

# Hope Levels and Resilience in Patients with Severe Novel Coronavirus Pneumonia: The Current Situation and a Correlation Analysis

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**Objective:** The study aims to analyze the correlation between hope levels and resilience in patients with severe novel coronavirus pneumonia (COVID-19).

**Methods:** Fifty-six patients with severe COVID-19 were investigated, with the use of a general information questionnaire, the Herth Hope Index, and the Connor–Davidson resilience scale.

**Results:** There was a significant difference in patients' hope levels with respect to marital status and educational background ( $P < 0.05$ ), and there was a significant difference in resilience scores depending on gender and family economic situation ( $P < 0.05$ ). In the present study, the hope levels and resilience in the patients were moderate, with an average score of  $(34.93 \pm 5.45)$  and  $(69.36 \pm 15.52)$ , respectively. There was a significant positive correlation between the hope level and the resilience score in these patients ( $P < 0.05$ ).

**Conclusion:** In patients with severe COVID-19, the higher the hope level, the higher the resilience score.

**Keywords:** COVID-19, severe novel coronavirus pneumonia, hope level, resilience

## Introduction

Novel coronavirus pneumonia (COVID-19) is a new infectious disease that can be transmitted by humans. It is highly infectious, with high incidence and a wide social impact, and it has led to a high degree of social panic. As there is no effective treatment targeting the etiology,<sup>1</sup> patients are still uncertain about whether they can really recover from it, whether they will experience sequelae, and whether they will suffer a reoccurrence or infect others. Therefore, mental health problems are common in patients with COVID-19 and need to be solved. Hope is a positive internal support force that can help individuals to face and solve difficulties with a positive attitude. It can alleviate the negative emotions felt under acute stress and enable patients to regain social functions, which is of great importance.<sup>2</sup> Resilience is one of the core features of positive psychology. It can help humans to cope with bad moods, negative psychological states, and major life pressures, and it can increase an individual's comfort and happiness.<sup>3</sup> It has been confirmed that there is a correlation between hope levels and resilience, and hope levels can predict resilience in patients.<sup>4</sup> However, it has not yet been reported whether the hope level in a patient with COVID-19 is correlated with resilience or whether there exists an interaction between the two factors. The aims of the present study are to investigate

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what is currently known about the correlation between hope levels and resilience and to look into the correlation between these two factors in more detail so as to provide a reference for mental health intervention in patients with COVID-19.

## Subjects and Methods

### Study Subjects

The convenience sampling method was used to select 56 critically ill COVID-19 patients, who were treated in a designated hospital in Wuhan between February 20, 2020 and March 15, 2020, as the research subjects. The inclusion criteria were as follows: (1) patients diagnosed with severe COVID-19 according to the diagnostic criteria of the COVID-19 prevention and control plan issued by the National Health Committee;<sup>5</sup> (2) patients with clear awareness and certain communication and understanding abilities; and (3) patients who provided informed consent. The exclusion criteria were as follows: (1) patients with mental and psychological disorders and (2) patients who could not complete the questionnaire because of their critical condition. Two survey methods were used, a mobile phone questionnaire or an on-the-spot questionnaire, and they were uniformly filled in within 24–48 hours of admission. All the patients in the present study voluntarily participated in the investigation and signed informed consent before the investigation. Unified guidance was used to explain the method of filling out the questionnaire. For those unable to do so by themselves, the investigator read it out to them and filled it out on their behalf. When reviewing the questionnaire, the investigator checked carefully that the questionnaire was complete. If there were any missing items, the patient was asked to fill it in. The completed questionnaires were collected in within a set time frame. A total of 56 questionnaires were sent out, and 56 valid questionnaires were returned. There were no invalid questionnaires, so the effective recovery rate was 100%.

### Investigation Tools

#### General Information Questionnaire

The questionnaire was designed by the research group after reviewing the literature and consulting experts, and it was used to record demographic and disease-related information about the patients, including age, educational background, marital status, occupation, family residence,

family economic situation, and infection among family members.

#### Herth Hope Index

The Herth Hope Index (HHI)<sup>6</sup> was compiled by the American researcher Herth in 1991 and introduced into China in 1999 by Zhao Haiping and Wang Jian of China Medical University. The scale consists of three dimensions as follows: a positive attitude toward reality and the future, taking positive actions, and maintaining a close relationship with others. There are 12 items in total, each of which is worth 1–4 points, with a total score of 12–48 points. The Likert's 4-level scoring method was used to score each item in the HHI. The options were strongly opposed, opposed, agreed, and strongly agreed, and 1, 2, 3, and 4 points were scored, respectively. The higher the score, the higher the hope level in the patient. The patients were divided into three grades according to their scores. Patients who scored 12–23 points were in the low grade, patients who scored 24–35 points were in the middle grade, and patients who scored 36–48 were in the high grade. The Cronbach  $\alpha$  coefficient of the internal consistency reliability of the scale was 0.850.<sup>7</sup>

#### The Chinese Version of the Connor–Davidson Resilience Scale

The Chinese version of the Concord-Davidson Resilience Scale<sup>8</sup> was compiled in 2007 by Zhang Jianxin and Yu Xiaonan, who based it on the original CD–RISC,<sup>9</sup> taking into account Chinese cultural background. It is now one of the most widely used scales in China. The scale has been changed from the original five dimensions to the three dimensions of tenacity, self-improvement, and optimism, with a total of 25 items. Using the 5-grade scoring method, the scores from “completely inconsistent” to “completely consistent” carry 1–5 points, and the higher the score, the higher the level of resilience. The internal consistency coefficient of the scale is 0.91, which means good criterion validity.

#### Statistical Analysis

SPSS20.0 software was used for the statistical analysis. Data conforming to normal distribution were described by means and standard deviations, independent sample t-tests, and one-way ANOVA. Data that did not conform to the normal distribution were analyzed by the Mann–Whitney U nonparametric rank-sum test and the Kruskal–Wallis test, and the correlation was analyzed by Pearson

correlation analysis. The level of statistical difference was set at 0.05.

## Results

### Current Status of Hope Levels and Resilience in Patients with Different General Characteristics

According to the results of the normal distribution test, the questionnaire data did not conform to the normal distribution, so a nonparametric test was used to analyze the hope level and resilience in patients with different demographic characteristics. The Z value and H value were the statistics obtained by the Mann–Whitney U nonparametric rank-sum test and the Kruskal–Wallis test, respectively. The hope level scores of patients of a different age, gender, occupation, family economic situation, and family residence, and with or without family infection were similar ( $P > 0.05$ ). There was a statistical significance in the hope level scores of patients with a different marital status and educational background ( $P < 0.05$ ). The resilience scores in patients of a different age, marital status, occupation, educational background, and family residence, along with or without family infection, were similar ( $P > 0.05$ ). There was a significant difference in the resilience scores of patients of a different gender and family economic situation ( $P < 0.05$ ). The results are shown in Table 1.

### Current Status of Hope Levels in Patients

In the present study, the 56 patients with severe COVID-19 had an average hope level score of ( $34.93 \pm 5.45$ ), ranging from 12 to 48, which belonged to the medium grade. Of the different dimensions, the score for positive attitude to reality and the future was ( $11.32 \pm 1.83$ ), the score for taking positive action was ( $12.45 \pm 2.05$ ), and the score for maintaining a close relationship with others was the lowest at ( $11.16 \pm 2.16$ ).

### Current Status of Resilience in Patients

In the present study, 56 patients with severe COVID-19 had an average resilience score of ( $69.36 \pm 15.52$ ), with scores ranging from 37 to 100, which belonged to the medium grade. Of the different dimensions, the score for tenacity was the highest, at ( $35.66 \pm 8.93$ ), the score for strength was ( $23.45 \pm 5.32$ ), and the score for optimism was the lowest at ( $10.25 \pm 2.81$ ).

### Correlation Between the Hope Level and Resilience in Patients

There was a significant positive correlation between the hope level and the resilience score ( $P < 0.05$ ). The correlations between the scores of each dimension of hope levels and resilience are given in Table 2.

## Discussion

### Differences in Hope Levels and Resilience Scores in Patients with Different General Characteristics

The results of the present study showed that the hope level in patients with a different marital status and educational background was different, and resilience in patients with a different gender and family economic situation was different. The hope level in married patients was higher than that in divorced or widowed patients, which is consistent with the research results of Qianqian et al<sup>10</sup>. This might be because divorced or widowed patients could not face the disease with a positive attitude without the care and emotional sustenance of a spouse. The higher the educational background, the higher the hope level, which was consistent with a study done by Hou XM.<sup>11</sup> Patients with a high educational background were better able to obtain information concerning the onset and progress of the disease, along with the therapeutic conditions, so they were more likely to have hope as the disease progressed. A high educational background could also help patients shift their attention. The resilience scores in male patients were higher than in female patients, which was consistent with the results of domestic research.<sup>12</sup> Compared with male patients, female patients were more prone to adopt avoidance strategies when facing negative events, while male patients were more inclined to choose positive coping strategies to solve the problems. The resilience scores in patients with a better family economic status were higher than those in patients with family economic difficulties, which was consistent with the relevant research results concerning burn patients.<sup>13</sup> Although the nation proclaimed a free-of-charge policy to reduce the financial burden on patients, for low-income patients, isolation treatment resulted in their being unable to work, which impacted their financial situation. Sufficient financial support can be an important external guarantee for patients in coping with disease, as it can reduce anxiety caused by economic problems and

**Table 1** Scores of Hope Level and Resilience in Patients with Severe COVID-19 According to Different Characteristics (n=56)

Item	n	Hope Level			Resilience		
		Z <sub>1</sub>	H <sub>1</sub>	P <sub>1</sub>	Z <sub>2</sub>	H <sub>2</sub>	P <sub>2</sub>
Age		0.387	-	0.592	2.316	-	0.128
<65	29						
≥65	27						
Gender		0.650	-	0.420	3.373	-	0.040
Male	31						
Female	25						
Infection of family members		0.000	-	1.000	0.983	-	0.322
Y	38						
N	18						
Marriage		5.199	-	0.045	2.888	-	0.089
Married	49						
Divorced or widowed	7						
Education level		-	7.471	0.031	-	3.164	0.367
Primary school and below	3						
Junior high school	24						
High school or junior college	15						
College and above	14						
Career		-	3.826	0.430	-	6.000	0.199
Peasants	2						
Worker	17						
Self-employment	17						
Business unit	6						
Other	14						
Family residence		4.017	-	0.134	1.336	-	0.513
Rural	16						
Cities	40						
Economic situation of families		-	4.083	0.130	-	9.845	0.007
Superior	7						
Moderate	38						
Hard	22						

**Notes:** Z<sub>1</sub>, H<sub>1</sub>, P<sub>1</sub> values are obtained by comparing the hope level of different groups of patients, and Z<sub>2</sub>, H<sub>2</sub>, P<sub>2</sub> values are obtained by comparing the mental toughness of different groups of patients.

provide patients with the confidence to fight a disease. a negative impact on physical and mental health. The above results suggested that hope was a symbol of Despair would be a risk factor for physical and mental a healthy psychological state, while despair had health.<sup>14</sup> Therefore, we should strengthen health

**Table 2** The Correlation Between the Hope Level and the Scores of Each Dimension and Resilience and the Scores of Each Dimension

	Psychological Toughness	Tenacity	Strength	Optimism
Hope level	0.329*	0.303*	0.301*	0.287
Positive attitude toward reality and the future	0.164	0.184	0.179	0.019
Taking positive actions	0.485*	0.453*	0.441*	0.402*
Maintaining a close relationship with others	0.187	0.137	0.148	0.315*

**Note:** \*Indicates p<0.05.

education for the less-educated and low-income patients, so these patients can have a more comprehensive understanding of COVID-19, which should reduce confusion and improve hope levels. Females and the divorced or widowed should be encouraged to communicate with family members and friends through WeChat and other platforms during isolation, so they feel understood, supported, and respected. This can help them to experience positive emotions, which will improve their hope levels and resilience.

## Analysis of the Current Situation of Hope Levels and Resilience in Patients with Severe COVID-19

In the present study, the hope level scores in patients with severe COVID-19 were ( $33.82 \pm 5.76$ ), which were in the medium and high range. The total scores of resilience in patients were ( $69.36 \pm 15.52$ ), which were also in the medium and high range. These results can be related to the current national attention and care being given to patients with COVID-19. After the outbreak of the pandemic, there were many medical teams assisting Hubei and working throughout the province. The government introduced a policy of free treatment for patients with COVID-19 and also provided a guarantee of food and accommodation for Wuhan residents, arranging isolation sites for those discharged from the hospital. All these actions made patients feel they were receiving practical support from society, and this enhanced their sense of hope. However, the hope level in COVID-19 patients was still lower than that currently reported in patients with cancer<sup>15-17</sup> and did not reach a high grade. The total resilience score was higher than in patients with cancer<sup>18</sup> and chronic disease,<sup>19</sup> but it still did not reach a high grade. These findings might be correlated first with the fact that the patients included in the present study were all severe cases. Second, since COVID-19 is a new infectious disease, there is no specific drug treatment at present, and the long-term treatment effect is not clear, meaning patients may lack confidence in the prospect of treatment. Moreover, the patients entered a special medical isolation environment after admission, separated from their relatives, and this could easily have led to their feeling nervous or anxious.

## Correlation Between Hope Levels and Resilience in Patients

The results of the present study showed that the hope level was positively correlated with the total resilience score.

The higher the hope level, the higher the resilience score. These results were consistent with those of Solano et al<sup>20</sup> who conducted a cross-sectional survey in patients with metastatic colorectal cancer and breast cancer. The results showed that there was a positive correlation between hope level and resilience. Herth<sup>6</sup> put forward the hope theory, in which hope was regarded as the internal driving force for patients to overcome disease. Patients with high hope levels and a positive and optimistic attitude were more motivated to overcome difficulties and find ways to relieve stress. Resilience is a process of dynamic development and change. When individuals are in a dangerous and dynamic external environment, they can still have the ability to adapt to the environment.<sup>21</sup> Hope can be regarded as a psychological protection factor. When facing a sudden epidemic, patients with high hope levels always keep a positive and optimistic attitude and believe that they have the ability to solve difficulties and work through adverse situations, and they have confidence in the future. These positive attitudes help them to take measures to deal with various problems and adapt to their current environment, which can lead to high resilience benefits.

In the present study, the dimension of positive action in the hope level is positively correlated with the tenacity, strength, and optimism in resilience. Thus, it can be seen that, in the face of the disease, when patients with COVID-19 regard the pressure as a challenge and take positive action to fight the disease, their resilience can effectively improve. For example, during the period of isolation treatment, if the patients actively seek help from the medical staff and family members, they will receive more love and care, which will help them to reduce COVID-19 injury to their self-esteem and emotions, reduce the sense of self-discrimination, and rebuild their trust. In addition, during the treatment and rehabilitation period, patients can join the volunteer team and actively help nurses to undertake some life care within their capabilities. From this, they can gain a sense of achievement and improve their functional status. Medical staff should take improving hope levels as a starting point, implement targeted cognitive psychological interventions for the patients, encourage the patients to face up to the disease, help them find confidence in overcoming it, and improve resilience. In addition, patients who have recovered from COVID-19 should be invited to publicize the curative effects, actively cooperate with the medical staff, improve the curative effect, and thus help other patients to face the future.

This study was about the correlation between the level of hope and mental resilience of patients with severe COVID-19 in hospital. The population surveyed was from the hard-hit area of COVID-19 in China and was representative to a certain extent, so it can reflect the correlation between the level of hope and mental resilience of COVID-19 patients. However, the survey scope was small and limited to a single hospital, and there was no further investigation into whether the patients had basic diseases and whether this would affect the level of hope and, in turn, the level of mental toughness. Therefore, the research results were limited to a certain extent.

## Conclusion

In conclusion, for patients with severe COVID-19, hope levels had a significant impact on resilience levels, suggesting that clinical medical staff should pay attention to the improvement of hope levels and enhance resilience to promote better adaptation to the disease. However, the types of intervention measures that can effectively improve the hope level and resilience in patients with pandemic diseases still need to be studied.

## Ethics Approval and Consent to Participate

We confirm that we have read the Editorial Policy pages. This study was conducted with approval from the Ethics Committee of Fujian Medical University Union Hospital. This study was conducted in accordance with the declaration of Helsinki. Written informed consent was obtained from all participants.

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## Disclosure

The authors report no conflicts of interest in this work.

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