ANALYSIS OF EMOTIONAL STATE AND ASSOCIATED FACTORS IN PATIENTS WITH FEVER DURING ISOLATION STAY IN THE COVID-19 PANDEMIC

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ABSTRACT

Introduction: The aim of the present study was to understand the emotional state of patients who were isolated and observed for fever during COVID-19 and to analyze associated factors.

Materials and methods: A total of 260 patients with fever who were admitted to the fever specialist outpatient clinic of the Third Hospital of Shijiazhuang, Hebei Province during the period from early February to the end of March 2020 were selected as the study objects. The basic condition questionnaire, the Hamilton Anxiety Scale, and the Hamilton Depression Scale were adopted as the research tools. In total, 223 valid questionnaires were returned. The sample population was composed of 131 males and 92 females, with an average age of 42.87 ± 21.03 years. The psychological stress status of this febrile population during the isolation period was investigated.

Results: The detection rate of problems related to psychological stress among the isolated individuals was high, with anxiety and depression showing the highest incidence rates (33.6% and 16.1%, respectively). The results of the one-way ANOVA analysis showed that age, educational background, marital status, job status, and isolation duration were all correlated with anxiety and depression.

Conclusion: The isolated population showed a certain amount of stress, with the most frequently observed conditions being anxiety and depression. Health care workers should predict possible psychological problems according to the general situation of each patient and provide targeted psychological guidance and intervention to guide isolated patients to improve their psychological response to the crisis.

Keywords: COVID-19, Fever, Isolation, Psychological stress, Anxiety, Depression.

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Introduction

Since the 1970s, the number of new infectious diseases has increased in many parts of the world, and more than 30 new infectious diseases have been identified[1]. In December 2019, a case of novel coronavirus-infected pneumonia was identified in Hubei Province, China. This was followed by a significant increase in the number of patients[2]. with the virus spreading first to many provinces (municipalities, autonomous regions, and special administrative regions) in China and then rapidly across the rest of the world[3]. The World Health Organization officially named this disease "coronavirus disease 2019" (COVID-19) on February 11, 2020[4,5]. It is stipulated by The Law of the People's Republic of China

on the Prevention and Control of Infectious Diseases that COVID-19 is a category B acute respiratory infectious disease and is managed as a category a infectious disease[6].

The COVID-19 pandemic is a public health emergency; the infection is strong and spreading at a rapid rate, and there is no specific treatment. Therefore, patients can easily develop tension and anxiety, leading to acute stress disorder, traumatic stress disorder, depression, and other psychological disorders[7]. Psychological interventions are an important component of public health emergency response that cannot be ignored. Studies have shown that more than 58% of people experience psychological problems during public health emergencies[8]; therefore, there is a need to focus on psychological interventions to prevent mental health problems in isolated patients[9]. The researchers' hospital is the first designated admission hospital for patients with fever in Shijiazhuang. Patients may be admitted to a single room in the fever ward, and various psychological problems may develop during the period of isolation. The aims of the present study were to observe and interview febrile patients who were kept in isolation during the period of prevention and control of COVID-19, to identify any abnormal psychological and emotional issues present in these isolated patients, and to provide appropriate and timely psychological and pharmacological interventions.

Objects and methods

General materials

A total of 260 patients with fever who were admitted to the fever specialist outpatient clinic of our hospital between early February and the end of March 2020 were selected as the study objects. From among the questionnaires distributed to these patients, 223 valid responses were returned. The sample included 131 males and 92 females, with an average age of 42.87 ± 21.03 years.

The inclusion criterion was that the patients were willing to participate in the study voluntarily.

The exclusion criteria were as follows:
• patients with a clear history of residence in Wuhan;
   • patients with severe mental disorders; and
   • patients with cognitive impairment;
   • people who have ever suffered from any mood disorder treated with drugs and / or psychological therapy.

The study was conducted in accordance with the Declaration of Helsinki (as was revised in 2013). The study was approved by Ethics Committee of The Third Hospital of Hebei Medical University and informed consent was taken from all the patients.

Investigation methods

The questionnaire was available in both electronic and paper formats. Patients could access and fill in the electronic questionnaire by scanning a quick response code that was placed in the observation ward. For patients without smartphones, the paper version of the questionnaire was administered in person by a psychological surveyor. The retrieved questionnaires were collected by systematically trained psychologists.

Questionnaires
• The basic information section of the questionnaire covered the patient's general information: gender, age, marital status, religion, occupation (student, civil servant, entrepreneur, self-employed, freelancer, or retired), educational background, and whether family members were isolated or not.
• The Hamilton Depression Scale, which was compiled by Hamilton in 1960, is the most frequently used scale in the clinical assessment of depressive status (Handbook of Psychiatric Assessment Scales, Zhang Mingyuan, ed. Hunan Science and Technology Press, 143–148) (10). The 24-item version was adopted in the present study, with a total score of ≥ 35 classified as severe depression, 8–20 as mild to moderate depression, and ≤ 8 as without depressive symptoms.
• The Hamilton Anxiety Scale was compiled by Hamilton in 1959 for the clinical assessment of the severity of anxiety symptoms (Handbook of Psychiatric Assessment and Quantification Scales, edited by Zhang Mingyuan, Hunan Science and Technology Press, China 181–183) (11). The scale contains 14 items, with a score of ≥ 29 regarded as severe anxiety, 14-21 as significant anxiety, and ≥ 7 as possible anxiety.

Statistical analysis

The SPSS data processing software was adopted for statistical analysis of the general demographic data and clinically relevant indicators. Differential analysis of the total anxiety score and total depression score were performed on two dimensions of the mood questionnaire under the demographic variables. One-way ANOVA or independent sample t-testing was used, and $p < 0.05$ was considered statistically significant.

Results

Number of patients detected

There were 75 patients with anxiety levels above moderate, representing a detection rate of 33.6%, and 36 patients with obvious depression, representing a detection rate of 16.1%. These figures are significantly higher than the domestic norm.

Analysis of factors associated with anxiety and depression.

No significant effect of gender was observed in anxiety or depressive symptoms (p > 0.05) (Table 1).

Gender	N	Total anxiety score	Total depression score
Male	131	39.11±13.89	38.68±15.85
Female	92	40.61±14.41	41.85±16.74
t		-0.781	-1.434
p		0.436	0.153

Table 1: Comparision of the results of anxiety and depression in different genders.

As shown in Table 2, the one-way ANOVA analysis revealed a significant difference (p < 0.05) between the total anxiety scores in patients of different ages. The post-hoc test showed that the lowest total anxiety scores were found in those under 18 years old, while the highest were found in those with aged 51-60 years. The one-way ANOVA analysis also revealed a significant difference (p < 0.05) between the total depression scores for patients of different ages. The post-hoc test showed that the total depression score in those aged 18-40 years was lower than that in those aged >41 years.

Age	N	Total anxiety score	Total depression score
Under the age of 18 years	14	27.41±4.34 a	27.95±5.49 a
18-30 years	74	31±7.33 ab	30.02±8.52 a
31-40 years	40	33.94±9.34 b	32.56±8.69 a
41-50 years	23	50.43±9 cd	47.83±10.12 b
51-60 years	27	55±11.36 d	54.77±15.21 b
Over the age of 60 years	45	48.44±15.04 c	53.86±17.98 b
F		41.092	38.420
p		0.000	0.000

Table 2: Comparison of the results of anxiety and depression in different ages.
Note: a, b, c, and d denote subsets of the same kind, as follows.

As shown in Table 3, the one-way ANOVA analysis revealed a significant difference (p < 0.05) between the total anxiety scores for patients with different marital statuses. The post-hoc test showed that the risk of depression and anxiety was relatively high for married and divorced patients, while there was no difference between the two marital status.

As shown in Table 4, the one-way ANOVA analysis revealed a significant difference (p < 0.05) between the total anxiety and depression scores for patients with different occupations. According to the

post-hoc test, young students had the lowest total anxiety and depression scores while retired patients had the highest total anxiety and depression scores.

Marital status	N	Total anxiety score	Total depression score
Married	150	44.07±14.46 b	44.53±16.74 b
Unmarried	71	30.4±6.81 a	30.09±8.73 a
Divorced	2	45.63±25.63 b	50.63±36.24 b
F		28.439	23.363
p		0.000	0.000

Table 3: Comparison of the results of anxiety and depression in different marital status.

Occupation	*N*	Total anxiety score	Total depression score
Unemployed	28	41.34±16 bc	44.42±18.32 bc
Student	21	28.39±5.81 a	28.81±7.61 a
Staff	80	35.44±11.47 ab	33.8±11.72 ab
National civil servant	10	42.63±12.89 bc	40.25±10.4 abc
Enterprise manager	6	35.42±9.21 ab	36.88±9.58 ab
Self-employed, freelancer	36	43.16±15.26 bc	42.4±18.55 abc
Retired	42	49.49±13.26 c	52.74±16.24 c
F		9.056	10.582
p		0.000	0.000

Table 4: Comparison of the results of anxiety and depression in different occupations.

As shown in Table 5, the one-way ANOVA analysis found that there existed a significant difference (p < 0.05) between the total anxiety scores for patients of different current statuses. According to the results of the post-hoc test, anxiety and depression were more prominent on the second and third days of hospitalization and gradually returned to normal by one week after discharge.

Current status	N	Total anxiety score	Total depression score
The first day of hospitalization	89	39.49±12.59 b	39.96±14.33 b
The second to the third day of hospitalization	72	44.01±16.11 b	44.5±19.21 b
More than three days of hospitalization	22	41.88±14.65 b	41.19±17.57 b
Within one week after discharge	2	40.63±16.79 b	36.88±15.03 ab
Within one to two weeks after discharge	16	28.28±2.54 a	27.58±3.14 a
More than two weeks after discharge	22	32.78±10.42 a	33.47±11.27 a
F		5.033	3.966
p		0.000	0.002

Table 5: Comparison of the results of anxiety and depression in different current status.

As shown in Table 6, the independent sample t-test revealed that there existed a significant difference (p < 0.05) in the total anxiety scores for patients with different educational backgrounds. By comparing the mean values, it was found that the total anxiety score in patients with education to an undergraduate level or above was lower than that of those with a college degree and below. This indicated that the more highly educated population were able to adjust their psychological state appropriately or were more able to accept the emotional instability caused by their illness or the temporary limitations on their activity.

Educational background	N	Total anxiety score	Total depression score
College and below	180	40.57±14.67	41.18±17.16
Undergraduate and above	43	36.22±10.83	35.00±10.53
t		2.196	3.011
p		0.031	0.003

Table 6: Comparison of the results of anxiety and depression in different educational background.

Discussion

Specific treatment for COVID-19 is currently lacking worldwide[12-16]. Fear is a very normal human reaction when faced with a life-threatening public event. When the object of fear presents a great deal of unreliability and uncertainty, it is likely to lead to psychological tension and shake the cornerstone of patients' mental stability and motivation to survive, which is the essence of anxiety.

It was found in the present study that patients over 60 years of age were prone to developing significant depression, manifested by silence, depressed mood, weeping, decreased appetite, insomnia, and early awakening; these findings are consistent with most existing studies. The older patients in our sample were in poorer health, less likely to use social networks, less able to keep abreast of the current epidemic control situation, and more likely to make negative assessments and become depressed by fever and other discomforts, than the younger patients.

Patients over the age of 40 years old had prominent anxiety, which may be attributable changes in social roles, disruption of their normal work and life, and uncertainty about their illness. This anxiety often manifested as being tense, and some patients exhibited obsessive-compulsive thoughts and washed their hands repeatedly. The accompanying physical symptoms included rapid heartbeat, dizziness, difficulty in falling asleep, early awakening, and an abnormal increase in complaints. For example, when the medical staff talked to one patient, he repeatedly urged them to stay away as well as asking when his nucleic acid test results would be available and whether he had COVID-19.

Most of the febrile patients admitted to the observation unit during the study period were experiencing varying degrees of fear due to a lack of understanding of COVID-19, which is highly contagious in nature and displays rapid progression and severity. Closed environments can exacerbate feelings of fear, isolation, and helplessness. The high mortality rate for patients infected with COVID-19 also caused the isolated patients to think about the possible adverse outcomes, to feel an urgent need to contact their loved ones, and to experience a strong fear of dying, accompanied by physical symptoms such as rapid heartbeat and excessive attention to cough symptoms. Some patients, did not understand the necessity of being quarantined and observed because they did not think they had been in contact with any infected patients and had not been to an infected area; therefore, they would sometimes lose their psychological balance for a while and behave aggressively, including arguing with the medical staff, throwing things, and trying to exit by force. There were also a few febrile patients who completely denied the possibility of becoming infected with COVID-19, who expressed refusal to be isolated, unwillingness to take the necessary precautions, and non-cooperation with treatment and care.

Psychological interventions may help to mitigate the harmful effects of crisis events on individuals and help them to regain psychological balance as quickly as possible. For example, disaster mental health services played an important role in people's recovery following the 9/11 attacks in the United States and the Wenchuan Earthquake in China (17). Fear, anxiety, and other negative psychological states may lead to a weakened immune system, and one of the countermeasures that can help to eliminate fear is to keep the patient informed. Caregivers need to take the time to listen patiently to the anxieties and concerns of their patients while they are working and, during the current pandemic, to explain the prevention and treatment of COVID-19 in light of this particular fear. Improved communication might help patients to build up their self-confidence and bring them to understand that relying on social and family support is the best way to overcome depression.

In terms of provision of mental health services, it is recommended that an integrated health care team, including physicians specialized in the infectious disease, specialists, psychologists, and nurses, should be established to provide health education and follow-up for the needs of patients at every stage of treatment, from hospitalization to discharge. Nurses should strictly abide by the nursing code of practice, try to avoid patients suffering unnecessary pain during examinations and treatment, patiently and meticulously explain nursing measures and precautions to the patients, keep abreast of changes in the conditions, and keep patients informed of developments in a timely manner. Scientific and effective communication should be carried out by providing updates and information materials about COVID-19 and official information about the current progress of research on the disease in the wards to eliminate the

"suspicion of illness" in patients. For those with depression, anxiety, and other psychological disorders, psychological interventions and guidance should be administered in a timely manner, using paper-based and electronic psychological education materials to carry out individualized treatment according to the different characteristics of each patient so as to relieve psychological pressure, reduce anxiety and depression symptoms, and improve quality of life.

Conclusion

COVID-19 was a sudden disaster, and febrile patients isolated for observation during the COVID-19 epidemic were a particular group of patients with specific psychological problems. This required the health care workers in the unit to provide improved psychological care while doing their daily work. Nursing staff should help patients to overcome psychological problems by offering a high degree of empathy and maintaining a strong sense of their responsibility to understand and meet each patient's psychological needs. Using psychological theory as a guide, medical staff should try to influence or change the psychological state and behavior of patients through their speech, behavior, expression, attitude, posture, etc., in order to reduce or eliminate the psychological impact of fever and pain on patients and thus help them to establish a mental state that is most conducive to treatment and recovery.

References

1) Weiss RA, McMichael AJ. Social and environmental risk factors in the emergence of infectious diseases. Nat Med. 2004; 10(12 Suppl):S70-S76. doi:10.1038/nm1150

2) Bogoch II, Watts A, Thomas-Bachli A, Huber C, Kraemer MUG, Khan K. Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel. J Travel Med. 2020; 27(2):taaa008. doi:10.1093/jtm/taaa008

3) Munster VJ, Koopmans M, van Doremalen N, van Riel D, de Wit E. A Novel Coronavirus Emerging in China - Key Questions for Impact Assessment. N Engl J Med. 2020; 382(8) :692-694. doi:10.1056/NEJMp2000929

4) Zhu N, Zhang D, Wang W, et al. A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med. 2020; 382(8): 727-733. doi:10.1056/NEJMoa2001017

5) WHO. WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. (2020-02-15). https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020.

6) Seventh Edition of coVID-19 Diagnosis and Treatment Protocol. National Health Commission of the People's Republic of China. (2020-03-03). http://www.nhc.gov.cn/yzygj/s7653p/202001/4294563ed35b43209b31739b-d0785e67.shtml.

7) Zao GQ, Wang YG, Wang YQ, et al. Psychological Crisis Intervention in Disasters - A Psychiatric Perspectiv. Advances in Psychological Science. 2009;19(7):489-494. https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2009&filename=XLXD200903005&v=9TK5GaGzTuPsg6xHw7o5w2SCWjVkhDEWGDz5vyH7wh6ZvJlQOr1gmpnb5fnP4vN5

8) Y L, Wang ZC, Jiang ZK, et al. Advances in Research on Psychological Interventions in Public Health Emergencies. Chinese Journal of Public Health. 2010; 26(07): 929-930.

9) Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China (published correction appears in Lancet. 2020 Jan 30). Lancet. 2020; 395(10223): 497-506. doi:10.1016/S0140-6736(20)30183-5

10) Taylor HO, Taylor RJ, Nguyen AW, Chatters L. Social Isolation, Depression, and Psychological Distress Among Older Adults. J Aging Health. 2018; 30(2): 229-246. doi:10.1177/0898264316673511

11) Lung FW, Lu YC, Chang YY, Shu BC. Mental Symptoms in Different Health Professionals During the SARS Attack: A Follow-up Study. Psychiatr Q. 2009; 80(2): 107-116. doi:10.1007/s11126-009-9095-5

12) Metlay JP, Waterer GW, Long AC, et al. Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. Am J Respir Crit Care Med. 2019;200(7):e45-e67. doi:10.1164/rccm.201908-1581ST

13) Laboratory diagnostics for novel coronavirus. WHO 2020 (accessed February 6th, 2020).

14) Jin NN, Zuo YR, Zhang X, et al. Intervention analysis of psychological anxiety among 138 college isolated students during SARS. Chinese Mental Health Journal. 2003(09):598.https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2003&filename=ZXWS200309004&v=3SQEdn1yUm-1k1EssVYy9MZ8mikIXK7RYp2%25mmd2BK%25mmd2F%25mmd2Fbic1JrXArb4K6El7i5wDOBfpOg

15) Lei H, Li Y, Xiao S, et al. Routes of transmission of influenza A H1N1, SARS CoV, and norovirus in air cabin: Comparative analyses. Indoor Air. 2018; 28(3): 394-403. doi:10.1111/ina.12445

16) Otter JA, Donskey C, Yezli S, Douthwaite S, Goldenberg SD, Weber DJ. Transmission of SARS and MERS coronaviruses and influenza virus in healthcare settings: the possible role of dry surface contamination. J Hosp Infect. 2016;92(3):235-250. doi:10.1016/j.jhin.2015.08.027

17) Stoil, Michael J. Post-9/11 Lessons in Behavioral Care Disaster Response. Behavioral Health Management, 2003; 23(6) :12-13.

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