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*Original Article*

# Effects of peer education on psychological stress, attitude towards disease and treatment compliance in patients with chronic hepatitis B

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**Abstract:** Objective: This study aimed to investigate effects of peer education on psychological stress, attitude towards disease and treatment compliance in patients with chronic hepatitis B. Methods: A total of 105 patients with chronic hepatitis B were included and divided into the group A (routine nursing) and group B (peer education plus routine nursing). Self-rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), knowledge of disease and medication, Medical Coping Modes Questionnaire (MCMQ), Exercise of Self-care Agency Scale (ESCA), scores of medication compliance and satisfaction of nursing were analyzed between the two groups. Results: After intervention, the scores of SAS, SDS in the group B were lower as compared to those in the group A ($P$<0.05). The understanding of disease and medication in the group B were better than that in the group A ($P$<0.05). Compared with the group A, the scores of facing in the group B were higher and the scores of avoiding and yielding were lower ($P$<0.05). The scores of self-concept, self-care responsibility, self-care skills, health knowledge in the group B were higher than those in the group A ($P$<0.05). The scores of MMAS-B and nursing satisfaction in the group B were also higher than those in the group A ($P$<0.05). Conclusion: Peer education can reduce psychological stress, develop positive attitude towards disease and improve treatment compliance in patients with chronic hepatitis B.

**Keywords:** Chronic hepatitis B, peer education, psychological stress, attitude towards disease, treatment compliance

## Introduction

Chronic hepatitis B is a serious infectious disease with clinical manifestations of liver pain, abdominal distension, nausea, fatigue, etc. [1]. In severe cases, there are even splenomegaly, hepatic palm, spider nevus, chronic liver disease, and persistent liver dysfunction [2]. Long-term antiviral treatment is effective. However, its efficacy depends on the patient's medication compliance. Poor medication compliance may increase the fatality rate and the medical costs [3].

Due to the long course of medicine treatment, some patients lack correct knowledge and understanding of antiviral therapy, leading to psychological repellence. Moreover, non-compliance behaviors may occur over time, and some patients may even stop taking medication without permission [4, 5]. The patients with chronic hepatitis B not only suffer from physical pain, but also bear greater economic and psychological pressure [6]. Clinical studies showed that 18.4% of patients stopped taking medication because they did not want others or relatives to know about their disease and they held evasive attitudes towards the diseases [7, 8]. Therefore, the shortage of family support and social discrimination can easily cause depression, anxiety and other negative emotions, reducing medication compliance [9]. Therefore, we should provide comprehensive psychological, social, information support for patients with chronic hepatitis B in a scientific and reasonable way [10].

Peer education is an approach to health promotion in which community members are supported to promote health-enhancing change among their peers. Peer education is the teaching or sharing of health information, values and behavior to educate others who may have similar social backgrounds or life experiences, which is clinically believed to provide an important support network for people facing difficulties [11,

12]. At present, peer education has been applied in clinical nursing practice in various fields at home and abroad. Routine nursing cannot meet the increasing needs of patients. For this reason, this study combined peer education with routine nursing, providing a basis for the innovation and feasibility of nursing model.

## Materials and methods

### *Materials*

The general clinical data of 105 patients with chronic hepatitis B were collected. Patients were divided into the group A (n=52, routine nursing) and group B (n=53, peer education on the basis of routine nursing). Group A included 33 males and 19 females aged 46.58 ± 3.29 years, with the course of disease of 5.28 ± 0.16 years, while group B included 35 males and 18 females aged 46.62 ± 3.21 years, with the course of disease of 5.32 ± 0.11 years.

Criterion for inclusion: the patients (1) diagnosed with chronic hepatitis B; (2) with decent comprehension, reading and writing skills; (3) with ability to use smartphone; (4) without use of antiviral drug before enrollment. This study was approved by the medical ethics committee of the First People's Hospital of Wenling.

Criterion for exclusion: the patients (1) with serious complications; (2) with writing, language, or hearing-related disorders; (3) with severe mental or physical disorders; (4) withdrawal.

### *Methods*

Group A received routine nursing. The patients were assessed on admission. The nurses introduced the hospital environment to the patients, explained the knowledge related to antiviral drugs, and made them have a good understanding of the do's and don'ts with regard to medication. Based on the patients' psychological status, psychological interventions were strengthened. Nurses supervised patients' medication daily. At the time of discharge, the patient was instructed to record a medication diary and be followed up by telephone.

Group B received peer education in addition to routine nursing.

Selection of peer educator: Considering the privacy of patients with chronic hepatitis B, peer educators were recruited from patients admitted to our hospital for treatment or reexamination.

Inclusion criteria for peer educator: patients who signed informed consent; those with voluntary participation; those who received antiviral therapy for more than 1 year; those who were willing to share recovery experience; those with good compliance; those with well controlled condition without drug resistance; those with educational level of high school or above; those with normal communication skills; those with warm and cheerful personality, and those who were able to communicate by WeChat.

Training of peer educator: A total of 10 peer educators were enrolled in the study to receive unified training. The training sessions included basic knowledge related to disease treatment, the importance and necessity of long-term oral antiviral therapy, the do's and don'ts during taking medicine, early symptoms of resistance, and common psychological problems. Training methods included multimedia, health education and role playing, *etc*. At the end of the training, all peer educators were assessed as qualified before engagement.

Peer education: (1) Each peer educator was responsible for 6-8 patients, establishing a treatment group, and creating a WeChat group to facilitate communication, sharing treatment experience and discussion of problems. Thereafter, peer educators could share their experience of antiviral treatment with the group, and taught the patients how to face the disease and treatment in a positive and optimistic attitude. Meanwhile, they also shared the methods of medication reminder, and instructed the patient to purchase drugs via official stores and channels. Peer educators could also interact with patients to encourage them to actively express their opinion, ideas and their inner concerns, and give suggestions after communication. Peer educators also needed to emphasize the potentially serious consequences of not strictly following medical advices, and inform patients of the cycle of post-discharge examination. (2) Regular team activities: After the patients were discharged from the hospital, peer educators regularly organized educational activities with patients according to the work plan formulated by the specialist nurses. The activities lasting 1-2 hours

were carried out at the end of each month. Prior to each activity, peer educators informed patients in the WeChat group and instructed patients to bring a medication diary. During the activity, peer educators first explained to patients the do's and don'ts in daily life. Peer educators checked the patient's medication diary one by one and introduced a topic. Then they discussed with patients and encouraged them to actively express their own needs and opinions. Patients with good medication compliance acted as role-models and were encouraged to share their medication experience. For patients with relatively poor medication compliance, they were encouraged to tell the underlying reasons. At the same time, peer educators provided targeted psychological counseling with regard to the psychological status of each patient, so as to guide patients to get out of the psychological stress as soon as possible, and face the disease and treatment process with a positive and optimistic attitude. (3) Follow-up with WeChat: Peer educator exchanged information with patients by WeChat, ensuring each patient of taking medication on a daily basis. Their degree of knowledge was evaluated by questions with regard to antiviral drug name, specifications, missed dosage, medication requirements, and subsequent follow-up. Peer educators could strengthen personalized education guidance for patients based on their answers. For those with unsatisfactory response, they were educated through WeChat. Peer educators encouraged patients to make friends and remind each other for follow up. Both groups were given 1 year of intervention.

*Outcome measurement*

(1) Psychological condition [13]: Before and after intervention, patients in both groups were evaluated by Self-rating Anxiety Scale (SAS), threshold of which is 50, and Self-Rating Depression Scale (SDS), threshold of which is 53. Higher scores stand for the more serious anxiety and depression. (2) Knowledge of disease and medication [14]: Before and after intervention, questionnaires on the use of antiviral medication for chronic hepatitis B were used to evaluate medical knowledge of patients. Knowledge evaluation for antiviral drug included dosage forms, name, effects and do's and don'ts, medication time, *etc*. Knowledge evaluation for oral antiviral drug included do's and don'ts during administration, adverse reactions, resistance, adverse reactions after withdrawal, subsequent visit requests, liver function and HBV quantitative values, *etc*. The knowledge of disease was scored on a 3-point Likert scale (1=I know nothing, 2=I have a little knowledge, 3=I know very well). High scores suggest the more comprehensive knowledge of disease and medication. (3) Attitudes toward diseases [15]: Medical Coping Modes Questionnaire (MCMQ) was used to evaluate the attitudes towards disease of the two groups, including facing, avoiding and yielding. High scores stand for the strong tendency in each item. (4) Self-care ability [16]: Exercise of Self-care Agency Scale (ESCA) was used to evaluate the self-care ability of patients in the two groups. There were 43 items in terms of self-concept, self-care responsibility, self-care skills and health knowledge. They were scored on a 0-4 Likert scale. (5) Medication compliance [17]: Before and after intervention, Morisky Medication Adherence Scale (MMAS-B) was used to evaluate the medication compliance, covering 0-8 points. High score indicates high medication compliance. (6) Nursing satisfaction [18]: The customized nursing satisfaction questionnaire (100 points in total) was used to evaluate the nursing satisfaction of the two groups, including nursing attitude, skills, and professional attitude. High score indicates high nursing satisfaction.

*Statistical analysis*

SPSS22.0 was adopted to analyze the data. Measurement data were presented by the form of mean ± SD, and student's t test was employed to compare differences between two groups when data follows a Gaussian distribution; otherwise, Mann-Whitney U test was used. Count data were presented as [n (%)] and Chi-squared test was adopted to compare differences between two groups. $P<0.05$ denotes significant difference.

## Results

*Baseline data*

No significant difference was found in gender, age, course of disease, education level and oral antiviral medication between the two groups ($P>0.05$) (**Table 1**).

**Table 1.** General clinical indicators [n (%)]/($\bar{x}$ ± sd)

| Material | | Group A (n=52) | Group B (n=53) | $t/X^2$ | *P* |
|---|---|---|---|---|---|
| Gender (person) | Male | 33 (63.46) | 35 (56.00) | 0.076 | 0.782 |
| | Female | 19 (36.54) | 18 (33.96) | | |
| Age (year) | | 46.58 ± 3.29 | 46.62 ± 3.21 | 0.063 | 0.949 |
| Course of disease (year) | | 5.28 ± 0.16 | 5.32 ± 0.11 | 1.495 | 0.138 |
| Education (person) | | | | 0.635 | 0.968 |
| Primary school or junior high school | | 16 (30.77) | 13 (24.53) | | |
| High school | | 25 (48.08) | 26 (49.06) | | |
| University and above | | 11 (21.15) | 14 (26.42) | | |
| Oral antiviral medication (person) | | | | 0.025 | 0.859 |
| Entecavir Dispersible Tablets | | 38 (73.08) | 41 (77.36) | | |
| Entecavir capsule | | 10 (19.23) | 9 (16.98) | | |
| Tenofovir | | 4 (7.69) | 3 (5.66) | | |

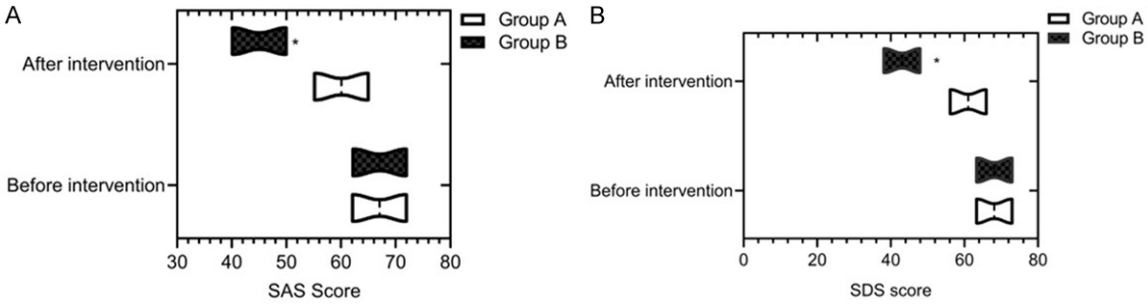


**Figure 1.** Physiological condition. A. The scores of SAS were compared between the two groups before intervention, *P*>0.05; scores of SAS in the group B Were lower than those in the group A After intervention, *P*<0.05; B. The scores of SDS were compared between the two groups before intervention, *P*>0.05; scores of SDS in the group B Were lower than those in the group A After intervention, *P*<0.05. *compared to group A, *P*<0.05.

**Table 2.** Knowledge of medication ($\bar{x}$ ± sd, score)

| Group | Before intervention | After intervention |
|---|---|---|
| Group A (n=52) | 51.12 ± 1.25 | 55.69 ± 2.18# |
| Group B (n=53) | 51.18 ± 1.19 | 68.52 ± 3.69#,* |
| *t* | 0.252 | 21.639 |
| *P* | 0.802 | 0.000 |

#Compared to previous condition, *P*<0.05; *Compared to group A, *P*<0.05.

*Peer education improves psychological status*

There was no significant difference in the scores of SAS and SDS between the two groups before intervention (*P*>0.05). The scores of SAS and SDS after intervention were reduced in the two groups than those before intervention (*P*<0.05). The scores of SAS and SDS in the group B were significantly lower as compared with those in the group A (*P*<0.05) (**Figure 1**).

*Peer education increases knowledge of medication*

There was no significant difference in the knowledge of medication between the two groups before intervention (*P*>0.05). The scores of knowledge of medication were improved in the two groups after intervention (*P*<0.05). In comparison with group A, the scores of knowledge of medication in the group B were significantly higher (*P*<0.05) (**Table 2**).

*Peer education develops attitudes towards diseases*

There was no significant difference in the scores of avoiding, facing, and giving up between the two groups before intervention (*P*> 0.05). The scores of avoiding, facing, and yielding were reduced in the two groups than those before intervention (*P*<0.05). In contrast

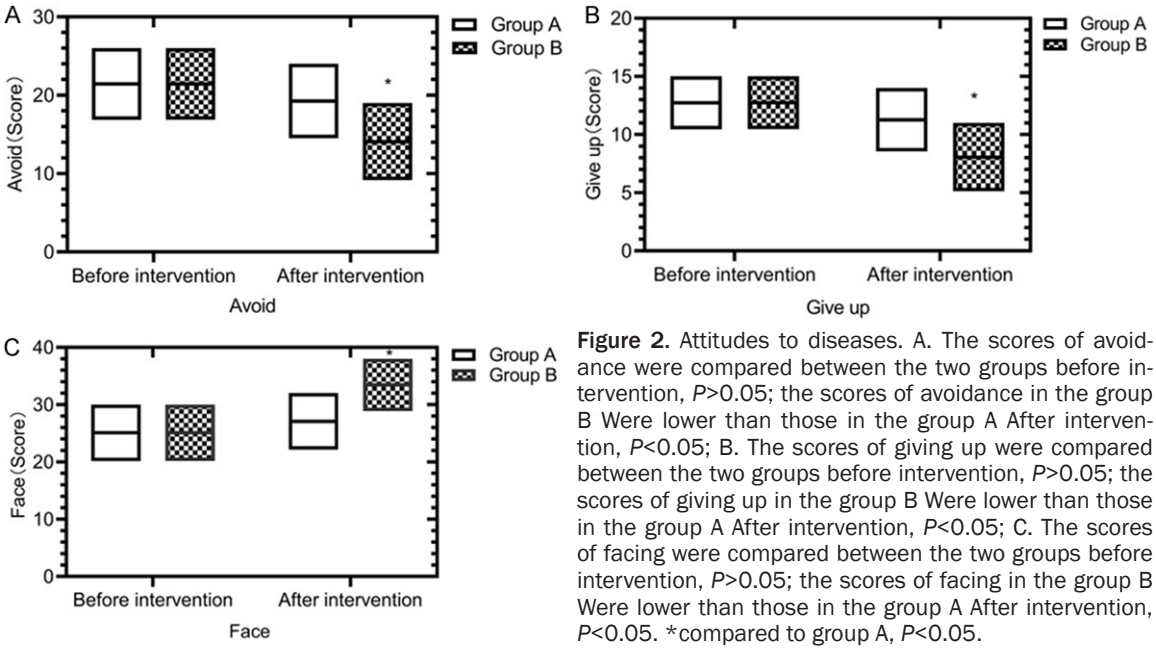


**Figure 2.** Attitudes to diseases. A. The scores of avoidance were compared between the two groups before intervention, $P>0.05$; the scores of avoidance in the group B Were lower than those in the group A After intervention, $P<0.05$; B. The scores of giving up were compared between the two groups before intervention, $P>0.05$; the scores of giving up in the group B Were lower than those in the group A After intervention, $P<0.05$; C. The scores of facing were compared between the two groups before intervention, $P>0.05$; the scores of facing in the group B Were lower than those in the group A After intervention, $P<0.05$. *compared to group A, $P<0.05$.

to group A, the scores of avoiding, facing, and yielding in the group B were significantly lower ($P<0.05$) (**Figure 2**).

*Peer education improves self-care ability*

There was no significant difference in the scores of self-concept, self-care responsibility, self-care skills, health knowledge between the two groups before intervention ($P>0.05$). Those scores in the group B were higher than those in the group A after intervention ($P<0.05$) (**Figure 3**).

*Peer education improves medication compliance*

There was no significant difference in the scores of MMAS-B between the two groups before intervention ($P>0.05$). The group B showed higher scores of MMAS-B than the group A after intervention ($P<0.05$) (**Table 3**).

*Peer education improves nursing satisfaction*

The nursing satisfaction in the group B was 95.18 ± 2.28, significantly higher than that of 71.12 ± 2.15 in the group A (**Table 4**).

## Discussion

Long-term oral administration of antiviral drugs is one of the common treatment options for chronic hepatitis B, and the efficacy of antiviral treatment is closely correlated to medication compliance [19]. Due to the incomplete clearance of chronic hepatitis B virus and strong contagion, patients with chronic hepatitis B are prone to low self-esteem, depression and negative emotions [20]. In addition, severe infectious diseases, inability to undertake heavy physical work, complications and medical costs can also bring a heavy psychological burden on the patients, making them feel guilty [21]. Patients with chronic hepatitis B will have a sense of loneliness and helplessness [22]. In this study, compared with the group A, the scores of SAS and SDS were lower in the group B after intervention ($P<0.05$), suggesting that peer education could alleviate psychological pressure. The mechanism may be that peer educators and patients have similar backgrounds and experiences, so they can talk and listen to each other, and provide psychological support for each other under common language and topics [23]. The results of this study also showed that the scores of avoiding, facing, and giving up in the group B were significantly lower than those in the group A ($P<0.05$), suggesting that peer education can change the patients' attitudes to disease. Peer educators can share correct behavioral skills, concepts and information with patients, provide emotional support and improve their self-denial attitude and confidence.

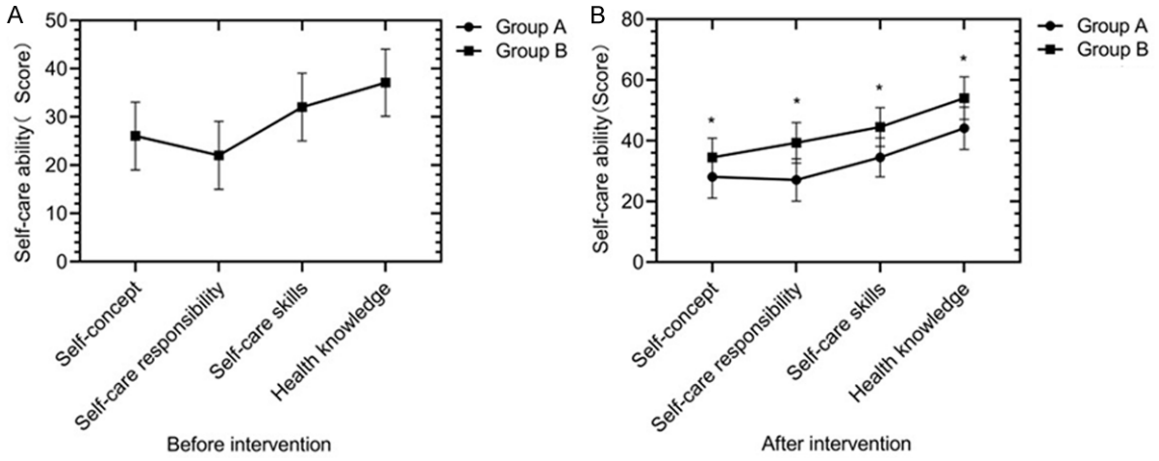


**Figure 3.** Self-care ability. A. The scores of self-concept, self-care responsibility, self-care skills, and health knowledge were compared between the two groups before intervention, $P>0.05$; B. The scores of self-concept, self-care responsibility, self-care skills, and health knowledge in the group B Were lower than those in the group A After intervention, $P<0.05$. *Compared with group A, $P<0.05$.

**Table 3.** Scores of MMAS-B ($\bar{x}$ ± sd, score)

| Group | Before intervention | After intervention |
|---|---|---|
| Group A (n=52) | 3.15 ± 0.15 | 5.16 ± 0.22# |
| Group B (n=53) | 3.19 ± 0.12 | 7.18 ± 0.28#,* |
| *t* | 1.510 | 41.160 |
| *P* | 0.134 | 0.000 |

#Compared to previous condition, $P<0.05$; *Compared to group A, $P<0.05$.

**Table 4.** Nursing satisfaction ($\bar{x}$ ± sd, score)

| Group | Score of nursing satisfaction |
|---|---|
| Group A (n=52) | 71.12 ± 2.15 |
| Group B (n=53) | 95.18 ± 2.28* |
| *t* | 55.610 |
| *P* | 0.000 |

*Compared to group A, $P<0.05$.

Some studies have shown that patients' knowledge of disease and medication had a positive impact on treatment effects and medication compliance. In this study, scores of knowledge of medication in the group B were significantly higher ($P<0.05$) than those in the group A, suggesting that peer education was conducive to improving knowledge of disease and medication in chronic hepatitis B patients, and strengthened health education and medication guidance resulted in better knowledge of medication and disease. Zhu et al. also found that the scores of knowledge of disease and medication of patients in the peer education group after intervention were significantly higher than those in the control group, which was highly consistent with the results of this study and further proved the effectiveness of peer education [24]. To explore its mechanism of action, in the process of hospitalization, medical staff strengthened repeated health education and medication guidance for patients so that they achieved a good grasp of disease and knowledge of medication. However, the post-discharge treatment plan was generally not well implemented due to work and family-related pressures [25]. During peer education, peer educators can share experience associated with medication and treatment to improve patients' medication compliance. Furthermore, patients can get emotional supports from peer educators, and their knowledge of disease and medication can be strengthened [26]. This study manifested that the scores of self-concept, self-care responsibility, self-care skills, health knowledge in the group B were higher than those in the group A ($P<0.05$), suggesting that those indicators were improved after peer education. Peer educators and patients regularly carry out activities to share self-management, self-monitoring and medication experience with each other in active learning strategies, and improve self-care ability [27]. Peer education activities can create a pleasant and easy communication atmosphere, thus enhancing the sense of belonging. Role playing can make patients' memories last longer. WeChat education and communication after discharge is convenient and effective, which enables patients to get support not only from medical staffs but

also from fellows, thus greatly improving nursing satisfaction [28].

The course of antiviral treatment for patients with chronic hepatitis B is long, most of which are completed outside the hospital. There is no correct information support and supervision from medical staffs. Therefore, most patients will gradually forget the importance and necessity of antiviral treatment, and then they will not follow up. Non-compliance behaviors such as drug withdrawal and missed drug administration will occur and there is a close correlation between drug compliance and treatment effect. Therefore, it is necessary to improve the patient's medication compliance [29]. In the study, the scores of MMAS-B in the group B were higher than those in the group A ($P<0.05$), suggesting that peer education is beneficial to improve medication compliance.

Peer education is one of the effective behavioral intervention strategies, which focuses on improving the patient's self-management ability. Through the experience sharing between peer educators, it is helpful to correct the patient's misunderstanding of the disease, and enhance their confidence and abilities in self-management, behavioral restraint ability and self-care. Secondly, peer educators have received systematic and scientific training, fully realized the benefits of taking medications strictly in accordance with the doctor's orders, and have deep experience in self-monitoring of adverse reactions. They can be role models to patients. Therefore, the patient's compliance with medication is significantly improved after peer education.

In conclusion, peer education is beneficial to reduce psychological pressure, and improve the attitude towards disease, knowledge of disease and medication, medication compliance as well as nursing satisfaction in patients with chronic hepatitis B. However, there are some deficiencies in this study, such as small sample size, so it is still necessary to expand the sample size, extend observational duration in the future to obtain more valuable results.

## Disclosure of conflict of interest

None.

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