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Retrospective Study

Effects of different intervention methods on psychological flexibility, negative emotions and sleep quality in chronic hepatitis B

Therapy combined with education for CHB

Abstract

BACKGROUND

Patients with chronic hepatitis B (CHB) experience many problems, including low psychological flexibility, negative emotions, and poor sleep quality. Therefore, effective nursing interventions are required to reduce these adverse events. According to previous research data, acceptance and commitment therapy (ACT) combined with enabling cognitive-behavioral education (ECBE) can improve patients' psychological and sleep. Therefore, we speculate that this mode of education may also be effective in chronic hepatitis B patients.

AIM

To investigate the effects of different intervention methods on psychological flexibility, negative emotions, and sleep quality in CHB patients.

METHODS

This retrospective study examined clinical and evaluation data on the psychological flexibility, negative emotions, sleep quality, and self-care ability of 129 patients with CHB obtained from electronic medical records. The different nursing intervention methods were divided into a conventional group (69 patients receiving routine nursing) and a

combination group (60 patients receiving ACT combined with ECBE. We observed changes in psychological flexibility, negative emotions, sleep quality, and self-care ability in the conventional and combination groups. Observation items were evaluated using the Acceptance and Action Questionnaire-2nd Edition (AAQ-II), Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), Pittsburgh Sleep Quality Index (PSQI), and Exercise of Self-Care Agency Scale (ESCA).

RESULTS

Compared with the conventional group, the AAQ-II score of the combined group was lower ($F_{\text{between-group effect}} = 8.548$; $F_{\text{time effects}} = 25.020$; $F_{\text{interaction effects}} = 52.930$; all $P < 0.001$), the SAS score ($t = 5.445$) and SDS score ($t = 7.076$) were lower (all $P < 0.001$), the scores of PSQI dimensions were lower ($t_{\text{sleep quality}} = 4.581$, $t_{\text{fall sleep time}} = 2.826$, $t_{\text{sleep time}} = 2.436$, $t_{\text{sleep efficiency}} = 5.787$, $t_{\text{sleep disorder}} = 5.008$, $t_{\text{hypnotic drugs}} = 3.786$, $t_{\text{daytime dysfunction}} = 4.812$); all $P < 0.05$), and the ESCA scores for all dimensions were higher ($t_{\text{health knowledge level}} = 6.994$, $t_{\text{self-concept}} = 5.902$, $t_{\text{self-responsibility}} = 19.820$, $t_{\text{self-care skills}} = 8.470$; all $P < 0.001$).

CONCLUSION

ACT combined with ECBE in patients with CHB can improve psychological flexibility and sleep quality, alleviate negative emotions, and improve self-care.

Key Words: Acceptance and commitment therapy; Empowerment cognitive-behavioral education; Chronic hepatitis B; Psychological flexibility; Negative emotion; Sleep quality

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Core Tip: Chronic hepatitis B (CHB) is an infectious and continuously progressive disease requiring basic treatment supplemented with effective nursing interventions. We

analyzed the clinical data of 129 patients with CHB. We found that acceptance and commitment therapy combined with cognitive-behavioral education can improve the psychological flexibility and sleep quality of patients with CHB, relieve negative emotions, and improve self-care ability, making a breakthrough in the problem of insufficient routine care.

INTRODUCTION

Chronic hepatitis B (CHB) is a chronic infectious disease that frequently occurs. According to the World Health Organization (WHO) in 2017 ^[1], the number of chronic HBV infections worldwide reached 257 million. Approximately 900,000 people worldwide die each year from HBV infection or its complications ^[1]. Due to the mutual influence of physiological, psychological and social factors, chronic hepatitis B patients often induce various sleep disorders, thus reducing the therapeutic effect ^[2]. Drug therapies such as conventional antiviral therapy combined with effective nursing interventions can control disease progression ^[3]. Bedside delivery of health education to the patient improves patient understanding and self-management of their disease ^[4]. However, after receiving education, patients still have an insufficient sense of participation, low mastery of disease knowledge, and no change in a wrong understanding of the disease, and their psychological and behavioural flexible adaptation to the disease is not obvious, and most patients have unresolved problems such as anxiety, depression, and poor sleep. It is related to the lack of indoctrination forms of conventional health education and targeted psychological counselling ^[5]. The lack of routine CHB care is a clinical problem that needs to be resolved. Acceptance and commitment therapy (ACT) is a new type of cognitive behavioral therapy based on functional contextualism and relational reference theory, which promotes individual acceptance of the present and self and increases psychological flexibility ^[6]. Enabling cognitive-behavioral education (ECBE) is a kind of psychological behavior therapy that aims to explore individual-centered problems; help individuals reconstruct cognitive structures; solve emotional, cognitive, and behavioral disorders; and promote the

development of skills and positive beliefs that enable the individual to effectively deal with problems associated with their disease [7]. ACT and ECBE have been applied to the nursing care of patients with diabetes [8], cancer [9], and other diseases [10] and have achieved good results. However, the combination of these two therapies has not been previously investigated in the treatment of CHB. This study explored the effects ACT combined with ECBE on psychological flexibility, negative emotions, and sleep quality in patients with CHB.

MATERIALS AND METHODS

Research object

One hundred and twenty-nine patients with CHB treated at The First People's Hospital of Wenling between January 2021 and June 2022 were retrospectively selected. Patients received routine care or ACT combined with ECBE intervention.

The inclusion criteria were as follows: 1) diagnosis of CHB according to the criteria ; 2) normal vision and hearing function; 3) a complete record of baseline data (sex, age, course of the disease, and liver function); 4) assessment of psychological flexibility, negative emotions, and sleep quality.

The diagnostic criteria for chronic hepatitis B are positive for both serum surface antigen and HBV DNA [11]. Liver function index alanine aminotransferase (ALT) continued to increase, liver histological examination showed hepatitis lesions.

The following exclusion criteria applied: 1) severe sleep disorders or insomnia caused by other diseases; 2) combined heart, liver, kidney, and other organ lesions; 3) viral hepatitis other than CHB; 4) and malignant tumor.

According to the different nursing intervention methods applied, the patients were classified into a conventional group ($n = 69$) and a combination group ($n = 60$). The conventional group received routine nursing care, and the combination group received ACT combined with ECBE. The research concepts used in this study are presented in Figure 1.

Related research data collection

We collected baseline patient data from the electronic medical records, including sex, age, course of disease, and evaluation data of psychological flexibility, negative emotions, sleep quality, and self-care agency.

Detailed intervention methods

Routine nursing: based on principles of nursing practice, nursing staff provided nutritional interventions for patients, medication guidance and safety nursing, early rehabilitation training for patients, and relevant health education. Health education for patients with chronic hepatitis B was delivered through one-to-one communication or distribution of educational manuals to disseminate knowledge on the causes of chronic hepatitis B, treatment methods, risk factors, and other aspects of the disease and provide relevant psychological counseling; daily personal self-care skills in the home setting and life guidance were discussed with patients on discharge from hospital.

ACT: (1) Acceptance perception: medical staff conducted health education using graphic publicity pages or short videos to inform patients of the pathogenesis, routine treatment options, and precautions of chronic hepatitis B, so that patients have an understanding of chronic hepatitis B and accept the ramifications of the disease. (2) Cognitive disengagement: guide family members to encourage patients to actively cooperate with drug treatment or psychotherapy, and strengthen family awareness of chronic hepatitis B to reduce the impact of adverse events or negative emotions on patients. Under the guidance of nutritionists, dietary management and stress reduction training should be strengthened to adjust patients' negative emotions in time. (3) Experience life: encourage patients to exchange experiences with their friends so that they can share the burden of the disease and integrate into the surrounding life and work. The encouragement and support of family and patient friends can enable patients to develop a good understanding of their disease and alleviate negative emotions such as fear, anxiety, and depression. Encourage patients to share their experience and empathize with life experiences, diverting patients' attention. (4) Self-awareness: through patient

communication and doctor-patient communication, patient awareness of the disease should be strengthened while establishing their confidence in **treat** the disease so that they can establish correct cognition and attitude while understanding the disease. (5) Values: with the support of family members and medical staff, patients establish correct social, adjust their mentality, return to society and work, and develop positive attitudes towards life and correct. (6) Positive coping: through drug treatment, psychological intervention, and moderate exercise, patients strengthen their confidence, correct negative emotions, and cooperate actively with treatment.

ECBE: (1) Clarify themes and processes. To understand the most harmful, extensive, and high-incidence problems and in CHB care, the nursing content includes setting out the problem(s), expressing feelings, setting goals, and making plans. (2) Clarify patient needs (problem establishment). To understand the patient's thoughts and educational needs such as changes during illness, daily mood and reasons, family support and care, and patient needs (including disease knowledge, support, and help). (3) scale assessment. Acceptance and Action Questionnaire-2nd Edition (AAQ-II), Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), Pittsburgh Sleep Quality Index (PSQI), and Exercise of Self-Care Agency Scale (ESCA). Master of psychological flexibility, negative emotions, sleep quality, and self-care abilities (4) Goal setting Cognitive aspects: (1) CHB Education. By playing videos, issuing manuals or one-on-one communication, and conducting collective lectures, patients can fully understand the harm caused by CHB, the importance of a good mentality, the importance of drug treatment, and side effects. (2) Diet education. Based on the principles of the health belief model ^[12], a reasonable diet knowledge education plan was developed for patients to understand the importance of nutritional balance and related information. Specific information about nutritional balance: dietary calcium supplements (China's recommended amount of calcium is 800 mg per day), eat more fresh fruits and vegetables, and take in more protein-rich foods (such as milk, poultry, fish). Education was delivered through videos, pictures, animations, and text. Behavior: (1) Improved family support. Family members or spouses of patients were included in the synchronous education program to develop basic

knowledge of CHB nursing and improve their ability to provide psychological and physiological support. At the same time, family members were instructed to create a good family atmosphere and environment for the patients, pay attention to their psychological state, and provide timely counseling to reduce the negative emotions caused by loneliness and family apathy. (2) Improve self-care. Help was provided to patients to understand the importance of self-care and the prevention and treatment of common health problems in CHB. The nursing staff focused on the mental health of the patients, teaching them physical and mental adjustment methods to prevent anxiety and depression.

Observation target

Psychological flexibility: Before intervention, three months after intervention, and six months after intervention, the psychological flexibility of the patients was evaluated using the AAQ-II scale^[13]. The seven items were scored from 1 (never) to 7 (always). The total score was 7-49 points. Higher scores indicated higher empirical avoidance and psychological flexibility. Cronbach's α coefficient of the scale was 0.880, indicating good reliability.

Negative emotions: The SAS and SDS^[14] were used to evaluate the degree of anxiety and depression before and after the intervention (6 mo after the intervention). The two scales were composed of 20 items scored according to a 4-level scoring method (score 1-4 points). The higher the score, the more severe the anxiety and depression.

Sleep quality: The PSQI^[15] was used to evaluate sleep quality before and after the intervention. This scale included the following seven dimensions: sleep quality, sleep time, sleep time, sleep efficiency, sleep disorders, use of hypnotic drugs, and daytime dysfunction. Each dimension was scored on a scale of 0-3 points. Higher scores indicate worse sleep quality.

Self-care ability: Before and after the intervention (6 mo after the intervention), the ESCA^[16] evaluated self-care abilities, including health knowledge level (14 items), self-concept (9 items), self-responsibility (8 items), self-care skills (12 items) and other 4

dimensions(health knowledge level, self-concept, self-responsibility, and self-care skills.). The 43 items were scored using the 5-level scoring method (0-4 points). Higher scores indicated better self-care ability. Cronbach's α coefficient is 0.76-0.87, indicating that the scale has good internal consistency.

Statistical analysis

SPSS 20.0(IBM SPSS Statistics software (version 20.0)) was used to analyze the data. The data were presented as mean and standard deviation and the t-test was compare the difference between two sets of data. One-way analysis of variance (ANOVA) was used to compare the three groups. The Bonferroni t-test was used for multiple comparisons between multiple samples. Repeated-measures analysis of variance was used to compare data at different time points between the groups. The number of cases and chi-square test were used to analyze the count data. A test value $\alpha = 0.05$ was used.

RESULTS

Clinical characteristics

Baseline data such as sex, age, and course of disease were compared between the two groups. All $P > 0.05$, indicating comparability (Table 1).

AAQ-II score

The AAQ-II score in the combination group was lower than that in the conventional group. The AAQ-II scores of the two groups decreased with time, with an interaction effect between group and time ($F_{\text{between-group effect}} = 8.548$; $F_{\text{time effects}} = 25.020$; $F_{\text{interaction effects}} = 52.930$; all $P < 0.001$) (Table 2).

Multiple comparison results of PSQI scores at each time point between the conventional and combination groups showed significant differences in AAQ-II scores between the two time points in each group (all $P < 0.05$) (Table 3).

SAS score and SDS score

The SAS score of the combination group was: before intervention (49.25 ± 5.35), after intervention (37.56 ± 6.11), $t = 11.150$, $P < 0.001$; the SDS score was: before intervention (53.58 ± 7.12), after intervention (41.56 ± 5.38), $t = 10.430$, $P < 0.001$.

The SAS score of the conventional group was as follows: before intervention (48.68 ± 5.52), after intervention (43.27 ± 5.79), $t = 5.618$, $P < 0.001$; the SDS score was: before intervention (54.03 ± 6.69), after intervention (49.20 ± 6.69), $t = 4.241$, $P < 0.001$.

In comparison with the conventional group, the SAS ($t = 5.445$) and SDS ($t = 7.076$) scores of the combination group were lower after the intervention (both $P < 0.001$) (Figure 2).

PSQI score

The post-intervention scores for ²sleep quality, fall sleep time, sleep time, sleep efficiency, sleep disorder, hypnotic drugs, daytime dysfunction, and other dimensions in the combination group and the conventional group were lower than the corresponding pre-intervention scores (all $P < 0.001$). The scores for each dimension in the combined group were lower than those in the combination group (t -values were 4.581, 2.826, 2.436, 5.787, 5.008, 3.786, and 4.812, turn; $P < 0.05$) (Table 4 3).

ESCA score

The pre-intervention ¹scores of health knowledge level, self-concept, self-responsibility, and self-care skills in the combination group were: (33.48 ± 5.36) points, (20.16 ± 3.25) points, (21.58 ± 4.39) points, (31.25 ± 5.54) points; The same pre-intervention scores in the conventional group were: (34.02 ± 4.54) points, (20.67 ± 3.51) points, (21.24 ± 4.13) points, (30.86 ± 6.62) points.

After intervention, the scores of the above dimensions in the combination group were: (51.27 ± 3.39) points, (31.25 ± 4.42) points, (29.17 ± 3.08) points, (43.12 ± 4.24) points. The scores of the above dimensions in the conventional group were: (45.36 ± 5.73) points, (26.17 ± 5.24) points, (25.68 ± 4.42) points, (35.56 ± 5.67) points.

¹ The health knowledge level, self-concept, self-responsibility, and self-care skills scores in the combination and conventional groups were higher after the intervention than those before the intervention (all $P < 0.001$). The scores for each dimension in the combined group were higher than those in the conventional group (t :6.994, 5.902, 5.128, and 8.470; all $P < 0.001$) (Figure 3).

DISCUSSION

As CHB easily progresses to cirrhosis or liver cancer ^[17], there are considerable changes in the psychological, emotional, and living conditions of patients, and effective nursing interventions are needed. Insomnia is a common symptom manifesting in patients with CHB and is mainly caused by an increase in endotoxin levels, unbalanced hormone secretion, and increased psychological burden in patients. Insomnia refers to a decline in sleep quality that seriously affects a patient's quality of life.

We found that the AAQ-II scores of the combination and conventional groups were lower ⁵ after the intervention, and that the AAQ-II scores of the combined group were lower, indicating that ACT combined with ECBE could reduce patient empirical avoidance behavior and enhance psychological flexibility. This is consistent with previous studies on adult patients with chronic pain ^[18]. Psychological flexibility refers to flexible psychological and behavioral adaptations to changing situations during interactions between individuals and the environment ^[19], which is a protective factor for mental health ^[20]. CHB is characterized by progression to cirrhosis or liver cancer and a heavy economic burden, which can easily cause patients to experience various negative emotions and try to escape and control their worries and experiences. ACT guides and encourages patients with CHB to accept all negative and positive experiences with an open and optimistic attitude. After ACT intervention, patients no longer resist, control, or evade CHB but observe and accept it objectively. Patients with CHB can cope more effectively with the stimulation of surrounding environmental factors and take positive actions to reduce their psychological pressure and relieve anxiety and depressive symptoms. In addition, ECBE focuses on four aspects: establishing problems, expressing

emotions, setting goals, and formulating plans. It focuses on patients' psychological changes, unhealthy emotions, and sleep quality, and adopts targeted interventions and supervision to promote patients. It encourages patients to gradually correct escape psychology, anxiety, depression, insomnia, and other problems; improves psychological flexibility; and relieves negative emotions. Research ^[21] confirms that psychological flexibility is closely related to anxiety and depression. According to the results of this study, the SAS and SDS scores of patients receiving ACT combined with ECBE nursing were significantly reduced, indicating that anxiety and depression were significantly alleviated. The results confirmed the effectiveness of the combined intervention in relieving negative emotions in patients with CHB. In this study, the scores of each dimension of the PSQI were lower and the scores of each dimension of the ESCA were higher, demonstrating that ACT combined with ECBE also played a significant role in regulating sleep quality and patient self-care ability. The sleep quality of patients with CHB is much lower^[22]. In the intervention of ACT combined with ECBE, nursing staff developed patient knowledge of CHB and helped to correct misunderstandings about the disease, reducing excessive worrying and negative emotions, and improving sleep quality. The low self-care ability of patients with CHB has been demonstrated ^[23]. Improving self-care ability is the final step in the implementation of ECBE. Nursing staff guide patients to understand the importance of self-care and the prevention and treatment of common health problems associated with CHB and promote patient self-care ability, an important component that is lacking in routine nursing. Furthermore, providing effective relief from negative emotions, such as anxiety and depression, encourages patients to actively cooperate with treatment and related auxiliary interventions, accept guidance and the transmission of nursing knowledge; it also enhances patient understanding of the disease and of nursing measures, indirectly improving the self-care ability of patients ^[24,25]. Some limitations should be noted. The patients in this study were admitted to a single hospital, so the application of these findings to patients treated in different centers needs to be approached with caution and these results need to be corroborated in future studies. Furthermore, this was a

retrospective study and the data may be subject to selection, information, and confounding biases. Therefore, prospective randomized controlled studies are required to obtain more accurate clinical data and generate more robust evidence.

CONCLUSION

The combination of ACT and ECBE in patients with CHB can improve psychological flexibility and sleep quality, alleviate negative emotions, and improve self-care abilities.

ARTICLE HIGHLIGHTS

Research background

Chronic hepatitis B (CHB) is an infectious, progressive disease. Patients experience a heavy psychological burden and severe insomnia symptoms.

Research motivation

Patients with CHB urgently require effective nursing interventions to alleviate mental flexibility, negative emotions, and sleep quality problems.

Research objectives

To analyze the effects of acceptance and commitment therapy (ACT) combined with enabling cognitive-behavioral education (ECBE) on mental flexibility, negative emotions, and sleep quality in CHB patients.

Research methods

We retrospectively analyzed the clinical data of 129 patients with CHB and observed changes and differences in AQ-II, SAS, SDS, PSQI, and ESCA scores after routine nursing and ACT combined with ECBE intervention.

Research results

Compared to patients receiving conventional care, the AAQ-II, SAS, SDS, and PSQI scores in patients receiving ACT combined with ECBE were lower, whereas the ESCA scores were higher.

Research conclusions

Through observation, we put forward the theory that ACT combined with ECBE is effective for CHB patients in China and overcomes the problem of nursing defects in CHB.

Research perspectives

We observed the mental flexibility, negative emotions, and sleep quality of patients with CHB according to two different nursing interventions: routine nursing and ACT combined with ECBE.

Figure 1 Research ideas. ACT: Acceptance and commitment therapy; ECBE: Enabling cognitive-behavioral education; AAQ-II: Action Questionnaire-2nd Edition; SAS: Self-Rating Anxiety Scale; SDS: Self-Rating Depression Scale; PSQI: Pittsburgh Sleep Quality Index; ESCA: Exercise of Self-Care Agency Scale.

Figure 2 SAS score and SDS score. The post-intervention SAS score ($t = 5.445$) and SDS score ($t = 7.076$) in the combination group were lower than those in the conventional group (both $P < 0.001$). ^a $P < 0.05$.

Figure 3 ESCA score. The post-interventions scores of each dimension in the combined group were lower than those in the combination group. ^a $P < 0.05$.

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SIMILARITY INDEX

PRIMARY SOURCES

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