The psychological effects of nursing interventions on patients with suspected COVID-19 during isolation

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Background: To investigate the psychological characteristics of patients with suspected coronavirus disease 2019 (COVID-19) during isolation and to evaluate the effects of psychological nursing interventions.

Methods: A total of 137 patients with suspected COVID-19 were assessed using the 7-item Generalized Anxiety Disorder Scale (GAD-7), the 9-item Patient Health Questionnaire (PHQ-9), and the Trait Coping Style Questionnaire (TCSQ). Psychological nursing intervention measures were implemented, after which the patients were re-evaluated.

Results: Before intervention, the rates of anxiety and depression among the patients with suspected COVID-19 were 46.72% and 48.20%, respectively. After intervention, statistically significant reductions were observed in the GAD-7 and PHQ-9 scores (both P<0.05). Before intervention, the TCSQ positive and negative coping scores were 31.07±5.25 and 28.78±6.72, respectively, compared with 36.40±5.93 and 24.60±5.99, respectively, after intervention; these differences were statistically significant (both P<0.01). Before and after intervention, the patients' GAD-7 and PHQ-9 scores were negatively correlated with the positive coping score but positively correlated with the negative coping score.

Conclusions: For COVID-19 or similar public health emergencies, timely and flexible appropriate psychological intervention and counseling is crucial. Correct implementation of psychological intervention methods can effectively relieve patients' negative emotions, and play an important role in assisting patients during the isolation period.

Keywords: Coronavirus disease 2019 (COVID-19); suspected patients; isolation; psychological care

Introduction

Coronavirus disease 2019 (COVID-19) is currently spreading around the globe (1). It is a class B acute respiratory infectious disease resulting from infection with severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) (2). With rapid transmission and strong infectivity, COVID-19 quickly became a pandemic (3).

Designated fever clinics are one of the main modes of screening for COVID-19. As one of the designated fever

clinics in Tianjin, China, Tianjin Third Central Hospital has set up an isolation ward to provide patients suspected with COVID-19 with sampling and clinical treatment, as well as a place to await their pharyngeal test results.

In the face of the sudden epidemic, isolated patients not only have physical problems, but they are also prone to anxiety, depression, and other psychological problems (4). Patients in isolation not only hope to receive the best treatment for their diagnosis, but they also hold high expectations and demands for psychological care (5,6). Therefore, to ensure its patients are supported successfully throughout the isolation treatment period, Tianjin Third Central Hospital provides psychological nursing care.

In this paper, the psychological characteristics of patients with suspected COVID-19 infection were analyzed during isolation. Subsequently, nursing interventions were implemented to relieve the psychological pressure felt by the patients in order to provide a basis for follow-up clinical nursing research and ensure the safety of patients during isolation.

This study used the General Anxiety Scale (GAD-7 score), the Patient Health Questionnaire Depression Scale (PHQ-9 score), and the Trait Coping Style Questionnaire (TCSQ score) to conduct psychological evaluations of 137 suspected COVID-19 patients, and take corresponding measures. After the intervention of psychological nursing measures, the patient's mental state was evaluated again, and it was found that the above several scales can be used to evaluate the mental state of isolated patients, and the corresponding nursing measures can improve the patient's mental state. This study provides a new theoretical basis for the evaluation measures of the mental state of isolated patients. We present the following article in accordance with the STROBE reporting checklist (available at http://dx.doi.org/10.21037/apm-21-516).

Methods

Patients

Patients with suspected COVID-19 infection who were admitted to the isolation ward of Tianjin Third Central Hospital between January 25 and February 29, 2020 participated in this research. The inclusion criteria for patients were: (I) suspected with COVID-19 and admitted to the isolation ward during the epidemic; (II) aged ≥15 years old; (III) able to communicate clearly with no mental impairment; (IV) volunteered to participate in the investigation. The exclusion

criteria were: (I) patients with a previous diagnosis of mental illness; (II) patients who were physically weak and unable to complete the questionnaire. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). This study has been approved by the Ethics Committee of Tianjin Third Central Hospital (No. bd2020111), and all enrolled patients signed informed consent.

Research tools

Generalized Anxiety Disorder-7 (GAD-7)

The GAD-7 scale consists of 7 items designed to gauge the extent to which patients suffer from feelings such as nervousness and worry. Each item is scored on a scale of 0 to 3 points (0= none at all, 1= a few days, 2= more than a week, 3= almost every day), with a total score of 0 to 21 points. The severity of psychological distress is classified according to 4 standard thresholds: minimal or none (0 to 4 points), mild (5 to 9 points), moderate (10 to 14 points), and severe (≥15 points). This scale has high reliability and validity, and is suitable for a wide variety of people.

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 comprises 9 items and is used to assess the frequency at which patients experience depressive symptoms. Each item is scored on a scale of 0 to 3 points (0= none, 1= a few days, 2= more than a week, 3= almost every day), with a total score range of 0 to 27 points. The severity of psychological distress is classified according to the standard thresholds: minimal or none (0 to 4 points), mild (5 to 9 points), moderate (10 to 14 points), and severe (≥15 points). This scale has been proved to have high reliability and validity in various Chinese populations.

Trait Coping Style Questionnaire (TCSQ)

The TCSQ assesses positive coping and negative coping styles across 20 items. The questionnaire uses a 1 to 5point scale to reflect the stable coping styles related to personality traits of an individual.

Survey methods

Patients gained access to the psychological evaluation questionnaire by scanning a QR code within 4 hours of admission (before intervention) and before discharge (after intervention).

Interventions

Nursing staff in the isolation ward implemented psychological nursing interventions for patients admitted to the ward with suspected COVID-19 infection. Interventions included: (I) taking care to understand patients, and explaining to patients the importance and necessity of isolation screening, in order to improve their understanding and degree of cooperation; (II) patiently introducing the layout of the isolation ward, isolation rules, scope of activities, and matters requiring attention to patients; (III) providing patients with targeted treatment and life care; (IV) making patients aware of the importance of using protective equipment, reducing patients' fear, and establishing a good nurse-patient relationship through health education; (V) providing COVID-19-related health education materials to guide patients in gaining an accurate understanding of the disease and improve patients' ability to take care of themselves and their health; (VI) using a telephone, WeChat, or other forms of communication to establish contact with patients in order to help patients understand and address their psychological problems, and to promote a positive attitude and positive and effective actions. (VII) helping patients to clear up anxiety, depression, and other negative emotions; (VIII) using non-verbal communication skills to communicate between nurses and patients while keeping spatial distance, such as through the eyes, movements, and text communication (e.g., "thumbs up" to show encouragement, the "win" sign to show when a patient was getting better, or a pat on the shoulder with the back of the hand to express comfort when a patient is feeling sad; (IX) taking the initiative to help elderly or weak individuals, children, or other patients are unable to take care of themselves; (X) Helping isolated patients to establish social emotional support, implemented by responsible nurses with rich experience, strong communication and coordination skills, actively persuading family members to increase communication and contact with patients, giving patients psychological comfort, eliminating their worries, and guiding patients to take the initiative communicate with the outside world and improving the social support system for each patient; (XI) guiding patients to use emotional regulation auxiliary intervention methods, including attentional shifting, physical decompression, breathing relaxation, self-education, and communication regulation.

Statistical methods

SPSS22.0 statistical software (IBM Corporation, Armonk, NY, USA) was used to collate and analyze the data. Measurement data were expressed as mean ± standard deviation ($\bar{x}$±S). Comparisons between 2 groups were performed using t-tests. The correlation between 2 variables was analyzed by Pearson's linear correlation. Two-sided tests were used, and P<0.05 represented a statistically significant difference.

Results

The general data of patients with suspected COVID-19

A total of 137 patients, including 64 males and 73 females, were eventually included in the study. The patients ranged in age from 15–88 years old (43.3±15.8 years old) and were isolated for 1–11 days (2.7±1.1 days). Finally, 7 patients were diagnosed with COVID-19.

The details of age, gender, marital status, occupation, education level and days of hospitalization are shown in *Table 1*.

Comparison of GAD-7 score and PHQ-9 score before and after psychological nursing intervention

Of the 137 patients with suspected COVID-19 who were enrolled in this study, 73 (53.28%) patients had no obvious anxiety, 42 (30.66%) patients had mild anxiety, and 22 (16.06%) patients had moderate to severe anxiety, according to their GAD-7 scores. Before intervention, the GAD-7 scores of the patients with no obvious anxiety, mild anxiety, and mild to severe anxiety were 1.75±1.48, 7.26±1.18, and 13.86±2.70, respectively. After intervention, the GAD-7 scores of the 3 groups were 1.45±0.85, 4.31±1.15, and 8.36±3.26, respectively, and the difference from before intervention was statistically significant. Before intervention, the PHQ-9 showed that 71 (51.82%) patients had no obvious depression, 49 (35.77%) patients had mild depression, and 17 (12.41%) patients had moderate to severe depression. The PHQ-9 scores in the non-depressed, mild, and moderate to severe depression groups were 2.38 ±1.31, 6.86±1.24, and 13.82±3.52, respectively, compared with 1.38±0.82, 3.33±1.71, and 7.76±3.42, respectively, after intervention. The difference between the

Table 1 General data of patients with suspected COVID-19 (N=137)

Characteristic	N	%
Sex		
Male	64	46.7
Female	73	53.3
Age (years)		
<20	7	5.1
20–29	16	11.7
30–39	44	32.1
40–49	24	17.5
>50	46	33.6
Marital status		
Unmarried	22	16.1
Married	97	70.8
Divorce	12	8.8
Widowed	6	4.4
Occupational status		
Student	16	11.7
Employed	81	59.1
Retired	21	15.3
Unemployed	19	13.9
Education level		
Junior high school or below	30	21.9
College or below	42	30.7
Bachelor's degree	57	41.6
Master's degree or above	8	5.8
Days of hospitalization (including before transfer)		
1–3 days	117	85.4
4–6 days	18	13.1
7–10 days	2	1.5

COVID-19, coronavirus disease 2019.

2 groups was statistically significant (*Table 2*).

Comparison of TCSQ score before and after psychological nursing intervention

Before intervention, the patients had a TCSQ positive coping score (PC score) of 31.07±5.25 and a negative coping score (NC score) of 28.78±6.72. After intervention, the PC and NC scores were 36.40±5.93 and 24.60±5.99, respectively. The differences in the pre- and post-intervention scores were statistically significant (*Table 3*).

Correlation analysis of GAD-7 total score, PHQ-9 total score and TCSQ score before and after psychological intervention

Before and after intervention, the GAD-7 score and PHQ-9 score were negatively correlated with the PC score but positively correlated with the NC score (*Tables 4* and *5*).

Discussion

Recently, the World Health Organization (WHO) listed COVID-19 as an international health emergency (7). According to China's valuable experience in dealing with COVID-19, in the absence of an effective vaccine for mass immunization, the most basic method to control infectious diseases (cutting off the route of transmission) is the most effective strategy to control the spread of the epidemic. For example, the Chinese government advocates that masks must be worn in public places, shelter hospitals in areas with more confirmed cases, and isolation points for isolation and treatment of suspected patients all over the country are effective guarantees for the rapid control of the epidemic in China.

During the isolation period, patients with suspected COVID-19 are separated from their families, lose communication with the outside world, and have insufficient social support. These factors, together with a lack of awareness of the disease, as well as the atmosphere of the isolation ward and the effects of medical staff wearing strict protective clothing, can provoke negative psychological reactions in patients (8,9). At the same time, patients worry about themselves, their family members, and friends being infected, as well as the development and prognosis of the disease and the impact on their work; thus, they are prone to experiencing psychological issues such as anxiety, depression, and fear (10-13). Anxiety can manifest in patients as restlessness, irritability, and in severe cases, a rapid pulse, heavy breathing, insomnia, headache, and irritable. Depression can manifest as loss of interest, a depressed mood, crying, a sense of despair, sleep disturbance, loss of appetite, and decreased concentration (14). Excessive anxiety and panic are extremely detrimental to

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Table 2 Comparison of GAD-7 score and PHQ-9 score before and after psychological nursing intervention

Group	GAD-7			PHQ-9		
	No anxiety	Mild anxiety	Moderate and severe anxiety	No depression	Mild depression	Moderate and severe depression
Before intervention	1.75±1.48	7.26±1.18	13.86±2.70	2.38±1.31	6.86±1.24	13.82±3.52
After intervention	1.45±0.85	4.31±1.15	8.36±3.26	1.38±0.82	3.33±1.71	7.76±3.42
t	2.05	9.81	13.61	9.25	15.36	17.96
P	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01

GAD-7, Generalized Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9.

Table 3 Comparison of TCSQ score before and after psychological nursing intervention

Group	PC score	NC score
Before intervention	31.07±5.25	28.78±6.72
After intervention	36.40±5.93	24.60±5.99
t	7.85	5.65
P	<0.01	<0.01

TCSQ, Trait Coping Style Questionnaire; PC, positive coping; NC, negative coping.

Table 4 Correlation analysis of GAD-7 total score, PHQ-9 total score and TCSQ score before psychological intervention

Variable	PC score	NC score
GAD-7 total score		
r	−0.719	0.741
P	<0.01	<0.01
PHQ-9 total score		
r	−0.713	0.751
P	<0.01	<0.01

GAD-7, Generalized Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9; TCSQ, Trait Coping Style Questionnaire; PC, positive coping; NC, negative coping.negative coping.

Table 5 Correlation analysis of GAD-7 total score, PHQ-9 total score and TCSQ score after psychological intervention

Variable	PC score	NC score
GAD-7 total score		
r	−0.733	0.687
P	<0.01	<0.01
PHQ-9 total score		
r	−0.781	0.711
P	<0.01	<0.01

GAD-7, Generalized Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9; TCSQ, Trait Coping Style Questionnaire; PC, positive coping; NC, negative coping.

patients' treatment and rehabilitation, and reduce the body's immunity (15), which is not conducive to recovery from the disease. At the same time, the above negative emotions also affect the treatment effect, and patients may even develop a distrust of medical staff, increasing the risk of medical disputes.

The results of this study showed that during isolation, the rates of anxiety and depression among patients with suspected COVID-19 before intervention were 46.72% and 48.20%, respectively. However, after active intervention, the GAD-7 and PHQ-9 scores were significantly lower than before intervention (all P<0.05). Coping styles reflect individuals' stable coping behaviors and cognitive responses to various stress events. Positive coping styles can act as a buffer for the pressure caused by stress events. On the contrary, a negative coping style can aggravate the stress caused by a stress event. The results of this study showed that the positive coping score after intervention was significantly higher than that before intervention, while the negative coping score after intervention was significantly lower than that before intervention (all P<0.01). Before and after intervention, GAD-7 score and PHQ-9 score were negatively correlated with PC score, but were positively correlated with NC score. The GAD-7 score and PHQ-9 score reflect the degree of anxiety and depression of isolated patients: the higher the GAD-7 and PHQ-9 scores, the higher the patient's NC score is likely to be, patients are more likely to respond negatively. Our observations show that the timely and effective implementation of psychological intervention methods can

effectively relieve negative emotions in patients, change their negative emotions into positive ones, and relieve the pressure they feel, thus helping them to cope with the isolation period. In our study, a patient with normal GAD-7 score and PHQ-9 score increased both scores (rated as mild anxiety and depression) after psychological nursing intervention, which was considered to be related to longer isolation time (6 days), recurrent fever and repeated pharynx swabs, suggesting that even patients with normal scores before intervention may have large fluctuations in their psychological state during the isolation period. This further shows the necessity and importance of psychological nursing interventions.

A new systematic review of the effects of COVID-19 on the mental state of medical staff and the general population, including 62 studies and 162,639 participants from 17 countries, found that the combined prevalence rates of anxiety and depression were 33% and 28%, respectively. The prevalence rates of anxiety and depression were the highest among patients with previous diseases and COVID-19 infection (56% and 55%), and the situation of health care workers was similar to that of the general public. Common risk factors include women, nurses, low socioeconomic status, high risk of infection with COVID-19 and social isolation (16). The detection rates of anxiety and depression in this study were 46.72% and 48.20% respectively, similar to the conclusions of the above study. This study focuses on the influence of isolation state on the psychological status of suspected cases, and the improvement of patients' psychological status after taking corresponding psychological nursing intervention, which provides a new theoretical basis for evaluating the psychological status of isolated patients.

Compared with conventional nursing interventions, psychological nursing can reduce stress response and promote patient recovery (17). Through clinical practice, it can be concluded that positive psychological nursing interventions has the following advantages: (I) nurses understand and care about patients, achieve empathy, and establish a good nurse-patient relationship, which can relieve patients' anxious or depressive feelings (18), and improve their cooperation and compliance with treatment; (II) through positive education, patients' understanding of the disease can be improved, and the confidence they feel in overcoming the disease can be increased; (III) the use of professional and active communication methods, mobile phones, WeChat, and social media sites, along with reasonable use of non-verbal communication skills, can have a positive psychological impact on patients and drive positive emotions (19). Especially among adolescents, whose psychological and physiological development is not mature and is sensitive, psychological problems are widespread (20), and nursing interventions can alleviate adolescents' restless emotions. (IV) Effective psychological nursing can improve the patients' appetite and improve their resistance to disease.

To sum up, COVID-19 inflicts strong psychological stress on patients who are diagnosed or suspected to have the disease, which can result in psychological issues of varying degrees during isolation. An accurate evaluation of the psychological problems faced by patients during isolation and the implementation of positive intervention measures can help patients to face their disease. Interventions may include helping patients to adapt to the isolated environment as soon as possible, communicating to give positive guidance, showing concern for patients' psychological changes, and actively helping patients with social and emotional support. Such interventions can aid in obtaining the patient's trust and cooperation, and alleviating their negative feelings, thus helping them through the isolation period.

This study also has limitations and deficiencies, such as its sample small size. The cases included in this study are all patients around our hospital, and the number of study samples is greatly affected by the spread rate of the epidemic and government policy-making and other factors. If there is an opportunity to conduct further research, we will certainly try our best to enlarge the sample size and conduct a multicenter study to ensure the reliability of the research conclusions.

Footnote

the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Ethics Committee of Tianjin Third Central Hospital (No. bd2020111). A signed written informed consent agreement was provided by all patients before participation in the study.

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