Path Analysis of the Influence of Self-Esteem Level on Disease-Related Stigma in Patients with Chronic Hepatitis B

Dezhen Cui, Peixiang Chen, Shan OuYang*

Department of Infectious Diseases, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, Guangdong, China

*Author to whom correspondence should be addressed.

Abstract: This study aimed to investigate the pathways by which self-esteem affects stigma in patients with chronic hepatitis B (CHB). A survey was conducted on 201 hospitalized CHB patients at the department of infectious diseases in a tertiary hospital in Guangzhou. Data were collected using various scales and analyzed with SPSS 24.0. The findings indicated that 66.2% of patients experienced severe stigma. Self-esteem was positively correlated with stigma and its dimensions ($r = 0.175$–0.341, $P < 0.05$), emerging as a significant factor influencing stigma scores, negative self-evaluation, perceived humiliation, and secondary discrimination. Further analysis revealed that self-esteem indirectly affected stigma by mediating coping styles, perceived social support, and disease cognition. This study elucidates the mechanism of self-esteem in shaping stigma among CHB patients and provides a theoretical basis for targeted interventions.

Keywords: Chronic hepatitis B; Self-esteem level; Stigma; Influence pathway

1. Introduction

Chronic hepatitis B virus (HBV) infection represents a significant global public health challenge, posing substantial risks to human health [1–3]. Due to its contagious nature, individuals with chronic HBV often experience societal discrimination, leading to stigmatization [4]. Stigma, as a negative psychological experience, not only harms mental health but also diminishes quality of life and undermines treatment adherence and prognosis [5–10]. For example, Yu et al. demonstrated in a study of patients with schizophrenia that stigma significantly reduces the quality of life of patients, mediated by social support and coping styles [5]. Similarly, Luo et al. reported a positive correlation between stigma and anxiety/depression in patients with inflammatory bowel disease [10]. Among HBV carriers, Yu et al. showed that higher levels of stigma increase the risks of

treatment discontinuation and disease progression [8]. Huang et al. also identified stigma as a critical factor affecting healthcare-seeking behaviors and quality of life [9]. Self-esteem, defined as an individual's overall evaluation of their self-worth, plays a crucial role in coping with disease and external stressors. Existing research suggests a connection between self-esteem and stigma, although the specific mechanisms are not fully understood [15, 18]. Given China's high burden of HBV infection, it is essential to understand the mechanisms underlying stigma in this population. This study explores the pathways through which self-esteem influences stigma in chronic hepatitis B (CHB) patients, providing insights that could inform psychological interventions.

2. Participants and methods

2.1. Participants

Using cluster sampling, 201 eligible CHB patients hospitalized in the Department of Infectious Diseases at the Third Affiliated Hospital of Sun Yat-sen University in Guangzhou from August 2018 to January 2019 were enrolled. Of 220 distributed questionnaires, 209 were returned, with 8 excluded due to incomplete data. The sample size was determined based on a pre-survey and formula calculations, with an additional 15% to ensure adequacy.

Inclusion criteria: Diagnosed with CHB, hepatitis B-related cirrhosis, or liver failure; ≥18 years old; literate; informed consent.

Exclusion criteria: Dementia, severe dysarthria/aphasia, co-infection with HCV/HEV/HIV, malignancy, severe dermatological or systemic diseases, or comorbid psychiatric disorders.

2.2. Methods

2.2.1. Instruments

General information questionnaire: A self-designed questionnaire covering socio-demographic data (e.g., age, gender, marital status) and disease-related information (e.g., antiviral treatment status, disease stage).

Stigma scale for chronic hepatitis B carriers: The first domestically developed scale for this population, validated for reliability and validity. It includes five dimensions (external discrimination, negative self-evaluation, perceived humiliation, illness concealment, and secondary discrimination) with 23 items rated on a 5-point Likert scale.

Social support rating scale (SSRS): Developed by Xiao Shuiyuan, this 10-item scale assesses social support across three dimensions: objective support, subjective support, and support utilization.

Simplified coping style questionnaire: Developed by Xie Yaning for Chinese populations, this 20-item tool measures active and passive coping strategies.

Rosenberg self-esteem scale (SES): Widely used in psychological research in China, this 10-item scale assesses global self-worth and self-acceptance using a 4-point rating system.

2.2.2. Data collection

After obtaining informed consent, questionnaires were administered in a quiet environment. Participants received detailed instructions and completed the questionnaires independently. Completed forms were collected on-site, checked for completeness, and verified for data quality.

2.2.3. Statistical analysis

Data were entered using Epidata and analyzed with SPSS 24.0. Normally distributed continuous variables were described as mean ± SD and compared using *t*-tests or ANOVA; non-normally distributed variables were expressed as median (IQR) and analyzed via non-parametric tests. Pearson or Spearman correlation analyses were applied to assess variable relationships. Multiple linear stepwise regression was conducted with stigma and its dimensions as dependent variables and statistically significant factors as independent variables.

2.2.4. Quality control
Questionnaires were designed based on literature reviews and expert consultations. A pilot survey was conducted to refine the tools. Anonymous data collection was enforced, with logical, computational, and entry checks during data collection and input. Invalid responses were discarded.

3. Results
3.1. Participant characteristics
Among the 201 patients included in this study, the age range was 18–76 years, with a mean age of 43.63 ± 11.04 years. Males accounted for 82.1% of the cohort; 73.1% were employed; 90.5% were married; 49.8% had primary or middle school education; and 69.2% received antiviral therapy for HBV. Clinical diagnoses included chronic hepatitis B (52.2%), hepatitis B-related cirrhosis (28.9%), and hepatitis B-related liver failure (18.9%).

3.2. Stigma, social support, coping styles, and self-esteem
33.8% of patients reported mild stigma, while 66.2% experienced severe stigma, with a mean stigma score of 2.72 ± 0.74. The dimensions of stigma, ranked from highest to lowest, were secrecy (3.24 ± 0.96), perceived humiliation (2.76 ± 0.88), negative self-evaluation (2.74 ± 0.97), external discrimination (2.58 ± 0.78), and secondary discrimination (2.16 ± 0.81). The total social support score was 40.48 ± 7.89, passive coping levels showed statistically significant differences from norms ($P < 0.001$), and the self-esteem score (20.52 ± 3.89) also significantly differed from norms ($P < 0.001$). Detailed data are presented in **Table 1**.

Table 1. Current status of stigma, social support, coping styles, and self-esteem in hospitalized chronic HBV patients (n=201)

Item	*n* (%)	Mean ± SD	Norm	*t*	*P*
Proportion of stigma					
Mild	68 (33.8%)				
Severe	133 (66.2%)				
Stigma score		2.72 ± 0.74			
External discrimination		2.58 ± 0.78	2.71 ± 0.72	-2.276	0.024*
Negative self-Evaluation		2.74 ± 0.97	2.87 ± 0.87	-1.995	0.052
Perceived humiliation		2.76 ± 0.88	2.85 ± 0.75	-1.425	0.156
Secrecy		3.24 ± 0.96	3.29 ± 0.76	-0.759	0.448
Secondary discrimination		2.16 ± 0.81	2.21 ± 0.68	-0.832	0.406
Social support total		40.48 ± 7.89	34.56 ± 2.73	10.64	0.000**

Table 1 (Continued)

Item	n (%)	Mean ± SD	Norm	t	P
Objective support		8.42 ± 2.54			
Subjective support		24.47 ± 4.85			
Support utilization		7.59 ± 3.35			
Active coping		1.73 ± 0.58	1.78 ± 0.52	-1.156	0.249
Passive coping		1.18 ± 0.058	1.59 ± 0.66	-10.015	0.000**
Self-Esteem		20.52 ± 3.89	28.75 ± 4.86	-29.95	0.000**

Note: *$P < 0.05$; **$P < 0.001$

3.3. Correlation between self-esteem and stigma

In hospitalized patients with chronic HBV infection, stigma and its dimensions were positively correlated with self-esteem (r=0.175–0.341, $P < 0.05$; in **Table 2**). Self-esteem entered the multiple regression equations for the overall stigma score and the dimensions of negative self-evaluation, perceived humiliation, and secondary discrimination, with standardized partial regression coefficients of 0.201, 0.161, 0.188, and 0.160, respectively. These results confirm that stigma and its dimensions are significantly associated with self-esteem in this population (r=0.175–0.341, $P < 0.05$). Self-esteem positively correlated with overall stigma (r=0.282, $P < 0.001$) and its dimensions (negative self-evaluation: r = 0.341; perceived humiliation: r = 0.262; secondary discrimination: r=0.178; all $P < 0.05$).

Table 2. Correlation between stigma and self-esteem in chronic HBV patients (n=201)

Variable	Total stigma	External discrimination	Negative self-evaluation	Perceived humiliation	Confidential illness	Secondary discrimination
Self-esteem	0.282**	0.175*	0.341**	0.262**	0.193**	0.178*

Note: *$P < 0.05$*; **$P < 0.01$

3.4. Multivariate analysis

Using stigma and its dimensional scores as dependent variables, multivariate analysis revealed that subjective support and self-esteem were the primary influencing factors of stigma in hospitalized chronic HBV-infected patients. These two variables explained 10.7% of the variance in perceived humiliation (**Table 3**). Subjective support emerged as the main predictor of external discrimination. For negative self-evaluation, the significant factors included subjective support, self-esteem level, disease status (hepatitis B-related cirrhosis), active coping, and passive coping. Subjective support and self-esteem level influenced perceived humiliation, while subjective support and passive coping were associated with illness concealment. Self-esteem level directly affected secondary discrimination.

Table 3. Multivariate analysis of perceived humiliation dimension in chronic HBV patients (n=201)

Variable	β	SE	Standardized β	95%CI	t	P
Subjective support	-0.044	0.013	-0.241	-0.069~-0.019	-3.502	0.001
Self-esteem	0.043	0.016	0.188	0.012~0.073	2.730	0.007

Note: R=0.340, R^2=0.115, Adjusted R^2=0.107, F=12.921, $P < 0.001$

4. Pathways of self-esteem's influence on stigma

4.1. Mediating role of coping styles

This study found that active coping strategies in chronic HBV-infected patients were negatively correlated with stigma (r=-0.198, $P < 0.01$), while passive coping strategies showed a positive correlation (r=0.268, $P < 0.01$). These findings are consistent with those of Yin Cong et al. in schizophrenia patients and Lei Hua et al. in benign prostatic hyperplasia patients [11–12]. Self-esteem indirectly influenced stigma by moderating coping styles: patients with higher self-esteem tended to adopt active coping strategies (e.g., proactively seeking medical information, engaging in social support activities), thereby reducing negative self-evaluation [13]. For instance, the Simplified Coping Style Questionnaire developed by Xie Yaning demonstrated that active coping positively correlates with psychological adaptability, alleviating disease-related psychological stress [13]. Conversely, patients with lower self-esteem were more prone to passive coping (e.g., avoiding social interactions or denying the illness), intensifying the psychological need for illness concealment (β=0.207, $P < 0.01$) [12]. This divergence in coping styles may stem from cognitive biases regarding self-worth—individuals with higher self-esteem perceive the disease as a temporary challenge, whereas those with lower self-esteem view it as a negation of their self-value, thereby reinforcing stigma [11].

4.2. Interaction between self-esteem and perceived social support

Subjective support, as a core dimension of social support (β = -0.294, $P < 0.001$), exerts its effects through moderation by self-esteem levels [14]. Xiao Shuiyuan emphasized that subjective support reflects an individual's emotional experience of social support, where individuals with higher self-esteem are more likely to perceive respect and support from others, thereby mitigating the negative impact of stigma [14]. For instance, Wang Ting's study on chronic hepatitis B patients demonstrated that higher social support levels correlate with lower stigma, particularly in the negative self-evaluation dimension (r = -0.397, $P < 0.01$) [15]. Patients with low self-esteem may exhibit a "support perception bias", interpreting objective support as pity rather than genuine respect, which diminishes the efficacy of subjective support [16]. Dong Fengyun et al. confirmed in schizophrenia patients that self-esteem positively correlates with perceived subjective support (r = 0.321, $P < 0.01$), indirectly influencing stigma formation [16]. Additionally, in this study, subjective support entered the regression equations for external discrimination (β = -0.298, $P < 0.001$) and illness concealment (β = -0.260, $P < 0.001$), suggesting that individuals with higher self-esteem reduce sensitivity to external discrimination and concealment motivations through enhanced perception of social support [14, 17].

4.3. Disease cognition and self-esteem

Disease status, such as hepatitis B-related cirrhosis, significantly influences stigma (β = 0.169, $P = 0.010$), with self-esteem level acting as a moderator in this process [1]. Patients with cirrhosis often experience self-image devaluation due to severe symptoms, physical changes (e.g., jaundice, ascites), and impaired social

functioning [1]. Those with higher self-esteem may maintain self-worth by reframing disease meaning (e.g., "active treatment can control the condition"), whereas individuals with lower self-esteem are more likely to adopt negative cognitions (e.g., "illness equals failure"), exacerbating negative self-evaluation ($\beta = 0.161$, $P = 0.025$) [15, 18]. Liu Yulian et al. demonstrated in mood disorder patients that lower self-esteem intensifies self-denial caused by disease, aligning with this study's finding that "self-esteem entered the regression equation for the negative self-evaluation dimension" [18]. Furthermore, secondary discrimination is directly influenced by self-esteem ($\beta = 0.160$, $P = 0.023$), potentially because individuals with higher self-esteem are more sensitive to societal evaluations—they prioritize the potential impact of the disease on occupational and familial roles, thereby amplifying perceived secondary discrimination [17, 19].

5. Conclusion

This study, which investigated 201 hospitalized patients with chronic HBV infection, confirmed that self-esteem levels have a significant impact on the stigma experienced by patients with chronic hepatitis B. Self-esteem was positively correlated with overall stigma and its various dimensions, emerging as a critical factor influencing multiple aspects of stigma. Self-esteem indirectly affects stigma through mediating pathways that involve patients' coping styles, perceived social support, and cognitive appraisal of their disease status, forming a complex influence mechanism.

Based on these findings, clinical care and social support systems should prioritize enhancing the self-esteem of chronic hepatitis B patients. Healthcare professionals can improve patients' self-esteem by providing health education and psychological counseling to foster accurate perceptions of the disease and a positive self-identity. Furthermore, encouraging patients to adopt proactive coping strategies and enhancing their utilization of social support can effectively reduce stigma, thereby improving quality of life and treatment adherence. Future research should expand sample sizes and utilize longitudinal designs to explore the dynamic relationship between self-esteem and stigma, providing a stronger foundation for developing precise and effective interventions.

Disclosure statement

The authors declare no conflict of interest.

References

[1]   Chinese Society of Hepatology, 2015, Guidelines for the Prevention and Treatment of Chronic Hepatitis B (2015 update). Chinese Journal of Hepatology, 33(12): 321–340.

[2]   Guo Y, Jin X, Li J, et al., 2015, An Epidemiological Serosurvey of Hepatitis B Virus Shows Evidence of Declining Prevalence due to Hepatitis B Vaccination in Central China. International Journal of Infectious Diseases, 40(C): 75–80.

[3]   Vaage J, Agarwal, 2015, Estimations of Worldwide Prevalence of Chronic Hepatitis B Virus Infection: A Systematic Review of Data Published between 1965 and 2013. Lancet, 386(10003): 1546–1555.

[4]   Goffman E, 1969, Stigma: Notes on the Management of Spoiled Identity. American Journal of Sociology, 45(527): 642.

[5]   Yu H, Wang LN, Zhou YQ, et al., 2015, The Impact of Stigma on Quality of Life in Schizophrenia Patients during Recovery: Mediating Effects of Social Support and Coping Styles. Chinese Nursing Management, 15(4): 424–428.

[6]   Wang T, Lu PJ, Zhao HD, et al., 2016, Research Progress on Stigma in Hepatitis C Patients. Journal of Nursing of the People's Liberation Army, 33(16): 43–45.

[7]   Li L, Liu LJ, 2017, Bibliometric Analysis of Stigma-Related Literature Based on GoPubMed. Chinese Mental Health Journal, 31(11): 857–861.

[8]   Yu LJ, Liu HY, Zheng J, et al., 2015, Discrimination Status and Influencing Factors of Hepatitis B among Rural Adults in Three Eastern Provinces of China. Chinese Journal of Preventive Medicine, 49(9): 771–776.

[9]   Huang J, Guan ML, Balch J, et al., 2016, Survey of Hepatitis B Knowledge and Stigma among Chronically Infected Patients and Uninfected Persons in Beijing, China. Liver International, 36(11): 1595–1603.

[10] Luo D, Lin Z, Bian QG, et al., 2018, Current Status of Perceived Stigma and Its Impact on Quality of Life, Medication Adherence, and Psychological State in Inflammatory Bowel Disease Patients. Chinese Journal of Nursing, 53(9): 1078–1083.

[11] Yin C, Zhang SF, Yang BX, 2018, Analysis of Stigma Status and Related Factors in Schizophrenia Patients. Neural Injury and Functional Reconstruction, 13(6): 276–278.

[12] Lei H, Li LS, Yang M, et al., 2018, Correlation Between Stigma and Coping Styles in Patients with Benign Prostatic Hyperplasia. Modern Clinical Nursing, 17(12): 7–11.

[13] Xie YN, 1998, Preliminary Study on the Reliability and Validity of the Simplified Coping Style Questionnaire. Chinese Journal of Clinical Psychology, 6(2): 114–115.

[14] Xiao SY, 1994, Theoretical Basis and Research Application of the Social Support Rating Scale. Journal of Clinical Psychiatry, 4(2): 98–100.

[15] Wang T, 2017, Current Status of Stigma and Its Correlation with Social Support and Self-Esteem in Chronic Hepatitis B Virus Carriers, thesis, Jilin University.

[16] Dong FY, Zhao SY, Sun HY, et al., 2017, Correlation Analysis of Stigma with Self-Esteem and Social Support in Schizophrenia Patients. Journal of Qilu Nursing, 23(15): 51–53.

[17] Feng LF, Xie JQ, Zou X, et al., 2012, Preliminary Study on the Reliability and Validity of the Stigma Scale for Chronic Hepatitis B Virus Carriers. Chinese Journal of Behavioral Medicine and Brain Science, 21(4): 370–372.

[18] Liu YL, Yao XY, Zhang HC, 2010, Correlation Between Stigma and Self-Esteem in Patients with Mood Disorders. Journal of Nursing Management, 10(12): 839–841.

[19] Greenwald AG, Banaji MR, 1995, Implicit Social Cognition: Attitudes, Self-Esteem, and Stereotypes. Psychological Review, 102(1): 4–27.