical nurse against COVID-19 (n = 176, %).

Items	n (%)
Sex	
Male	40 (22.7)
Female	136 (77.3)
Age, yr	
20–25	48 (27.3)
25–30	56 (31.8)
30–35	40 (22.7)
35–40	24 (13.6)
$\geq 40$	8 (4.5)
Professional title	
Registered nurse/senior nurse	120 (68.2)
Nurse-in-charge	56 (31.8)
Marital status	
Single	80 (45.5)
Married	88 (50.0)
Divorced	8 (4.6)
Academic credentials	
Specialized subjects	16 (9.1)
Bachelor	136 (77.3)
Master	24 (13.6)
Clinical working time combat COVID-19, wk	
1	48 (27.3)
2	112 (63.6)
2–3	8 (4.6)
$\geq 4$	8 (4.6)
Length of service, yr	
$< 5$	56 (31.8)
5–10	88 (50.0)
10–20	32 (18.2)

COVID-19 = coronavirus disease 2019, SD = standards deviation.

**Table 2**  
**The HARS scores of the frontline clinical nurses against COVID-19 (n = 176).**

Items	HARS ( $\pm$ )	t/F	P
Sex, n (%)		-5.244	.017*
Male	11.2 $\pm$ 5.6		
Female	17.5 $\pm$ 9.6		
Age, yrs		8.064	<.001*
20–25	12.4 $\pm$ 7.5		
25–30	14.1 $\pm$ 6.6		
30–35	13.3 $\pm$ 7.8		
35–40	26.0 $\pm$ 4.6		
$\geq$ 40	36.0 $\pm$ 5.4		
Professional title		-3.533	.051
Registered nurse/senior nurse	12.9 $\pm$ 7.3		
Nurse-in-charge	22.5 $\pm$ 10.0		
Marital status		3.713	.033*
Single	12.4 $\pm$ 7.3		
Married	18.6 $\pm$ 9.8		
Divorced	25.0 $\pm$ 0.0		
Academic credentials		4.005	.076
Specialized subjects	25.0 $\pm$ 5.0		
Bachelor	11.3 $\pm$ 5.6		
Master	11.3 $\pm$ 5.0		
Doctor			
Clinical working time against COVID-19, wk		5.961	.002*
1	10.9 $\pm$ 5.8		
2	14.5 $\pm$ 0.7		
2–3	17.0 $\pm$ 8.7		
$\geq$ 4	36.0 $\pm$ 5.4		
Length of service, yrs		6.879	.003*
<5	25.6 $\pm$ 11.1		
5–10	14.8 $\pm$ 7.0		
10–20	12.6 $\pm$ 7.5		
$\geq$ 20			

COVID-19 = coronavirus disease 2019.

\* Mean correlation analysis was statistically significant ( $P < .05$ ).

in females were significantly higher than that of males ( $P < .05$ ). Older nurses had higher levels of anxiety than younger nurses ( $P < .05$ ). Married nurses had higher levels of anxiety than unmarried nurses ( $P < .05$ ). The longer the clinical hours spent fighting COVID-19, the higher the anxiety level ( $P < .05$ ). The shorter the clinical service, the higher the anxiety level ( $P < .05$ ).

## 4. Discussion

### 4.1. Current situation and causes of anxiety among frontline nurses

The pressure source of nursing work can come from the objective environment as well as from subjective perception.<sup>[8]</sup> The SARS-CoV-2 is a new, highly infectious coronavirus never before encountered by humans. Thus, patients need long-term care by the doctors and nurses, and this will disrupt the normal life and work to a certain extent. At the same time, long-term fights, instability, and uncertainty of patients' condition, and concerns about the health status of patients have a huge impact on the physiology, psychology, and quality of life of the nurses.<sup>[9]</sup> With the outbreak of infectious public health events, most frontline nurses do not know much about the new or sudden infectious diseases and closed management, leading to fear.<sup>[10]</sup> In the present study, 136 (77.3%) frontline nurses had symptoms of

anxiety, and 44 (25%) had severe anxiety, which is consistent with the 72.8% incidence of anxiety and depression symptoms of nurses in previous studies.<sup>[11]</sup> This indicates that the disaster brings serious psychologic problems to the frontline nurses, whose inner trauma is an urgent problem to be solved.

### 4.2. The reasons for psychologic stress response in frontline nurses

The causes for the psychologic response in the frontline nurses mainly include the following aspects.

**4.2.1. The supply of protective equipment is tight, and nurses are insecure and worried about infection.** In the face of COVID-19, the protection requirements for paramedics are very strict. Various papers and textbooks plainly describe wearing level-D protective clothing against respiratory viruses, but in practice, this is not a simple task. It takes at least 5 minutes to wear it, and taking off level-D protective clothing is even more difficult than putting it on. To save the protective clothing and the time to change protecting clothing, nurses wear diapers to work, are unable to drink water, and are unable to go to the toilet. Because adult diapers do not contain much, the nurses are limited to the consumption of small amounts of milk, which will aggravate the anxiety and depression of nurses. Our research showed that female nurses were more anxious than male nurses. The physiologic characteristics of a female are divided into 2 aspects: physiologic and psychologic. Physically, females are not as physical as men; psychologically, females' nursing personnel were slightly more resilient than males, and females are more sensitive than males. This physical discomfort exacerbated the female nurse's anxiety.

Our research shows that the longer the nurses work at the frontline against COVID-19, the more anxiety they experience. Because they did not know the virus, the source of infection, and transmission, and they lacked awareness of prevention and control in the early stages, the nurses had high levels of anxiety. Despite the improving knowledge of COVID-19, the psychologic pressure of the nurses was increasing. Anxiety among nurses has been exacerbated by the recent discovery that COVID-19 can also be transmitted through aerosols. In this information age, a large number of unverified statements are reported in the news, causing panic among the public. At first, a large number of patients rushed to the hospital, aggravating the burden of the first cohort of designated hospital nurses. In such an environment, the anxiety of the frontline nurses in Wuhan hospitals, which have been exposed to patients with COVID-19 for the longest time and have the largest number of patients, will be further intensified. According to a study, 100% of the nurses in the infection department of the emergency department requested to be transferred, because they were concerned about the threat of environmental safety to health.<sup>[12]</sup>

The results also showed that marital status was another relevant factor. The main reason is that nurses worry about spreading the virus to their families, or that they do not have the equipment or medication to treat them. There were nurses or family members of nurses who are infected, who had no beds, no hospitalization, and no privilege.

**4.2.2. Heavy workload.** In the face of anxiety, the body can relieve stress through its own mechanism. Nevertheless, the frontline nurses were in a state of overload and super-intense work, constantly under stress, and on the verge of physical and

psychologic limits. The intensity and strain of the work of the medical staff in the isolation wards during the response to SARS was one of the main factors for psychologic stress.<sup>[13]</sup> From the perspective of sex, women's physical ability is not as good as men's, and the excessive workload inevitably leads to women's greater anxiety than men.

Another factor was that the longer they spent at the frontline, the more anxious and depressed the nurses were. The frontline nurses were scheduled in the APN mode, and each shift lasts 8 hours. Due to a large number of patients, unstable conditions, and rapid changes in the condition, nurses actually worked an average of 10 hours per day, and some nurses worked up to 40 hours per week. Nurses are expected to work in a meticulous, long, and focused environment, which is another major contributor to anxiety, which is supported by a previous study.<sup>[14]</sup> In the face of such a huge workload and a strong source of infection, many frontline nurses were infected, some have fallen ill, suspected infected nurses were isolated, the number of nurses able to work normally was declining, and the workload was increasing. Long-term overload and super-intense work make nursing staff in the state of constant stress, on the verge of physical and psychologic limits. In addition to preventing infection, mental health is crucial. Only by maintaining a healthy state of mind can we put ourselves into work efficiently.

#### **4.2.3. Less experience in dealing with public emergencies.**

In the face to the patients suddenly increasing fever and human resource gap, hospital nursing staff from other departments were deployed, the non-nursing staff was also deployed, leading to less experienced staff having to deal with COVID-19, further increasing stress and psychologic pressure. Our results showed that age and length of service were 2 related factors influencing the anxiety of frontline nurses. By comparing the anxiety of the frontline nurses of different working ages, it was found that the incidence of anxiety in nurses with low seniority was higher, while the incidence of anxiety in nurses with high seniority was lower, which may be related to long-term psychologic stress and clinical knowledge. The results show that most frontline nurses were young and middle-aged, mainly female, and with experience of 1 to 10 years (81.8%). They lack experience, and, in the face of such a sudden disaster, their psychologic fear, psychologic endurance will be poor. As someone once said: "they are just a group of children, changed in a suit of clothes, the appearance of scholars predecessors, healing and saving people, and death rob people!"

**4.2.4. Guidance of public opinion.** This outbreak is significantly different from the information transmission speed of SARS in 2003. In the present outbreak, the information transmission speed is faster, but the authenticity of a lot of information cannot be guaranteed, which aggravates people's suspicion and worry and easily causes fear, which further aggravates the psychologic burden of the nurses.

### **4.3. Strategies to counter anxiety among first-line nurses**

**4.3.1** As a professional medical worker, they first need to do is acquire a correct understanding of COVID-19 and avoid the rumors on the Internet. It is also essential to be able to disseminate knowledge accurately and not panic in the face of the disease. To carry out authoritative interpretation and education in a timely manner, the frontline nurses can update their knowledge of COVID-19 timely through professional education in 5 minutes at

the time of shift change or authoritative release of WeChat groups, compilation manual of data, etc, so that the frontline nurses can know clearly that what they have done is the best treatment plan to achieve consistent thinking, consistent action, confident, and orderly in their work. In this way, the anxiety caused by fear, remorse, and guilt is eliminated.

**4.3.2** COVID-19 knowledge training should be taken up with their jobs. They should carry out preventive interviews to discuss their inner feelings with the appropriate resources for healthcare workers to manage their stress.

**4.3.3** After entering the frontline of the epidemic, scientific, rational, and clear management and division of labor should be strengthened, with clear working standards and targets. Unnecessary repetitive work should be reduced, and reasonable and effective incentive strategies should be established. Reasonable schedule, appropriate relaxation and rest, and adequate sleep and diet should be emphasized. Good interpersonal relationships, including medical care relationship, doctor-patient relationship, the nurse-patient relationship should be established and maintained to improve medical tasks and achieve medical goals by establishing a harmonious working atmosphere.

**4.3.4** In the face of an outbreak, everyone has more or less negative emotions, especially healthcare workers, directly facing the patients. When there are negative emotions, we should reasonably face and accept the emergence of these emotions, and fully accept the rationality of the emergence of these emotions. Passing over and self-blame because of these emotions will eventually lead to a vicious circle of emotions and aggravation. Negative emotion management should be done well, as follows.

**4.3.4.1** When emotions are difficult to control and affect work status, it is recommended to leave the stressor temporarily if possible. For example, the sense of helplessness in the face of illness, in the face of criticism from patients or family members. Taking time off can help calm emotions quickly and allowing a return to work.

**4.3.4.2** Learning the correct expression, confiding to colleagues and friends around, making daily scheduled calls and information exchange with family members, and writing down the emotions on paper and then tearing up the paper into the trash can might help emotional catharsis. Crying is not a characteristic of the weak. Tears can be a source of emotional catharsis and relaxation, conducive to the maintenance of mental health. In addition, patients with very severe anxiety should use this time for possible psychologic treatment.

**4.3.4.3** When taking a break from work, the nurses should try not to get information about the epidemic, should avoid relevant materials and circle of friends, chat with the people around about some irrelevant topics, and pay attention to nutrition, appropriate physical exercise, and relaxation.

**4.3.4.4** During work, the nurses should focus on doing a good job in each medical process, focus on helping everyone around, affirm the value of each work, and timely encourage and affirm the work of their colleagues. In particular, they should avoid feeling guilty for a small mistake or blame others for mistakes. What is most needed in emergency work is mutual help and awareness of making up for it. In some powerless occasions, the nurses should tell themselves that they are not omnipotent, that their energy is limited, that it is impossible to do all on their own to help everyone around them, and to rely on partners.

**4.3.5** Whenever possible, they should try to keep in touch with their family and the outside world. They should control the situation of their family and friends to alleviate the worry about

family and friends. They should be aware of the outside world and reduce the feelings of isolation.

4.3.6 They should build a place in their heart that is their own and cannot be disturbed by outsiders or living things. It must be a safe environment for use and control. It can be a familiar bed, a small yard, a small room, etc. In the process of memory, we are already feeling rest and relaxation. In the process, the nurses can mentally direct themselves to suggest to themselves “I am particularly comfortable and safe in that place, and this place is bounded and relaxed,” to stimulate and evoke physical sensations, and to allow the body to fully relax and rest before resuming the fight.

4.3.7 For relaxation training, they should lie flat on a bed in a comfortable position with one hand on their abdomen and the other on their chest. They should exhale slowly to feel that their lungs have enough space to breathe deeply. They should breathe in slowly through their nose until they can breathe no more, then slowly exhale through the mouth, with the thought that all the annoyance pressure is exhaled with the dirty gas. This should be repeated for 10 minutes with smooth, soothing music.

In summary, 77.3% of the nurses working at the clinical frontline against COVID-19 had anxiety symptoms. About 25% of the frontline nurses had severe anxiety symptoms, indicating the emotion and burden of the nurses are not optimistic. Sex, work experience, and frontline care time were major influencing factors of frontline clinical nurses' emotions. These results indicate that clinical nurses should receive psychologic care guidance, counseling, and social support to improve their mental health.

#### 4.4. Limitations

The research time was limited, and the number of participants was limited. Therefore, there are some limitations in the investigation of the psychologic state of the frontline medical workers.

#### Author contributions

Youlin Chen contributed equally to this study and are co-first authors. Study design: Ruilin Li, Jianlin Lv and Linlin Liu. Data

collection and analysis: Youlin Chen, Shiqin Zong, Hanxia Li, Hong Li and Linlin Liu. Supervision: Linlin Liu, Jianlin Lv and Youlin Chen. Statistics: Ruilin Li, and Linlin Liu. Manuscript writing: Ruilin Li. Manuscript revision: Linlin Liu. Approval of the manuscript: all authors.

#### References

- [1] Fan T, Jiang C. Research progress on the construction of disaster rescue teams. *Dangdaihuishi* (On the ten-day) 2017;6:17–8.
- [2] Lu N, Sang Y, Li L. Knowledge of disaster relief among nursing staff: Situation and countermeasures. *Chin J Disaster Med* 2018;6:665–9.
- [3] Zhang H, Lu H, Ma W. Investigation on mental stress reaction of cibiliannurese in a military hospital to earthquake disasters. *J Nurs Sci* 2014;29:13–4.
- [4] Guo C, Zhao Y, Yang F. Long-term effects of disaster exposure in early life on mental health throughout population life cycle. *Chin J Dis Control Prev* 2019;23:1404–8.
- [5] Zhang H, Lu H, Ma W. Survey on psychological stress response of civilian nursing staff in military hospital to earthquake disaster. *J Nurs Sci* 2014;29:13–4.
- [6] Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol* 1959;32:50–5.
- [7] Ionescu DF, Niciu MJ, Richards EM, et al. Pharmacologic treatment of dimensional anxious depression: a review. *Prim Care Companion CNS Disord* 2014;16:
- [8] Lin L-h, Xu Q-r, Zhang L-p, et al. The study of relationship among stressor, coping style and anxiety situation of infectious disease nurse. *J Nurs Admin* 2018;18:282–5.
- [9] Caro CC, Mendes PV, Costa JD, et al. Independence and cognition post-stroke and its relationship to burden and quality of life of family caregivers. *Top Stroke Rehabil* 2017;24:194–9.
- [10] Li X, Sun L, Shang Y. A qualitative study on the psychological state of nurses in emergency banks for infectious diseases. *J Taizhou Poly Coll* 2018;18:67–70.
- [11] Xu M, Zhang Y. Psychological status survey of first clinical first-line support nurses fighting against pneumonia caused by a 2019 novel coronavirus infection. *Nurs Res China* 2020;34:1–3.
- [12] Huang M, Zhao D. General hospital infection nurse request for post transfer and reasons for resignation. *Int Med Health Bull* 2010;16:621–3.
- [13] Gao X, Dong S, He W. Experience of mental state and adjustment measures of SARS ward nurses. *J General Hospital Air Force* 2003; 19:177–8.
- [14] Liu J, Wang W, Gao W. A survey of psychological health state of medical and nursing staffs of fever out -patient clinic in military hospitals during SARS epidemic period and analysis of its related factors. *Nurs Res China* 2004;3:220–2.