Original Article

Resilience and Health-Related Quality of Life among Hepatitis C Patients in Pahang, Malaysia

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Abstract:

Background: Hepatitis C is one of the most common causes of liver disease worldwide. Health impacts of hepatitis C are not limited to physical morbidity but include psychosocial dimensions such as quality of life (QOL), depression, anxiety, and stigmatization. In Malaysia, modifiable factors that can improve QOL among hepatitis C patients have not been adequately studied. Resilience – defined as the capacity to endure hardships and rebound from life adversities – is associated with mental health and well-being. Our study aims to test the association between resilience and QOL among hepatitis C patients. ***Methods:*** Employing a cross-sectional design, 195 hepatitis C patients who attended Hospital Tengku Ampuan Afzan (HTAA) – the main public tertiary hospital in Pahang – were recruited through convenience sampling. Resilience was assessed using the Connor-Davidson resilience scale while Health-Related Quality of Life (HRQOL) was measured by 36-item short-form survey (SF-36v2)**.** Multiple linear regression was run to determine the association between resilience and HRQOL. ***Results:*** We found significant associations between resilience and the physical (b=0.35; 95% CI: 0.11, 0.30; p<0.001) and mental dimension of HRQOL (b=0.47; 95% CI: 0.21, 0.42; p<0.001). Patients with higher resilience scores were more likely to have better HRQOL compared to those less resilient. ***Conclusion:*** Resilience may be a protective factor in the disease trajectory of hepatitis C in terms of QOL. Health care providers should incorporate resilience into the management of hepatitis patients, through a multidisciplinary approach.

Keywords: *Resilience; Health-Related Quality of Life (HRQOL); Hepatitis C; Malaysia*

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Introduction

Hepatitis C is one of the most common causes of liver disease worldwide. Close to 400,000 adults or 1.5%-2.0% of the population in Malaysia had hepatitis C in 2013, with a total of 80–150 million people living with the chronic condition worldwide[1]. At the global scale, deaths related to hepatitis C were reported to have reached 700,000 in 2013[2]. The prevalence of Hepatitis C in Malaysia was stated at 1.3%, higher than other Southeast Asian countries like Indonesia (0.5%) and the Philippines (0.6%), [3,4] In 2009, an estimated 453,700 HCV-infected people lived in Malaysia in – comprising 2.5 per cent of the population aged 15 to 64 years – with 59% infected through needle sharing due to drug abuse.[5]

Hepatitis C infected individuals are at risk of developing advanced liver disease. Approximately 60-70% of chronically infected persons eventually develop chronic liver disease, 5-20% develop cirrhosis, and 1-5% die due to cirrhosis or hepatocellular carcinoma[6]. Other than physical health, evidence shows that hepatitis C adversely affects individuals' mental health and well-being as a consequence of the disease course itself and the stigma attached to it. Hepatitis C patients have been reported to experience anxiety, depression and irritability [7,8] – leading to decline in QOL.

Health-Related Quality of Life (HRQOL) is defined as a patient's subjective perception of the impact of their disease and its treatment on their daily life, and

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their physical, psychological and social functioning.[9] HRQOL is a multi-dimensional concept that comprises physical, mental, and social domains. Studies have demonstrated the negative impact of hepatitis C on HRQOL, but little is known about the Malaysian context. [10–13] Similarly, modifiable factors that can contribute to HRQOL improvement – specifically in the Malaysian socio-cultural setting – among hepatitis C patients have not been extensively studied.

On the other hand, resilience can be defined as a construct that concerns an individual's capacity to respond positively to the adverse situations he or she faces, even when these pose a potential risk to health.[14,15] Individuals who possess resilience traits are said to be able to 'bounce back' faster after being struck by a life calamity, and adapt easier to challenges other people find difficult to cope with. Such 'calamity' or 'challenge' includes diagnosis with chronic diseases or preserving self-esteem when facing possible stigmatization. Prior studies showed that resilience can be taught and improved through different interventions such as counselling, workplace activities, and specifically-designed programs.[16] This study aims to examine the association between resilience and HRQOL among hepatitis C patients in HTAA, Pahang.

Materials and Methods

Design and study population

This was a cross-sectional study conducted from April 2019 to August 2019 at Hospital Tengku Ampuan Afzan (HTAA) which is located in Pahang capital city, Kuantan. Respondents were recruited through convenience sampling based on the following inclusion criteria: a) aged 18 years or older; b) diagnosed with hepatitis C using serological test, and; c) attended gastroenterology clinic or was admitted to medical ward in HTAA. Patients with overt encephalopathy (grade II or more) and those proved or suspected to have hepatocellular carcinoma (based on ultrasounds, CT scan and/or alpha-fetoprotein levels) were excluded. Convenience sampling method was used given logistics issues such as time and manpower constraint.

Sample size determination

Sample size was calculated using the "50+8m" formula proposed by Tabachnick and Fidell where "m" is the number of factor for multiple linear regressions [17]. For this study, a minimum sample of 154 was required, assuming two dependent variables and 11 covariates. With 20% inflation, the sample size needed was 185. There were altogether 195 participants who joined this study.

Tools and measurements

Data collection was performed using a structured self-administered questionnaire which was given to respondents during their clinic visits. The questionnaire was available in Bahasa (Malay) and English languages. The researcher directly approached the potential respondents and invited them to join the study. Upon agreement, each respondent received a thorough explanation about the study and had their written consent taken.

The questionnaire entailed the following sections: a) questions on socio-demographics, treatment status and clinical status; b) the SF-36v2 scale to measure HRQOL; c) Connor-Davidson Resilience scale (CD-RISC), and; d) other potential confounders such as comorbidities and social support. Social support was assessed using the Duke Social Support Index (DSSI).

Demographic characteristics included age, gender, marital status, employment, monthly income, educational level, comorbidity, cirrhotic status and treatment status. Marital status was categorized into 'married/ living with partner' or 'single' (including divorced, widowed or separated). Educational level assessed the highest education attained by the respondent. Monthly income was initially categorised into seven groups: <RM499, RM500-RM999, RM1000-RM1499, RM1500-RM1999, RM2000-RM2499, RM2500-RM2999 or >RM3000. Subsequently, it was collapsed into: a) B40 < RM3000, and; b) M40 + T20 > RM 3000.[18] This classification was based on income groups in Malaysia, where B40 represents the bottom 40% of income earners, M40 the middle 40% and T20 the top 20%. Comorbidity was categorized into 'yes' (having any other chronic illness) or 'no'. Treatment status was classified into 'treatment-naïve', 'on treatment' and 'completed treatment'. Cirrhotic status was categorized into 'yes' (cirrhotic) or 'no' (not cirrhotic). Cirrhosis was defined as advanced stage of liver disease characterized by extensive hepatic fibrosis, nodularity of liver, alteration of liver architecture and disrupted hepatic circulation.[6]

For HRQOL, the Optum™ SF-36v2® Health Survey entails 36 questions in order to measure functional

health and well-being [19]. The validated Medical Outcomes Study 36-item Short-Form Health Survey (SF-36v2) in English (IQOLA SF-36v2 Standard, (English)) and Malay version (IQOLA SF-36v2 Standard, Malaysia (Malay)) were used in this study. The Malay version of SF-36v2 was validated before, with a Cronbach's alpha over 0.70 for all scales except for social functioning. [20] The SF-36v2 covers eight domains of HRQOL: physical functioning (PF, 10 items), role physical (RP, 4 items), role-emotion (RE, 3 items), bodily pain (BP, 2 items), vitality (VT, 4 items), social functioning (SF, 2 items), general health (GH, 5 items) and mental health (MH, 5 items). These eight domains were then summarized into physical component summary (PCS) and mental component summary (MCS). Both components were summed and transformed to a 0 to 100 scale using specific QualityMetric Health Outcomes™ Scoring Software 4.0, with higher scores indicating better health status. [21]

The Connor-Davidson Resilience Scale (CD-RISC25) has been previously tested in clinical and community samples. In the latter, its alpha coefficient was 0.89 and intraclass correlation coefficients (ICC), 0.87. [22] The validated Malay and English version of CD-RISC25 was used in this study. [23] Prior empirical studies have utilized CD-RISC2 among end-stage liver disease patients with myriad causes including hepatitis C. [24] The scale gives a score ranging from 0 to 100, with higher scores indicating higher resilience.

The Duke Social Support Index (DSSI) has 11 items that measure social support received by an individual. The higher the score, the greater the support perceived. There are two subscales: social interaction and subjective support. The social interaction sub-scale is calculated as the sum of re-coded scores for items 1 to 4; the sub-scale ranges from 4 to 12 with higher scores indicating more social interaction. The subjective support sub-scale is calculated as the sum of codes for items 5 to 11; the subscale ranges from 7 to 21 with higher scores indicating more social support. [25]

Analytical Approach

Statistical analyses were performed using the SPSS 21.0 for Windows. Continuous data were reported in means and standard deviations (SD) while categorical data were reported in frequency and percentages. Ethnicity and religion were excluded from bivariate and multivariate analyses as over 90% of the sample fit a Malay Muslim profile. With regards to continuous data, differences between two groups were tested by independent sample t-tests and differences between three groups or more were tested using one-way ANOVA. Association between resilience and HRQOL – while controlling for other confounders – was analyzed using multiple linear regression. Assumptions of linear regressions were tested prior to running the tests.

Ethical Approval

Ethical approval was obtained from the National Medical Research Register (NMRR), Malaysia Research Ethics Committee (MREC) and the Clinical Research Centre (CRC) of HTAA (Ethics No: NMRR-18-3536-42688)

Results

From all who were invited, 195 respondents agreed to join the study, giving a response rate of 97.5%. Age of participants ranged between 21 and 76 years. Characteristics of study subjects are shown in Table 1.

Table 1: Basic characteristics of study respondents

Variables	N	
All patients	**195**	**(100%)**
Age, mean ± SD	195	45.6 ± 9.7
Sex		
Male	162	83.1%
Female	33	16.9%
Marital Status		
Married/ Living with partner	122	62.6%
Single	73	37.4%
Employment Status		
Employed	135	69.2%
Unemployed	60	30.8%
Income		
B40 (<RM3000)	165	84.6%
M40 + T20 (>RM3000)	30	15.4%
Education Level		
No formal education	1	0.5%
Primary education	37	19%
Secondary education	136	69.7%
Tertiary education	21	21%
Comorbidity		
Yes	95	48.7%
No	100	51.3%
Cirrhosis Status		
Cirrhosis	43	22.1%
Non Cirrhosis	152	77.9%
Treatment Status		
Treatment naive	104	53.3%
On Treatment	44	22.6%
Completed Treatment	47	24.1%

Mean score of PCS and MCS (HRQOL), CD RISC 25 (resilience) and DSSI (social support).

For HRQOL, the mean score for PCS and MCS were 48.8 ± 7.9 (range 0-100) and 47.7 ± 9.1 (range 0-100) respectively. Mean score for resilience (CD RISC 25) was 73.3 ± 13.7 (range 0-100), while for social support (DSSI) it was 24.5 ± 13.7 (range 11-33).

Multivariable analysis for PCS

Multiple linear regression was run to test the association between PCS and resilience while controlling for other factors i.e. age, gender, marital status, income, education level, employment status comorbidities, treatment status, cirrhotic status and social support. Only one variable, resilience (CD RISC 25) was significantly associated with the PCS component of HRQOL (β = 0.35, p < 0.05).

Table 3: Results of multiple linear regression analyses with resilience as independent variable and HRQOL (PCS) as outcome

PCS	*B*	95% CI		*SE B*	β
		LL	*UL*		
Gender	1.66	-1.44	4.75	1.57	0.79
Marital Status	-0.61	-3.07	1.84	1.25	-0.38
Employment Status	-1.18	-3.76	1.41	1.31	-0.69
Income Range	0.72	-2.36	3.80	1.56	0.03
Cirrhotic Status	1.68	-1.10	4.46	1.41	0.09
Comorbid	2.10	-0.07	4.28	1.10	0.13
Age	-0.15	-0.14	0.11	0.06	-0.02
Resilience (CD RISC 25)	0.20***	0.11	0.30	0.05	0.35***
Social Support (DSSI)	0.04	-0.26	0.33	0.01	0.02
Treatment Status	-0.04	-2.32	2.24	1.15	-0.003
Education Level	-1.38	-4.17	1.41	1.42	-0.07

B = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient

*p <.05. **p < .01. ***p< .001

Multivariable analysis for MCS

Multiple linear regression was run to test the association between MCS and resilience (CD RISC 25) while controlling for similar confounders as before. Only one variable, resilience (CD RISC 25) was significantly associated with the MCS component of HRQOL (β=0.47 p < 0.05).

Table 4: Results of multiple linear regression analyses with resilience as independent variable and HRQOL (MCS) as outcome

MCS	*B*	95% CI for *B*		*SE*	β
		LL	*UL*		
Gender	0.17	-3.18	3.52	1.70	0.01
Marital Status	0.52	-2.14	3.19	1.35	0.03
Employment Status	0.81	-1.99	3.61	1.42	0.04
Income Range	0.66	-2.68	4.0	1.69	0.03
Cirrhotic Status	1.46	-1.56	4.47	1.53	0.07
Comorbid	0.53	-1.82	2.89	1.19	0.03
Age	0.03	-0.10	0.17	0.07	0.04
Resilience (CD RISC 25)	0.31***	0.21	0.42	0.05	0.47***
Social Support (DSSI)	0.15	-.17	0.47	0.16	0.08
Treatment Status	-0.08	-2.55	2.40	1.25	-.004
Education Level	-1.48	-4.51	1.55	1.54	-0.07

B = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient

*p <.05. **p < .01. ***p< .001

Discussion

Our findings showed that respondents' PCS and MCS scores were lower compared to normal population.[26] This indicates the possible adverse impact of hepatitis C on HRQOL. This was consistent with prior evidence; studies in Brazil and China reported that hepatitis C patients had poorer scores in all SF-36 domains than local population.[12] This HRQOL disparity can be attributed to various factors including the chronic nature of hepatitis C, the need for treatment, various disease complications which may exhaust patients and the societal stigma attached to it.

Resilience was found to be significantly associated with both HRQOL components. Respondents with higher resilience scores had better PCS and MCS scores compared to those with lower resilience scores. This was again consistent with prior research findings where resilience was found to have a positive influence on QOL and self-care among chronic disease patients. [15,27,28] In other studies, rheumatoid arthritis patients who scored higher on resilience were less likely to experience depression[29] while diabetes patients with higher resilience reported better glycaemic control. [30] Similarly, resilience scale correlated with fewer disabilities and better QOL

among patients with Parkinson's disease. [31]

A number of explanations on the relationship between resilience and HRQOL can be offered here. First, resilience improves coping responses to pain and facilitates partial or full recovery, through promoting positive emotions. Resilient individuals have greater emotional intelligence and self-awareness to assess their condition, therefore aiming to strengthen their own positive influence as a way of minimising the control that their current emotional pain has.[32] Simultaneously, resilience dampens negative emotions and motivates an individual to adopt a more optimistic lifestyle and approach; this may have resulted in less serious immune system inflammatory responses and lower levels of cortisol secretion. [32]

Our findings highlight a number of clinical implications First, it is important that hepatitis C patients receive regular and standard assessment of their psychosocial well-being, including HRQOL. This is to enable detection of those whose QOL are severely compromised by the disease but do not explicitly complain to the physician, for various reasons. Second, clinicians managing hepatitis C patients should take into account HRQOL – or other aspects of mental health – and resilience-enhancing components into their management plan. This can be done through collaboration with psychologists or psychiatrists or counsellors who can carefully design interventions to boost one's resilience in the face of serious diseases like hepatitis C. Ideally, a multi-disciplinary approach is needed to ensure a more holistic disease management, while also considering other documented psychosocial effects of hepatitis C such as depression, anxiety, fear of stigma and perceived discrimination. [7,33,34]

Our study has several limitations. Convenience sampling is susceptible to selection bias; this technique was employed in light of time and logistic constraints. Second, our respondents were derived from one hospital, consisting of mostly Malays. Other ethnic groups were under-represented. Third, the cross-sectional design does not imply cause and effect relationship. So we could not ascertain if resilience actually leads to higher QOL, or respondents with higher QOL were already more resilient, to begin with.

Conclusion

Resilience is a significant factor that can influence HRQOL among Hepatitis C patients. Respondents with higher resilience demonstrated better scores for PCS and MCS components of HRQOL, which may in turn result in better treatment outcomes. Interventions that can promote resilience should be incorporated into the clinical management of hepatitis C patients.

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Author Contribution:

Idea owner of this study: UAZ, RMY

Study design: UAZ, RMY, KAJ, MAMJ

Data gathering: UAZ

Writing and submitting manuscript: UAZ, RMY

Editing and approval of final draft: UAZ, RMY

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