



# The Correlation and Influencing Factors of Crisis Response Ability and Psychological Factors in Patients with Liver Cirrhosis

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## Abstract

**Background:** Illness can provoke a crisis response that affects condition acceptance, treatment and recovery. Patients' sense of coherence can influence this explored across patient cohorts internationally. However, few studies examine these effects in patients with hepatic cirrhosis. This study investigated sense of coherence and social support of patients with hepatic cirrhosis.

**Methods:** The psychological status of 146 patients admitted to the Digestive System Department, First Affiliated Hospital of Harbin Medical University, Harbin, China from Mar 2016 to Mar 2019 with hepatic cirrhosis was assessed using the Sense of Coherence (SOC-13), Social Support Rating Scale (SSRS) and crisis assessment scales.

**Results:** There was a low level of crisis response in patients with hepatic cirrhosis that was influenced by age, disease course, education level and Child-Pugh grade and negatively correlated with sense of coherence and social support.

**Conclusion:** Liver cirrhosis patients had a low level of crisis response. As the level of crisis response in is correlated with patients' sense of coherence, social support and educational level, careful assessment, tailored educational interventions and mobilizing of family support are important to maximize responses to illness and thus improve quality of life.

**Keywords:** Cirrhosis; Sense of coherence; Social support; Crisis response

## Introduction

Hepatic cirrhosis is a common disease and one of the major causes of death in China. Patients with hepatic cirrhosis in China account for a large proportion of the total number of hospital admissions in Internal Medicine Department, and most of them are from 21 to 50 yr old (1). Hepatic cirrhosis has the characteristics of long disease course, prolonged and no specific treatment, so patients suffer from the pain caused by it, complicated with hematemesis, ascites and black stool

and other complications, which then lead to a great psychological stress response (1).

Crisis response refers to a series of emotional, cognitive and behavioral reactions of individuals who are unable to apply general methods to solve current events. Patients with hepatic cirrhosis generally had different levels of poor crisis response, compared with other patients, and suffered multiple other conditions, which affects their coping with their illness (2). The level of



psychological crisis that these patients experience is often an important factor in their disease trajectory and recovery as it affects the physical and mental state of patients (3). The crisis response capacity of patients with hepatic cirrhosis has a certain impact on their clinical nursing, that is, the worse the crisis response capacity is, the more difficult the clinical nursing is, as these patients can be challenging to deal with and the crisis creates additionally dependencies and needs and therefore more resources are required. The crisis response also affects concordance with treatment, which is not conducive to the recovery.

Individual health was the result of combination of internal and external environmental pressures (such as life events, diseases, deaths, etc.) and the resources available for coping with these stressors (social, material, psychological and other resources) and sense of coherence (4). The sense of coherence mainly refers to the normal utilization ability of the patient related to their internal and external resources in the face of various stressors in life, which shows a kind of universal and persistent and dynamic confidence that the individual has in coping with pressure. Hepatic cirrhosis, given its multiple and far reaching symptomology, is a stressor for individuals concerned, thus making full use of the available resources and improving sense of coherence can aid recovery and coping with illness. Good social support and positive crisis response ability are good strategies to improve patients' psychological state (5).

However, there is little research that assesses coping or sense of coherence among this patient cohort. There has been research on the correlation between crisis response, sense of coherence and social support in patients with breast cancer, colorectal cancer, schizophrenia, peritoneal dialysis and other diseases, but no research has been reported in China, where cultural understandings of coping and coherence among this population would be very valuable for nursing practice (6).

For this reason, this study explored the sense of coherence and social support of patients with hepatic cirrhosis, and analyzed the current situation and influencing factors of their crisis response capacity, in order to inform the formula-

tion of clinical nursing program to improve the life quality of these patients.

## Materials and Methods

### *Aim*

The aim of this study was to explore the sense of coherence and social support of patients with hepatic cirrhosis, and analyze the current situation and influencing factors of their crisis response capacity.

### *Sample*

A total of 146 patients with hepatic cirrhosis admitted to the Digestive System Department, First Affiliated Hospital of Harbin Medical University, Harbin, China from Mar 2016 to Mar 2019 took a part in the study. This number was deemed sufficient to achieve statistical significance because according to the *Modern Medical Statistics*, the sample size should be 5-10 times of the independent variable, and the sample size formula was as follows: sample size (n) = the number of research factors (n) × (5~10) times. There were 24 research factors included in this study, so therefore sample size ought to be more than 120 cases. In addition, considering 15% inefficiency, an adequate sample size should be at least 130 cases.

The inclusion criteria were as follows: 1) patients who met the criteria for clinical diagnosis of hepatic cirrhosis in Chronic hepatitis B Prevention Guide formulated by the hepatology society of the Chinese medical association; 2) patients who were informed and agreed to participate in this study, and able to complete the questionnaire independently; 3) patients without other serious acute or chronic diseases; 4) patients without major life events in the past three months. Exclusion criteria were as follows: 1) patients with severe mental illness, visual impairment or understanding disorders; 2) patients with severe physical diseases such as heart, liver or kidney disease.

### *Ethical Approval*

The study has been approved by the Ethics Committee of our hospital, and the study objects

were given a detailed description of the study purpose and process before the study, allowed to withdraw from the study at any time, and all the objects signed informed consent forms.

### Research Instruments

1) General data collection: The general data of all patients were recorded and counted by the general data questionnaire made by our hospital, which mainly included gender, age, disease course, education level, occupation, health insurance type, Child-Pugh grade, etc.

2) The crisis assessment scale compiled, was used to assess the response of all patients with cirrhosis when they confronted with crisis events of disease (7). The scale mainly includes three subscales of emotional responses, cognitive and behavior severity, and each subscale score is 0 to 10 points according to the degree of damage. The higher the score is, the worse the crisis response is. Cronbach's  $\alpha$  coefficient of the scale is 0.89.

3) The psychological consensus scale (SOC-13) compiled, was used to evaluate the patients' psychological congruence, mainly including three dimensions: comprehensible, controllable, and sense of meaning, containing 13 items (8). Likert 7-level scoring method was used in each item. The total scores are recorded as sense of coherence scores, and the higher the score, the higher the level of sense of coherence. The Cronbach's  $\alpha$  coefficient is 0.76, the internal consistency co-

efficient is 0.80, the test-retest reliability is 0.61, with available the reliability and validity.

4) The social support rating scale (SSRS) compiled, was used to evaluate the social support level of patients, which included three dimensions of objective support, subjective support and utilization of support, with a total of 10 items(9). The higher the score indicates the better the social support level. Cronbach's  $\alpha$  coefficient of the scale is 0.92, and the consistency of each item is 0.89-0.94, which has good reliability and validity.

### Statistical analysis

SPSS18.0 (Chicago, IL, USA) statistical software was used for data processing. The total scores of SOC-13, SSRS and SCSQ and the scores of each dimension were expressed as mean  $\pm$  standard deviation. Pearson correlation analysis and structural equation model analysis were used for statistical inference, and the inspection level was  $\alpha=0.05$ .

## Results

### Score of crisis response during treatment of 146 patients with hepatic cirrhosis

The total score of crisis response of patients with cirrhosis was (15.69 $\pm$ 5.22), and the scores of its sub-items from high to low were cognition, psychological response and behavior. This suggested a low level of crisis response in patients with hepatic cirrhosis (Table 1).

**Table 1:** Score of crisis response and psychological status during treatment of 146 patients with hepatic cirrhosis

Item	Score ( $\bar{x} \pm s$ )
Total score of crisis response level	15.69 $\pm$ 5.22
Mental response	5.17 $\pm$ 2.19
Cognition	5.18 $\pm$ 2.80
Behavior	5.34 $\pm$ 2.08
Comprehensible	16.59 $\pm$ 7.30
Controllable	15.42 $\pm$ 6.18
Sense of meaning	22.64 $\pm$ 6.73
Total score of psychological consensus	20.48 $\pm$ 4.25
Objective support	15.04 $\pm$ 5.47
Subjective support	21.79 $\pm$ 5.80
Utilization of support	19.36 $\pm$ 4.72
Total score of social support	21.62 $\pm$ 6.34

**Correlation between crisis response level and general data in 146 patients with hepatic cirrhosis**

The level of crisis response in patients with hepatic cirrhosis was correlated with age, disease course, education level and Child-Pugh grade

( $P < 0.05$ ), but not correlated with gender and type of medical insurance ( $P > 0.05$ ) (Table 2). Among the influencing factors, age, course of disease and educational level have a negative effect, and Child-Pugh classification has a positive effect (Table 3).

**Table 2:** Correlation between crisis response level and general data in 146 patients with cirrhosis

General data		Number of cases	Crisis response (point)	t	P
Gender	Male	97(66.44)	15.91±2.30	1.390	0.167
	Female	49(33.56)	15.27±3.18		
Age (yr)	<30	35(23.97)	18.64±3.73	5.276	0.002
	30 ~ 45	65(44.52)	15.98±4.25		
	>45	46(31.51)	13.04±2.47		
Disease course (yr)	<3	61(41.78)	17.79±3.80	4.639	0.015
	3 ~ 5	40(27.40)	16.39±3.72		
	>5	45(30.82)	12.21±3.23		
Education level	Primary and below	19(13.01)	17.54±3.88	3.757	0.026
	Junior high school or technical secondary school	48(32.88)	16.69±3.30		
	High school or junior college	55(37.67)	15.26±4.80		
	University and above	24(16.44)	13.12±3.30		
Medical Insurance	Medical insurance for urban workers	73(50.00)	15.58±4.85	0.803	0.288
	Medical insurance for urban residents	56(38.36)	15.64±3.28		
	Self-pay and others	17(11.64)	16.28±3.09		
Child-Pugh grade	Grade A	50(34.25)	13.50±3.14	4.314	0.028
	Grade B	53(36.30)	16.27±4.53		
	Grade C	43(29.45)	27.53±3.34		

**Table 3:** Linear regression analysis of general response to crisis

Independent Variables	β	SE	Beta	t	P
Age	-0.490	0.125	-0.185	-7.003	< 0.001
Course of disease	-0.502	0.094	-0.206	-10.763	< 0.001
Education level	-0.332	0.069	-0.199	-8.883	< 0.001
Child-Pugh grade	0.671	0.244	0.115	11.002	< 0.001
Constant terms	3.989	0.778	-	11.982	< 0.001

Note:  $R^2=0.179$ ,  $F=8.903$ ,  $P<0.001$

**Correlation between crisis response level and social support and sense of coherence in 146 patients with hepatic cirrhosis**

According to Spearman analysis, the level of crisis response was negatively correlated with psychological congruence and social support, and the total score of psychological congruence was

positively correlated with the total score of social support ( $P<0.05$ ). It indicated that the higher the score of patients' crisis response level was, the worse the social support was, and the lower the individual's belief in coping with pressure was (Table 4).

**Table 4:** Correlation of crisis response level, social support and psychological consensus in 146 patients with liver cirrhosis

Item	Crisis response	Comprehensible	Controllable	Sense of meaning	Total score of psychological consensus	Objective support	Subjective support	Utilization of support	Total score of social support
Crisis response	1								
Comprehensible	-0.553*	1							
Controllable	-0.602*	0.547*	1						
Sense of meaning	-0.559*	0.595*	0.291*	1					
Total score of psychological consensus	-0.730*	0.770*	0.759*	0.630*	1				
Objective support	-0.543*	0.449*	0.187	0.561*	0.571*	1			
Subjective support	-0.409*	0.611*	0.336*	0.235	0.636*	0.641*	1		
Utilization of support	-0.602*	0.488*	0.477*	0.452*	0.770*	0.610*	0.563*	1	
Total score of social support	-0.701*	0.509*	0.692*	0.650*	0.673*	0.669*	0.602*	0.794*	1

Note: \* $P<0.05$

**Analysis of the moderating effect of crisis response on sense of coherence and social support in patients with cirrhosis**

The moderating effects of crisis response on sense of coherence and social support were analyzed. Crisis response was negatively correlated

with sense of coherence and social support ( $P<0.05$ ). Among them, sense of coherence and social support could be negatively regulated by the sub-item psychological response of crisis response (Table 5).

**Table 5:** Linear correlation analysis of psychological consensus and social support to crisis response

Independent Variables	$\beta$	SE	Beta	t	P
Comprehensible	-0.113	0.010	-0.129	-5.449	< 0.001
Controllable	-0.262	0.179	-0.161	-9.856	< 0.001
Sense of meaning	-0.449	0.174	-0.159	-7.099	< 0.001
Total score of Psychological consensus	-0.572	0.101	-0.049	-4.895	< 0.001
Objective support	-0.196	0.079	-0.062	-6.790	< 0.001
Subjective support	-0.335	0.072	-0.063	-4.002	< 0.001
Utilization of support	-0.224	0.980	-0.130	-5.094	< 0.001
Total score of social support	-0.558	0.107	-0.096	-9.855	< 0.001
Constant terms	5.890	1.174	-	12.899	< 0.001

Note:  $R^2=0.256$ ,  $F=12.889$ ,  $P<0.001$

## Discussion

Crisis response refers to a series of psychological, cognitive and behavioral reactions of individuals who are unable to apply general methods to solve current events. Studies have confirmed that patients with hepatic cirrhosis may have a crisis response during the treatment of disease (10, 11). In this study, the total score of crisis response level in 65 patients was  $(15.69 \pm 5.22)$ , which was similar to the research of Gou et al. (12) who found poor crisis response level in patients with hepatic cirrhosis, largely due to the complexity of the disease, the long course of the disease, the severity of symptoms and the heavy economic burden. Therefore, it is suggested that in nursing work, attention should be paid to the patient's level of crisis response. First, the crisis response level of patients' needs to be evaluated and clarified. Then, personalized guidance ought to be developed according to patients' education level and personal interests to help them master disease-related knowledge and promote patients' acceptance of diseases, so as to improve their compliance and initiative in nursing.

Crisis response level of patients with hepatic cirrhosis was related to age, course of disease, educational level and Child-Pugh grade. The reason is that young patients are mentally immature and full of hope for the future. Hepatic cirrhosis, however, as a disease that seriously affects the quality of life and has a poor prognosis, will lead to a lot of negative emotions such as great pain and anxiety in the group during this period (13, 14), resulting in higher psychological crisis. Young people tend to be more active in social activities and get more information from the Internet that affects and worsens their sense of psychological crisis (15, 16). As hepatic cirrhosis has a long illness trajectory, the disease course is prolonged and patients ultimately develop a better grasp of knowledge related to disease treatment and what to expect from nursing and healthcare.

Thus there is a possibility for the development of a good understanding of the disease that can help

with coping with the illness. This is especially so among patients with higher education levels who are relatively more capable of accepting new knowledge and more able to correctly understand the disease and treatment of cirrhosis, thus reducing patient's psychological crisis. In addition, patients with an estimated better prognostic outcome (Child-Pugh grade) had lighter illness and less physical and psychological burden caused by disease symptoms, so they adopted more active cooperation mode to promote the recovery of disease, which also indicated that psychological resilience was closely related to the disease outcome of patients from another aspect (17-19). Therefore, it is suggested that in clinical nursing, patients under 30 yr old, with low education level, short course of disease and poor Child-Pugh grade should be paid special attention to, education related to the relevant knowledge about cirrhosis should be strengthened for such patients, and psychological counseling should be strengthened, so as to improve the psychological crisis level of patients.

Crisis response was negatively correlated with psychological coherence and social support ( $P < 0.05$ ). Psychological coherence and social support can be negatively regulated by the psychological response, a sub-item of crisis response. This fully showed that the psychological crisis of patients with cirrhosis was closely related with their social support. The results of this study revealed that the psychological crisis of patients with hepatic cirrhosis was negatively correlated with the sense of coherence, and that the sense of coherence was a negative factor affecting the psychological crisis of patients. The reason for this, is that a good sense of coherence can satisfy the internal resources needed by patients, seek for a series of meaningful and positive psychological cognition for diseases, and enhance patients' ability of emotional regulation (20).

Therefore, it is believed that in the process of clinical nursing, the patients' sense of psychological coherence and social support can be improved through corresponding intervention measures, such as targeted psychological intervention, health publicity and education of rele-

vant knowledge about hepatic cirrhosis, and family participatory nursing, to further improve the level of crisis response and promote the prognosis of patients. The psychological crisis was closely associated with levels of social support, a fact also identified by two studies (21, 22). Ultimately, social support helps to reduce the sense of crisis caused by the disease, and helps to establish confidence to overcome the disease eventually reducing the degree of psychological crisis, thus nurses' encouragement of family support and family education are important.

## Conclusion

At present, there are few studies on crisis response capacity and its influencing factors in patients with hepatic cirrhosis internationally, so this study is highly novel. Based on the results of this study, it is suggested that nursing staff should actively adopt crisis assessment scale to determine the crisis response level of patients. At the same time, data such as age, disease course, education level and Child-Pugh grading can be collected to further identify patients with low crisis response level as early as possible and give targeted nursing intervention, so as to help them shorten the hospital stay. In terms of school education, it is suggested that the concept of crisis response level should be incorporated into the teaching of nursing students, so as to promote nurses to have a basic understanding of this concept. Nurse Managers should encourage nurses to develop and use crisis assessment scales to evaluate the crisis response level of patients with hepatic cirrhosis, in order to accurately assess the prevalence of this response and act accordingly.

## Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflict of interest

The authors declare that there is no conflict of interest.

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