

Application of Psychological Support Therapy in the Treatment of Patients with COVID-19 Complicated With Emotional Disorders: A Randomized Controlled Trial

Xiaohua Wu¹, Kai Liu^{1,†}, Weitong Zhang², Ruzheng Lin³, Guixiang Lin³, Zaisheng Wang³

ABSTRACT

Objective: To explore the application effect of psychological support therapy in patients with COPD complicated with emotional disorders.

Methods: 72 cases of patients with COVID-19 complicated with emotional disorders admitted to Hainan General Hospital from January 2020 to March 2020 were selected as the study objects by convenient sampling method. The control group received routine treatment and nursing intervention, while the observation group received psychological support therapy on the basis of treatment for the control group. The percentage of FEV1 in the predicted value (FEV1), the ratio of FEV1 to forced vital capacity (FEV1/FVC), score in Hamilton Anxiety Scale (HAMA) and score in Hamilton Depression Scale (HAMD), score in COPD Assessment Test (CAT) and score in Modified Medical Research Council (mMRC) Dyspnea Scale, satisfaction degree and happiness degree were compared between the two groups before and after the intervention.

Results: After the intervention, the differences of FEV1% and FEV1/FVC between the two groups were not statistically significant ($P>0.05$). The HAMA score and HAMD score in the observation group were lower than those in the control group, and the difference was statistically significant ($P<0.05$). The CAT score and mMRC score in the observation group were lower than those in the control group, with statistically significant difference ($P<0.05$). The nursing satisfaction degree and happiness degree of the observation group were higher than those of the control group, with statistically significant difference ($P<0.05$). **Conclusion:** Psychological support therapy can alleviate the adverse emotions of patients with COPD complicated with emotional disorders effectively, improve the symptoms of dyspnea, improve the quality of life and happiness degree of patients, and improve the patient's nursing satisfaction degree.

Key words: COVID-19, Emotional disorders, Quality of life, Dyspnea, Psychological support therapy.

Introduction

Due to the high infectivity of COVID-19, isolation treatment is required, and psychological changes such as depression or anxiety are easy to occur after long-term isolation treatment [1]. However, in clinical treatment, many doctors only pay attention to the changes of clinical

symptoms, signs and other examination results of patients, but often ignore whether patients are complicated with depression or anxiety. Studies have reported that 36.61% of hospitalized patients with COVID-19 are accompanied by anxiety [2] and 46.34% by depression [3]. Anxiety and depression will aggravate the condition of COVID-19 and affect the prognosis

Department of Geriatric Center, Hainan General Hospital, Hainan Affiliated Hospital of Hainan Medical University, P.R China
Department of General surgery, Hainan General Hospital, Hainan Affiliated Hospital of Hainan Medical University, P.R China
Department of General Practice, Hainan General Hospital, Hainan Affiliated Hospital of Hainan Medical University, P.R China
†Author for correspondences: Kai Liu, Department of Geriatric Center, Hainan General Hospital, Hainan Affiliated Hospital of Hainan Medical University, Haikou 570311, P.R China, E-mail: hmliukai@163.com

adversely [4]. Therefore, in clinical treatment, attention should not only be paid to changes in physical state, but also to psychological changes of patients. In this study, psychological support therapy including listening, explanation, guarantee, guidance and encouragement was carried out on the basis of routine treatment for patients with COVID-19 complicated with emotional disorders, and good results were achieved, which are reported as follows.

Materials and Methods

■ Participants

72 cases of patients with COVID-19 complicated with emotional disorders admitted to Hainan General Hospital from January 2020 to March 2020 were selected as the study subjects consecutively. Inclusion criteria: (1) Patients diagnosed as with COVID-19 definitely under isolation treatment in hospital; (2) Patients with emotional disorders such as anxiety and depression, the score of Hamilton Anxiety Scale (HAMA) the score of and Hamilton Depression Scale (HAMD) were higher than 7 points; (3) Patients with normal cognitive ability and without communication barrier; (4) Patients with a hospitalization period of more than 2 weeks, having been informed and having consented, and having signed the informed consent form voluntarily. Exclusion criteria: (1) Patients with a history of mental illness; (2) Patients with cognitive disorders and a score of Mini-Mental State Examination (MMSE) below 27 points; (3) Patients with severe systemic diseases; (4) Patients with malignant tumors. The patients included in the study were divided into the intervention group and the control group randomly according to random number table method, 36 cases in each group (Figure 1).

In the intervention group, there were 22 males and 14 females, with an average age of 54.16±10.28 years; at the time of admission, the Pneumonia severity index (PSI) was classified as grade I (0 cases), grade II (10 cases), grade III (12 cases), grade IV (10 cases) and grade V (4 cases); education level: 12 cases with an education level of high school and below, 24 cases with an education level of above high school. In the control group, there were 21 males and 15 females, with an average age of 53.78±9.97 years; at the time of admission, the Pneumonia severity

index (PSI) was classified as grade I (0 cases), grade II (11 cases), grade III (12 cases), grade IV (10 cases) and grade V (3 cases); education level: 13 cases with an education level of high school and below, 23 cases with an education level of above high school. In comparison of the general data of the two groups of patients, the difference was not statistically significant (P>0.05) and was comparable, as shown in Table 1. The average HAMA score of all subjects was 12.53±3.29; the average HAMD score was 12.32±3.39, (Figure 2). This study was approved by Ethics Committee of the Hospital (2020215).

■ Methods

Patients in the control group were treated actively according to “Treatment Plan for COVID-19” issued by National Health Commission of the People’s Republic of China, and were given routine nursing such as health education, diet guidance, and medication guidance. The intervention group was implemented with psychological support therapy on the basis of the treatment for the control group. The participants in this study included a psychiatrist and 4 nursing staff, all of whom had more than 5 years of clinical experience and received a training of systematic psychological nursing in this study. Medical staff could relieve patients’ negative emotions, enhance their confidence in fighting against diseases and promote physical recovery by listening, explanation, guarantee, guidance and encouragement, etc. The specific methods were as follows: (1) Listening. Patients were encouraged to express their emotions and confide to the nursing staff who listened patiently and found their psychological problems in the process. (2) Explanation. As patients did not

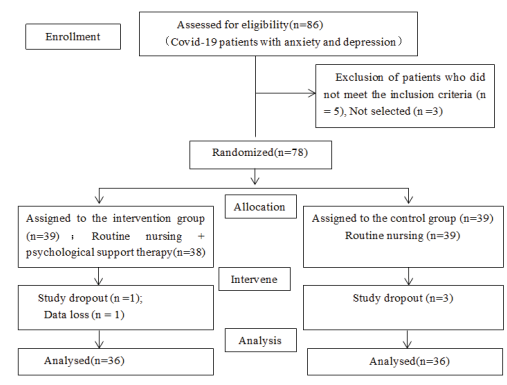


Figure 1: Study flow diagram.

Table 1: comparison of general data between two groups of patients with COVID-19.

Group	n	Gender, n (%)		Age (years)	Pneumonia severity index, n(%)		Education level, n (%)	
		Male	Female	$\bar{x} \pm s$	II, III	IV, V	High school and below	High school and above
Intervention	36	22	14	54.16±10.28	22	14	12	24
Control	36	21	15	53.78±9.97	23	13	13	23
t/ χ^2		0.06		1.24	0.05		0.25	
P		0.81		0.21	0.82		0.66	

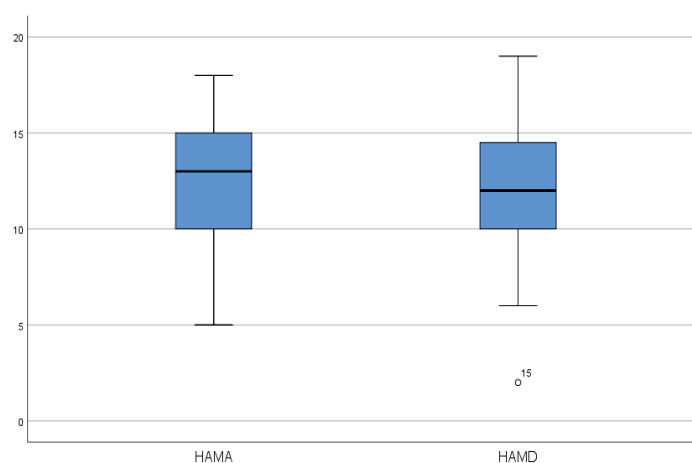


Figure 2: Anxiety and depression levels in total COVID-19 patients.

have a comprehensive understanding of disease-related knowledge and were prone to worry and fear, nursing staff should explain the causes of disease, prevention, treatment and other knowledge to patients in easy-to-understand languages, and emphasize the adverse effects of patients' depression, anxiety and other negative emotions on disease recovery to help patients identify their negative emotions. (3) Guarantee. Many patients were worried about the development, transfer and development of the disease. Nursing staff gave altruistic guarantee and examples to introduce the treatment effects of other patients, so that patients could trust doctors and the medical level of the hospital, improve the treatment confidence and reduce the generation of negative emotions. (4) Guidance and suggestions. Patients often felt that they had caused trouble to their families. Nursing staff instructed patients to learn to think from others' perspective and think about problems from the perspective of their families, and transform guilt into determination and motivation to resist diseases. At the same time, it was suggested that patients listen to relaxing music to promote physical and mental relaxation. (5) Encouragement. Patients were encouraged to write diaries,

watch TV or do things that interest them in their daily life to divert their attention. During family visits, patients' families were encouraged to communicate with patients more and give them help and care in their life so that patients could feel the warmth and support of their families. The period of psychological support therapy was about 40 - 50 min each time, twice a week for 2 weeks.

■ **Observation indexes**

(1) Pulmonary function test. The first-second forced expiratory volumes (FEV1), the percentages of FEV1 in the predicted value (FEV1), the ratios of FeV1 to forced vital capacity (FEV1/FVC) of the two groups of patients were measured by Lung function detector (JAEGER Mastor Screen, the United States). (2) Evaluation of anxiety and depression. The anxiety and depression states of the two groups of patients were evaluated by HAMA (reliability coefficient of 0.89-0.97, validity of 0.64-0.69) compiled by Hamilton in 1959 and HAMD (reliability coefficient of 0.87 - 0.99, validity of 0.63 - 0.70) [5] compiled in 1960. The score of 7-17 points represented mild anxiety and depression, the score of 18 - 24 points represented moderate anxiety and depression, and the score of more than 24 points represented severe anxiety

and depression. The collection times of the above indexes were 1 day before treatment and 1 day before discharge. (3) Evaluation of respiratory condition. Currently, there was no special scale for COVID-19, so the degree of dyspnea of patients was evaluated by COPD Assessment Test (CAT) compiled by Jones [6] in 2009 (reliability coefficient of 0.76-0.79, validity of 0.70-0.71) and the mMRC Dyspnea Scale Score (reliability coefficient of 0.84-0.99, validity of 0.76-0.83) in "Diagnosis and Treatment Guideline for COPD of the people's Republic of China" revised in 2007. The higher the score, the worse the patient's quality of life or the more severe degree of the dyspnea. CAT evaluated the quality of life of patients from sputum, sleep, chest distress, cough, emotion, energy, daily exercise and exercise endurance, with 0 - 5 points for each problem and a total score of 0-40 points. The mMRC score of 0 point represented mild dyspnea, 1 point represented moderate dyspnea, 2 points represented severe dyspnea, 3 points represented extremely severe dyspnea (stopping for rest was required when after walking for about 100 m), and 4 points represented extremely severe dyspnea (unable to go out, dyspnea when dressing or undressing). (4) Evaluation of satisfaction degree and happiness degree. In evaluation of satisfaction degree, the self-made questionnaire on satisfaction degree of our hospital was adopted, including 4 options of satisfaction, satisfaction on the whole, general satisfaction and dissatisfaction. Satisfaction Degree = (Satisfaction + Satisfaction on the Whole+General Satisfaction) /Total ×100%. Happiness degree was evaluated by General Well-being Schedule (GWB) (reliability coefficient of 0.77-0.89, validity of 0.73-0.82) [7] compiled by Fazio in 1977, including 6 dimensions of emotional and behavioral control, worry about health status, satisfaction and interest in life, energy, relaxation and tension, happiness or depression, with a total of 25 items. 1 item was scored on a scale of 1-7 points, 4 items were scored on a scale of 1-10 points, 4 items

were scored on a scale of 1-5 points, 5 items were scored on a scale of 1-3 points, 10 items were scored on a scale of 1-6 points, and 1 item including 8 questions all of which were scored on a scale of 1-2 points, with a total score of 32-158 points. Females with a score of 71 or more or males with a score of 75 or more represented happiness. The collection time of the above indicators was 1 day before discharge.

■ Statistical methods

Statistical analysis was conducted by SPSS26.0 software. The measurement data were described by Mean Standard ± Deviation ($\bar{x} \pm s$) and compared by t test. The statistical data were expressed by the number of cases and the percentage (%) and compared by χ^2 test. The difference was statistically significant when P Value was less than 0.05.

Results

1. Comparison of pulmonary function between the two groups before and after the intervention (Table 2). Before and after the intervention, the differences of FEV1% and FEV1/FVC of COPD patients in the two groups were not statistically significant (P > 0.05). After the intervention, FEV1% of COPD patients in the two groups was higher than that before the intervention, with statistically significant difference (P < 0.05).
2. Comparison of HAMA scores and HAMD scores between the two groups before and after the intervention (Table 3) and Figure 3. Before the intervention, the difference of HAMA score and HAMD score between the two groups was not statistically significant (P>0.05). After the intervention, the HAMA score and HAMD score in the observation group were lower than those in the control group, with statistically significant difference (P < 0.05).
3. Comparison of CAT score and mMRC score between the two groups after the

Table 2: Comparison of lung function between two groups of COVID-19 patients before and after intervention ($\bar{x} \pm s$).

Group	n	FEV1%		t	P	FEV1/FVC(%)		t	P
		PRE	POST			PRE	POST		
Intervention	36	45.14±7.96	49.31±7.42	2.94	0.01	57.31±6.93	57.84±6.71	0.45	0.69
Control	36	45.19±7.93	48.61±7.95	2.13	0.04	57.05±7.01	58.12±6.81	0.83	0.42
t		0.04	0.51			0.21	0.23		
P		0.89	0.66			0.87	0.84		

intervention: (Table 4). After the intervention, the CAT score and mMRC score in the observation group were lower than those in the control group, with statistically significant difference ($P < 0.05$).

4. Comparison of patients' satisfaction degree

and happiness degree between the two groups: (Table 5). After the intervention, the satisfaction degree and happiness degree of patients in the observation group were higher than those in the control group, with statistically significant difference ($P < 0.05$).

Table 3: Comparison of HAMA and HAMD scores ($\bar{x} \pm s$) between two groups of COVID-19 patients before and after intervention.

Group	n	HAMA		t	P	HAMD		t	P
		PRE	POST			PRE	POST		
Intervention	36	12.58±2.93	8.34±1.72	2.94	0.01	12.32±3.14	8.61±1.92	7.57	<0.01
Control	36	12.47±3.66	10.84±2.17	2.13	0.04	12.07±2.91	10.72±2.09	4.23	<0.01
t		0.34	1.74			0.45	2.91		
P		5.79	<0.01			0.65	<0.01		

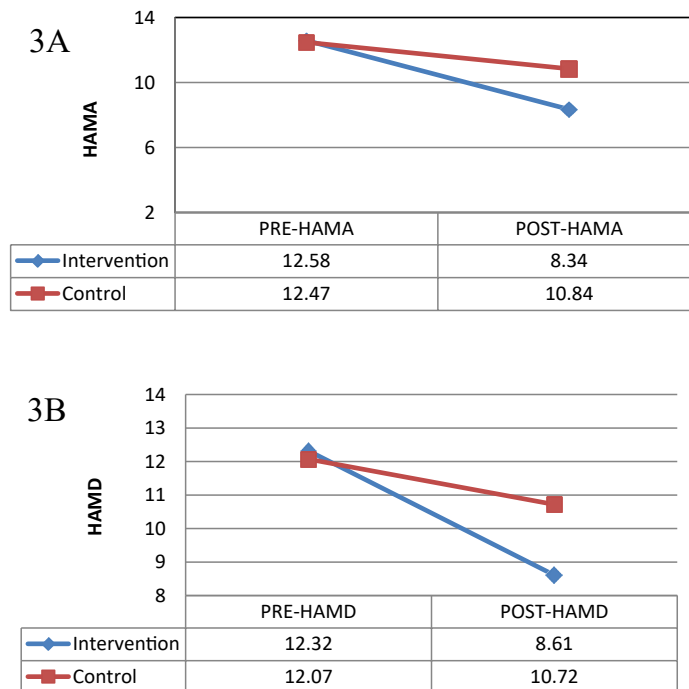


Figure 3: Comparison of HAMA (A) and HAMD (B) score changes between the intervention group and the control group after psychological support therapy.

Table 4: Comparison of CAT and mMRC scores of two groups of COVID-19 patients after intervention ($\bar{x} \pm s$).

	n	CAT	mMRC
Intervention	36	18.74±5.09	1.39±0.46
Control	36	20.83±2.26	1.65±0.51
t		2.09	2.83
P		0.04	0.01

Table 5: Comparison of satisfaction degree and happiness degree after intervention between two groups of COVID-19 patients (%).

	n	Satisfaction degree	Happiness degree
Intervention	36	94.4	75.0
Control	36	80.6	47.2
χ^2		2.09	2.83
P		0.04	0.01

Discussion

COVID-19 is mainly manifested as pulmonary lesions, and also causes complications such as metabolic disorders, circulatory disorders and nervous system disease [8]. It is highly infectious and there is no specific drug at present. In addition, long-term isolation treatment and disease perplexity are easily to cause patients' depression, anxiety and other adverse emotions. Studies have reported that the occurrence of COVID-19 emotional disorders may be related to factors such as disease severity, high infectivity, insufficient health guidance and education, lack of family care and social support [9]. Psychological changes and physiological function changes affect each other in the process of disease occurrence. Depression and anxiety are not conducive to the rehabilitation treatment of COVID-19. Therefore, attention should be paid to the psychological changes of patients with COVID-19 under treatment of physical diseases.

Psychological support therapy is a method based on psychodynamics, which treats patients with emotional disorders by listening, suggestion, guidance, encouragement and other methods, aiming to guide patients to learn to deal with diseases, avoid more negative emotions, improve patients' self-esteem and self-confidence, and adapt to the current living conditions faster [10]. In this study, the medical staff and patients mostly talked in interactive dialogue. During the conversation, the medical staff listened carefully to the patients' inner thoughts and responded to the patients in time to provide some constructive suggestions and guidance to the patients, understood and supported the distress and psychological burden faced by the patients, and at the same time carried out psychological counseling to reduce the adverse emotions of the patients. The care from family members makes the patients feel the warmth of the family, obtain spiritual support, reduce the breeding of adverse emotions, and improve their happiness.

In this study, psychological support therapy was applied to patients with COVID-19 complicated with emotional disorders. The results showed that FEV1% of patients in the two groups was higher than that before the intervention, but FEV1/FVC did not improve significantly. The reason was that after standardized treatment, bronchospasm of patients was relieved and

FEV1% was recovered to some extent. After treatment, the difference in lung function index between the two groups was not statistically significant, indicating that psychological intervention had no obvious effect on improvement of lung function. Depression and anxiety were the two main manifestations of emotional disorders. The results of this study showed that the HAMA score and HAMD score in the observation group were lower than those in the control group after the intervention, indicating that psychological support therapy had obvious effect on improving patients' depression and anxiety and other negative emotions, which was consistent with the report of Canevska [11]. Long-term isolation treatment and infectivity of the disease will affect the life and work of COVID-19 patients after discharge. CAT questionnaire is a common scale for evaluating the quality of life of COPD patients. The results of this study showed that after the intervention, the CAT score of the observation group was lower than that of the control group, indicating that psychological support therapy could promote the improvement of the quality of life of COVID-19 patients, which was related to the reduction of patients' negative emotions. Dyspnea is one of the common clinical symptoms of COVID-19 [12]. Studies showed that dyspnea was closely related to depression and anxiety. The higher the mMRC score, the more serious the anxiety level [13]. Dyspnea can enhance patients' fear, anxiety and emotional reaction pressure, and negative emotions can adjust the respiratory sensory threshold, worsening the patients' dyspnea [14]. In this study, after the intervention, the mMRC score of the observation group was lower than that of the control group, indicating that psychological support therapy could reduce the degree of dyspnea of patients by improving their negative emotions, thus forming a virtuous circle, and at the same time, patients' satisfaction degree and happiness degree were also improved.

Conclusion

COVID-19 is prone to emotional disorders, and is a common disease of both body and mind. Timely and accurate evaluation of patients' psychological state and implementation of psychological support therapy can improve patients' adverse emotions, reduce the

degree of dyspnea and improve the quality of patients' life effectively.

Credit Authorship Contribution Statement

Xiaohua Wu and Kai Liu carry out the conception and design of the article, the analysis and interpretation of the results; Xiaohua Wu carries out the writing of the paper; Weitong Zhang and Wu Xiaohua carry out the data sorting;

Ruzheng Lin, Guixiang Lin, Zaisheng Wang and Kai Liu carried out the implementation and feasibility analysis of data collection research, paper revision, article quality control and review; Xiaohua Wu and Kai Liu are responsible for the overall supervision and management of the article.

Declaration of Competing Interest

None.

References

1. Kang D, Choi H, Kim JH. Spatial epidemic dynamics of the COVID-19 outbreak in China. *Int. J. Infect. Dis* 94(1), 96-102 (2020).
2. Wenjun C, Ziwei F, Hou G, et al. The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res* 287 (2020).
3. Kim SW, Su KP. Using psychoneuroimmunity against COVID-19. *Brain. Behav. Immun* 87(1), 4-5 (2020).
4. Torales J, O'Higgins M, Castaldelli-Maia JM, et al. The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int. J. Soc. Psychiatry* 66(4), 317-320 (2020).
5. Gale C, Glue P, Guaiana G, et al. Influence of covariates on heterogeneity in Hamilton Anxiety Scale ratings in placebo-controlled trials of benzodiazepines in generalized anxiety disorder: Systematic review and meta-analysis. *J. Psychopharmacol* 33(5), 543-547 (2019).
6. Jones PW. The COPD Assessment Test: what have we learned over its first 5 years? *Eur. Respir. J.* 44(4), 833-834 (2014).
7. Yu J, Song Y, Dong H, et al. Factors associated with the general well-being of nurses in a tertiary Chinese hospital: A cross-sectional study. *J. Nurs. Manag* (2020).
8. Gewin V. Safely conducting essential research in the face of COVID-19. *Nature* (2020).
9. Yao H, Chen JH, Xu YF. Rethinking online mental health services in China during the COVID-19 epidemic. *Asian. J. Psychiatr* 50(1), 10 (2015).
10. Santambrogio J, Colmegna F, Di Brita C, et al. Psychiatric and psychological support for an adolescent woman with chromosome 22 deletion syndrome and intellectual disability: a good outcome. *Riv. Psychiatr.* Mar-55(2), 106-111 (2020).
11. Canevska E, Stoimenova-Canevska E, Pop-Jordanova N. Pril (Makedon Akad Nauk Umet Odd Med Nauki) 40(3), 77-89 (2019).
12. Zhai P, Ding Y, Wu X, et al. The epidemiology, diagnosis and treatment of COVID-19. *Int. J. Antimicrob Agents* (2020).
13. Uchmanowicz I, Jankowska-Polanska B, Motowidlo U, et al. Assessment of illness acceptance by patients with COPD and the prevalence of depression and anxiety in COPD. *Int. J. Chron. Obstruct. Pulmon. Dis* 9;11:963-70 (2016).
14. Dransfield MT, Garner JL, Bhatt SP, et al. *Ann. Am. Thorac. Soc.* (2020).