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Improvement in Quality of Life and Activities of Daily Living in Patients with Liver Cirrhosis with the Use of Health Education and Patient Health Empowerment

Authors' Contribution:

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Statistical Analysis C
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Background: The management of quality of life (QoL) in patients with cirrhosis is important due to the chronic nature of compensated cirrhosis. The aim of the study was to evaluate the effect of health education using health empowerment theory in patients with liver cirrhosis.

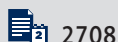
Material/Methods: Between January 2014 and November 2014, 30 patients who were hospitalized with liver cirrhosis patients were recruited to the study, as the study group. Health education was conducted using the principles of health empowerment theory. Between January 2013 and November 2013, 30 hospitalized cirrhosis patients were recruited as the control group, who were given conventional health education. The QoL scores and Health-Promoting Lifestyle Profile II (HPLP II) scores were evaluated at hospital discharge and at two-month follow-up. The health knowledge awareness rate, activity of daily living (ADL), and health-promoting lifestyles were evaluated.

Results: On discharge from the hospital, understanding of the major clinical symptoms, etiology, diet and nutrition, use of medication, treatment, and disease awareness rates were significantly higher in the study group compared with the control group (all $P < 0.05$). There were significant differences in ADL scores between the two groups at two-month follow-up (81.5 ± 15.5 vs. 68.5 ± 15.4 ; $P = 0.006$). All HPLP II scores were higher in the study group compared with the control group at hospital discharge and at two-month follow-up (all $P < 0.05$).

Conclusions: Patient health empowerment can improve the cognitive level and health behaviors of patients with liver cirrhosis, improve their ability to perform ADL, and improve their QoL.

MeSH Keywords: **Control Groups • Health Education • Liver Cirrhosis, Alcoholic • Quality of Life**

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Background

Cirrhosis is a chronic liver disease, which is irreversible and progressive and is associated with complications that include hepatic encephalopathy, and upper gastrointestinal bleeding, leading to repeated relapses and admission to hospital [1–4]. Liver cirrhosis not only results in a heavy burden on society and the families of affected patients but also seriously affects the physical and mental health and lowers the quality of life (QoL) for patients [5–7].

The median survival for patients with cirrhosis is 12 years, and so improving the QoL for patients with cirrhosis is an important aspect of management [8]. Health-related QoL is often more important to patients than outcomes such as mortality rates [9]. The prognosis for patients with cirrhosis is determined by the Child–Pugh score, non-alcoholic etiology, and the patient's body mass index (BMI) [10]. Patients with cirrhosis have specific physical and cognitive symptoms that affect their QoL and that distinguish cirrhosis from other diseases [11–13].

Comprehensive treatment and nursing to reduce the complications and improve QoL is an important part of the management of patients with cirrhosis [14,15]. The empowerment theory was developed in 1960 and the concept of self-help and self-reliance were established in 1970 [16]. Recently, the application of the empowerment theory in mental health and public health has received attention. Some authors have suggested that the application of the empowerment theory to the management of chronic diseases can enhance the motivation of patients and improve independence and self-management [17–19]. However, there have been no previous studies on patient empowerment in the management of cirrhosis.

Therefore, the aim of the study was to evaluate the effect of health education using health empowerment theory in patients with liver cirrhosis. This study included an evaluation of activities of daily living (ADL) and QoL following health education.

Material and Methods

Study design and patients included in the study

This was a prospective study that was approved by the Human Ethics Committee of Yijishan Hospital. The patients signed informed consent to participate in the study. Consecutive patients with cirrhosis hospitalized in the Department of Gastroenterology of Yijishan Hospital, Wannan Medical College between January 2013 and November 2013 were enrolled into the control group. Consecutive patients with cirrhosis hospitalized between January 2014 and November 2014 were enrolled in the study group.

The study inclusion criteria were a diagnosis of cirrhosis according to the revised diagnostic criteria from the Chinese Medical Association [20], or by B-mode ultrasound or computed tomography (CT) imaging, new-onset cirrhosis, a Barthel index (BI) score >20 [21], the ability to independently answer questions, and a Karnofsky performance status (KPS) score of ≥ 60 [22].

The exclusion included a history of psychiatric disease or cognitive impairment, hepatic encephalopathy, a diagnosis of malignancy, severe heart, lung, or brain disease, and Child-Pugh grade C [23].

Preparation before the study began

Five nurses and nurse supervisors from the Department of Gastroenterology participated in the study. They had >7 years of clinical care experience, psychological guidance, and teaching skills, and had the relevant knowledge of cirrhosis. The 2010 Guidelines for Prevention and Treatment of Liver Cirrhosis in China from the Ministry of Health were followed that included knowledge of epidemiology, the causes, and complications of cirrhosis, dietary and treatment guidelines, complications, emergency treatment, psychological counseling, and guidelines on physical exercise.

Data collection

A health record was established for each patient, including the patient's name, age, gender, address, and phone number. All patients completed the activity of daily living (ADL) assessment, including the Barthel index (BI) scores, and the cirrhosis and decompensation stage health knowledge questionnaire within 24 h following hospital admission. The questionnaire included demographic characteristics (gender, age, education), knowledge of cirrhosis (including the etiology, clinical manifestations, complications, and treatment), and compliance with treatment (including medications, diet, cessation of smoking and drinking).

The duration of the study was six months, including follow-up after discharge from the hospital. To ensure that patients understood the rehabilitation program and continued to update their knowledge, patients were required to participate in the program of 'cirrhosis-related knowledge' that was organized by the department. When the patients were discharged from the hospital or 15 days after treatment, they repeated the ADL assessment, including the BI scores, and the cirrhosis and decompensation stage health knowledge questionnaire.

Four-stage intervention

For the control group, nurses and nurse supervisors conducted one-to-one training according to the health education pathway of cirrhosis and decompensation and performed dynamic

evaluations until patients were informed. For the study group, health education was guided by the empowerment theory and included four stages.

Stage 1 was performed from the first to the second day after hospital admission). The personal and lifestyle characteristics of the patients were analyzed in detail at the time of data collection. Open questions were used to guide the patients to describe the disease process in a narrative manner. In the form of discussion, patients were introduced to the pathological changes, common etiology, and pathogenesis of cirrhosis and the decompensation stage, to improve the understanding of the disease. Patients were encouraged to express various ideas related to the disease. The nurses provided insights into the patients' concerns regarding their treatment. Guidance was provided on the importance of management with diet control, medication, and rest. The nurses informed the patients that they could achieve stable disease or clinical improvement through their own efforts, including improved diet and compliance with medications, in an attempt to motivate patients.

Stage 2 was conducted on the third to the fifth day after hospital admission. Based on the findings from the patient questionnaires, the nursing staff helped the patients and their families to understand the risk factors for cirrhosis and helped the patients to identify and reduce risk factors, encouraged the patients to establish health awareness and independence and to change unhealthy lifestyles. Patient diet, clinical findings, including infection, ascites, and hemorrhage were recorded. The nursing staff guided the patients and their families to assist or supervise the patients during their rehabilitation.

Stage 3 was conducted on the sixth to the tenth day after hospital admission. The patients were encouraged to communicate how their disease affected ADL. Psychological factors were evaluated, including a lack of motivation during the rehabilitation process. The nurses discussed again with the patients the importance of a good diet, proper exercise, compliance with medication, maintaining a positive mental state, and encouraged rehabilitation exercises as part of the prevention and treatment of liver cirrhosis.

Stage 4 was conducted on the tenth to the fifteenth day after hospital admission. The patients were encouraged to talk about their understanding of their disease during hospitalization and the problems they should pay attention to after hospital discharge. The nurses discussed self-management skills with the patients, encouraged the patients to overcome difficulties, become independent from caregivers, and increase self-confidence. The nurses helped the patients to further clarify any problems that needed to be corrected, prompting the patients to exert their subjective initiative, establish long-term rehabilitation goals, and develop behavioral plans.

Follow-up

Four weeks after the patients were discharged from the hospital, telephone follow-up was conducted for the two groups. The main aim of the follow-up was to understand behavior control, diet management, drug compliance, and rehabilitation exercise in the patient's daily life. During the follow-up, the questions asked by the patients were answered and the patients were supervised during further follow-up. Two months after the patients were discharged from the hospital, they repeated the ADL assessment, including the BI scores, and the cirrhosis and decompensation stage health knowledge questionnaire.

The health knowledge questionnaire for liver cirrhosis

The health knowledge questionnaire for liver cirrhosis was developed for this study and included questions on the etiology and causes of liver cirrhosis, the main clinical symptoms, the complications, knowledge of diet and nutrition, prevention of progression, knowledge of treatment methods, the influence of psychological factors, rest, and exercise on liver cirrhosis. Know and don't know were used as options and were assigned scores of 1 and 0, respectively. The standard score was calculated as the sum of the scores of the items divided by the total possible score and multiplied by 100%. A higher score indicated a higher level of understanding. A score of 60% was set as an acceptable score. The awareness rate was calculated as the number of known answers divided by the total number of subjects multiplied by 100%. The content validity index (CVI) of the questionnaire was 0.89, and Cronbach's α was 0.91, indicating good validity and reliability.

Assessment of ADL using the BI score

ADL was assessed using the BI score, which included including ten items [21]. The BI scale included eating, ability to transfer from bed to chair, grooming, toilet use, bathing, walking on the ground, going upstairs, dressing, controlling stool, and controlling urination. Each item was divided into four levels according to whether help was needed and the degree of help, including independent, slightly dependent, moderately dependent, and completely dependent, with a total score was 100. A BI score >60 indicated basic self-care; a BI score of 41–60 indicated moderate dysfunction requiring help with ADL; a BI score of 21–40 indicated severe dysfunction with ADL that was dependent on others; a BI score of ≤ 20 indicated a total disability, with ADL completely dependent on others. A higher score indicated better independence.

The Health Promoting Lifestyle Profile II (HPLP II) questionnaire

The Health Promoting Lifestyle Profile II (HPLP II) questionnaire was developed by Walker et al. [24]. The questionnaire

Table 1. Comparison of baseline characteristics between the study group and the control group.

Variable	Study group (n=30)	Control group (n=30)	P-value
Age (years), mean ±SD	61.8±13.0	60.9±12.1	0.721
Gender, n (%)			0.612
Male	15 (50%)	17 (57%)	
Female	15 (50%)	13 (43%)	
Education level, n (%)			0.732
Illiterate	5 (17%)	6 (20%)	
Primary school	7 (23%)	10 (33%)	
Junior high school	13 (43%)	11 (37%)	
High school and above	5 (17%)	3 (10%)	
Ascites, n (%)	17 (57%)	15 (50%)	0.612
Bleeding, n (%)	10 (33%)	8 (27%)	0.573
Infection, n (%)	3 (10%)	0 (0%)	0.081
Length of stay (d), mean ±SD	10.4±5.4	10.0±5.3	0.640

was divided into questions on health responsibility, exercise, nutrition, self-realization, interpersonal relationships, and stress management, and included 52 items. The questionnaire has been translated into Chinese and validated [25]. A Likert 4-grade rating was used, in which ‘never,’ ‘sometimes,’ ‘often,’ and ‘always’ were assigned 1, 2, 3 and 4 points, respectively. A higher score represented a better health behavioral level. The CVI was 0.85 and Cronbach’s α was 0.86, indication good validity and reliability.

Statistical analysis

Data were analyzed using SPSS version 18.0 (IBM, Armonk, NY, USA). Continuous data were presented as the mean \pm standard deviation (SD) and analyzed using the Student’s t-test. Categorical data were presented as frequencies and percentages and analyzed using a chi-squared (χ^2) test. Two-sided P-values <0.05 were considered statistically significant.

Results

Baseline patient characteristics

Thirty patients in the control group and 30 patients in the study group were enrolled. There was no significant difference between the two groups regarding age, gender, educational level, the Barthel index (BI) score, the course of the disease, and other general data (all $P>0.05$) (Table 1).

Comparison of health knowledge for liver cirrhosis between the study group and the control group

There was no significant difference in the rates of awareness and knowledge regarding health issues associated with liver cirrhosis between the two groups at hospital admission (both $P>0.05$). At discharge from the hospital, the understanding of the major clinical symptoms, etiology, aspects of diet and nutrition, daily disease prevention, compliance with medication, treatment, and the total awareness rates were significantly greater in the study group when compared with the control group (all $P<0.05$) (Table 2).

Comparison of the Barthel index (BI) scores between the study group and the control group

The BI score was not statistically different between the two groups on hospital admission ($P=0.053$) and discharge from the hospital ($P=0.051$). There were significant differences in ADL scores between the two groups at two months after hospital discharge ($P=0.006$) (Table 3).

Comparison of the Health Promoting Lifestyle Profile II (HPLP II) scores between the study group and the control group

Comparison of the HPLP II scores between the study group and the control group showed that the scores were significantly higher in the study group compared with the control group at hospital discharge and at two months after hospital discharge (all $P<0.05$) (Table 4).

Table 2. Comparison of health awareness between the study group and the control group.

Knowledge, n (%)	At hospital admission			At discharge		
	Study group (n=30)	Control group (n=30)	P-value	Study group (n=30)	Control group (n=30)	P-value
Etiology and incentive	6 (20%)	7 (23%)	0.754	23 (75%)	16 (52%)	0.058
Major clinical symptoms	12 (40%)	11 (37%)	0.791	25 (83%)	17 (57%)	0.024
Route of transmission	9 (30%)	10 (33%)	0.781	24 (80%)	16 (53%)	0.028
Complications	4 (13%)	3 (10%)	0.688	19 (63%)	12 (40%)	0.071
Diet and nutrition	9 (30%)	8 (27%)	0.774	24 (80%)	16 (53%)	0.028
Daily prevention	5 (17%)	6 (20%)	0.739	25 (83%)	17 (57%)	0.024
Rational medication	7 (23%)	8 (27%)	0.766	26 (87%)	17 (57%)	0.010
Treatment	10 (33%)	11 (37%)	0.787	27 (90%)	19 (63%)	0.015
Effects of psychological factors	8 (27%)	7 (23%)	0.766	23 (75%)	16 (53%)	0.058
Effects of rest and exercise	12 (40%)	13 (43%)	0.793	26 (87%)	20 (67%)	0.067
Total average awareness rate	82 (27%)	84 (28%)	0.855	242 (81%)	166 (55%)	<0.001

Table 3. Comparison of Barthel index (BI) scores between the study group and the control group.

BI score, mean \pm SD	Study group (n=30)	Control group (n=30)	P-value
At admission	30.6 \pm 10.7	32.0 \pm 11.3	0.053
At discharge	43.5 \pm 15.4	42.7 \pm 13.9	0.051
Two months after discharge	80.5 \pm 15.5	68.5 \pm 15.4	0.006

BI – Barthel index.

Table 4. Comparison of the Health Promoting Lifestyle Profile II (HPLP II) scores between the study group and the control group.

Components mean \pm SD	At hospital discharge		Two months after discharge	
	Study group (n=30)	Control group (n=30)	Study group (n=30)	Control group (n=30)
Nutrition	26.4 \pm 3.5	21.5 \pm 3.9	26.3 \pm 3.2	21.2 \pm 4.1
Interpersonal relationships	24.5 \pm 3.7	20.5 \pm 4.6	27.0 \pm 4.2	22.3 \pm 3.3
Pressure management	22.3 \pm 3.6	19.2 \pm 3.2	24.7 \pm 3.3	20.2 \pm 3.2
Self-actualization	27.0 \pm 3.2	19.3 \pm 4.2	28.7 \pm 3.2	21.7 \pm 2.9
Health responsibility	24.3 \pm 4.7	17.1 \pm 3.3	26.4 \pm 3.3	19.2 \pm 4.7
Exercise	25.8 \pm 4.3	17.5 \pm 3.3	24.5 \pm 3.3	15.8 \pm 3.6
Total score	147.6 \pm 18.4	116.3 \pm 18.9	159.2 \pm 17.7	125.6 \pm 19.8

HPLP II – Health Promoting Lifestyle Profile II. All P<0.05. Study group vs. control group.

Discussion

Managing patient quality of life (QoL) has been shown to improve long-term survival in patients with compensated cirrhosis [8]. However, no previous study has examined patient empowerment in the management of cirrhosis. Therefore, this study aimed to evaluate the effect of health education using health empowerment theory in patients with liver cirrhosis. The results showed that the health empowerment theory can improve the cognitive level and health behaviors of patients with liver cirrhosis, improve their ability to care for themselves independently and improve their QoL.

The findings of this study showed that the average awareness rates of health knowledge in patients with liver cirrhosis on hospital admission in the control group and the study group were 28.0% and 26.7%, respectively, which did not reach the acceptable score of 60%, indicating that the health knowledge level of patients with cirrhosis was low. A previous pilot study showed that only 54% of patients with cirrhosis could recall the information given to them by their physician [26]. These results highlight the need for health education in this patient population to help patients to understand their own risk factors for liver cirrhosis and to consciously change their unhealthy lifestyles, including improving their diet, medication, rest, nutrition, and exercise.

In this study, following intervention based on empowerment theory, the patients in the study group had improved health knowledge of liver cirrhosis at hospital discharge, specifically about the major clinical symptoms, etiology, diet and nutrition, daily prevention, rational use of medication, and treatment. No previous study has examined patient empowerment in the management of cirrhosis, but these results are supported by results observed in other chronic conditions such as diabetes, chronic heart disease, chronic vascular disease, uremia, chronic obstructive pulmonary disease, and cancer [17,27–29]. An ongoing clinical trial is being conducted to evaluate a patient-oriented education management protocol for patients with decompensated cirrhosis [30]. Such interventions have been shown to help patients to better understand their disease resulting in an improvement in their self-management and QoL, and reduction in their symptoms of anxiety and depression [31].

In the present study, there was no difference in the activity of daily living (ADL) scores between the two groups at discharge from the hospital, but the ADL scores were significantly higher in the study group compared with the control group at two-month follow-up after hospital discharge. The traditional forms of health education provided by the nurses that may

have resulted in patient compliance during their hospital stay, tend to be lost with time after discharge. However, health education guided by empowerment theory stimulated and enhanced patient compliance as the patient felt more in control of the management of their own disease, even after discharge from the hospital. This finding suggests that in the absence of patient empowerment, health education should be continued to extend its effects outside the hospital.

Liver cirrhosis is a health behavior-related disease and unhealthy behavior is an important factor in its pathogenesis and recurrence [1–4]. Health education guided by the empowerment theory helps patients to identify and consider their own risk factors, encourages patients to establish health awareness of self-help and self-sustainment, and actively changes unhealthy behaviors. Some investigators believe that the individual's concept of health influences their choice of lifestyle [32]. In the present study, we found that after receiving health education guided by the empowerment theory, patients had a better sense of responsibility for their own health, had confidence in rehabilitation, co-operated better with medical staff, set rehabilitation goals, actively took rehabilitation exercise, and actively participated in various forms of educational activities about liver cirrhosis prevention after hospital discharge. The present study showed that the total Health Promoting Lifestyle Profile (HPLP II) score and the score in each dimension following hospital discharge and at two-month follow-up after discharge was higher in the study group compared with the control group. Therefore, using patient empowerment increased the patient's sense of control over their life and their disease.

This study had several limitations. This was a small study conducted at a single center. Also, no cost-effective analysis was performed. The impact of empowerment on the biochemical markers of cirrhosis was not assessed. Additional studies are required to validate and develop these initial results.

Conclusions

Health education guided by patient empowerment theory was beneficial to the active rehabilitation of patients with liver cirrhosis. It also improved the activities of daily living (ADL) of patients with liver cirrhosis, motivated them to take responsibility for healthy behaviors, and improved their quality of life (QoL).

Conflict of interest

None.

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