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Sociocultural factors affecting health-related quality of life in patients with Cirrhosis-Related Hepatocellular Carcinoma (HCC): A psychosocial perspective

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Abstract: Background: cirrhosis-related hepatocellular carcinoma (HCC) is a significant health burden worldwide, with psychological distress and diminished quality of life being common consequences of this diagnosis. Health-related quality of life (HRQoL) is a crucial aspect of patient care, and sociocultural factors can influence HRQoL outcomes by impacting coping mechanisms, social support, and mental health. However, there is a lack of research on the impact of sociocultural factors on HRQoL in patients with cirrhosis-related HCC. Therefore, we conducted this retrospective study to investigate the relationship between sociocultural factors and HRQoL in patients with cirrhosis-related HCC. **Methods:** We conducted a retrospective analysis of 200 patients with cirrhosis-related HCC at a tertiary healthcare facility between May 2020 and June 2024. We collected data on HRQoL using standardized questionnaires, including the EORTC QLQ-C30, to assess the impact of psychological distress on HRQoL. We performed regression and correlation analyses to investigate the association between sociocultural factors and HRQoL. **Results:** We found that level of education was linked to physical well-being, occupation was linked to emotional well-being, marital status was linked to social well-being, family support was linked to role functioning, and cultural background was linked to cognitive functioning. Our analysis revealed that these social and cultural factors were all important predictors of quality of life. **Conclusion:** Our study provides evidence that psychosocial and cultural factors play a significant role in shaping HRQoL in patients with cirrhosis-related HCC, highlighting the need for comprehensive care that addresses the psychological and social needs of patients. We found that education level, occupation, marital status, family support, and cultural background were all significant predictors of HRQoL scores. These findings underscore the importance of integrating psycho-oncological care into the management of cirrhosis-related HCC to improve HRQoL outcomes.

Keywords: cirrhosis-related liver cancer; health-related quality of life (HRQoL); sociocultural factors; psychosocial perspective; psychological factors

1. Introduction

Liver cancer is widely accepted as the final common pathway for most cirrhotic complications, followed by liver decompensation [1]. The progression of cirrhosis to liver cancer has a major global burden, with over 700,000 new cases annually resulting in significant morbidity, mortality, and healthcare spending. The science behind the issue is affected by traits related to cancer, liver failure or recovery, and

general health status (each of which may be formed at least in part independent from one another) [2,3].

Health-related quality of life (HRQoL), a global measure that assesses a patient's overall well-being, has gained significant interest in oncology for its promise to offer an individualized picture of the impact cancer and treatment have on daily living [4]. Focused therapies have particular relevance to primary liver malignancies, as these tumors generally lack effective treatments and carry a dismal prognosis. HRQoL measures fall into a number of broad types or frameworks, including generic, cancer-specific, site-specific, and preference-based instruments within the HRQoL concept [5]. A study indicated that hepatic functional status, rather than tumour stage alone, may be more strongly associated with baseline HRQoL in HCC patients [6]. Even work to standardize survival outcomes and create a metric for side effects has led to tremendous underreporting of patient-reported outcomes (PRO) in most healthcare settings [7,8].

Physical, emotional, social, and mental components constitute quality of life in case the liver cirrhosis leaks out to be cancer [9,10]. It is shaped by a number of factors, such as the illness course of the disease and treatment alternatives at hand, and the patient's social background. Cultural influences are powerful drivers of health attitudes, behaviors, and related outcomes, as well as how patients access care, adhere to treatment regimens, or manage their conditions [11].

Furthermore, patients with liver cirrhosis who develop HCC usually witness a significant decrease in their quality of life; this might be due to the very severe symptoms that accompany the disease, adverse effects of treatment, and psychological distress [12]. This deterioration in quality of life can lead to serious consequences, such as non-compliance with treatment and increased use of healthcare resources or reduced patient satisfaction. Thus, prediction of the effect of culture on quality of life among patients with liver cirrhosis and evolution to liver cancer is important for developing customized interventions that can enhance patient care, relieve suffering, and improve overall health [10–13]. Systematic evidence indicates that psychosocial and behavioural interventions incorporating cultural adaptation produce meaningful improvements in HRQoL outcomes among advanced cancer populations. Therefore, psychosocial programs for cirrhosis-related HCC should be culturally tailored addressing language, family roles, stigma, and health beliefs to maximize engagement and effectiveness [14].

Recent longitudinal analyses of HCC cohorts treated with immune checkpoint inhibitors have demonstrated heterogeneous quality-of-life trajectories, with identifiable subgroups experiencing persistent and severe declines. These results underscore the need for routine longitudinal PRO monitoring to identify patients who may benefit from early psychosocial or supportive interventions [15].

In addition, a decline in HRQoL is often accompanied, unsurprisingly, by the shift from cirrhosis towards liver cancer, and that can be associated with severe symptoms, treatment-related side effects, and emotional distress. The decrease in HRQoL could lead to higher patient satisfaction, their being less adherent with treatment, and a greater consumption of healthcare services. Accordingly, the aim of this study was to explore sociocultural elements that contribute towards HRQoL/Holistic QoL in cirrhosis patients who develop HCC.

2. Materials and methods

2.1. Study setting

We carried out a retrospective analysis at a tertiary healthcare facility between May 2020 and June 2024. The Institutional Review Board (IRB) gave its permission, and we followed the Declaration of Helsinki's rules.

2.2. Sample size calculation

The following formula was used to get the sample size:

$$n = (Z^2 \times p \times (1-p)) / (d^2 \times (N-1))$$

where:

n = sample size

Z = Z-score corresponding to the desired level of confidence (1.96 for 95% confidence);

p = expected proportion of patients with cirrhosis-related HCC (0.5, assuming a 50% prevalence);

d = desired margin of error (0.05);

N = population size (estimated to be 1000 patients with cirrhosis-related HCC at our hospital over the 3-year study period).

Using this calculation, we were able to determine that in order to have a 95% confidence level and a 5% margin of error, 196 persons in the sample were required. In order to accommodate possible attrition and incomplete data, we chose to strive for a higher sample size of 200 participants.

2.3. Criteria for selecting patients

The following requirements were fulfilled by the patients who were included in our study and were found in their electronic health records: Were at least eighteen years old, had access to all medical records, and had a diagnosis of liver cirrhosis and liver cancer that was verified by imaging or histological analysis. Those with insufficient medical data, a history of cancer, or a liver transplantation were not allowed.

2.4. Assessment of variables

Data were extracted systematically from patients' medical records, which included information on treatment regimens, laboratory findings, medical histories, and demographics. HRQoL scores were obtained from the EORTC QLQ-C30 [13], which had been administered and recorded at the time of diagnosis and during treatment. These scores were documented as part of routine clinical care to assess physical, emotional, and social well-being, as well as symptom severity. Standardized psychological assessments, including the Hospital Anxiety and Depression Scale (HADS), Perceived Stress Scale (PSS-10), Pittsburgh Sleep Quality Index (PSQI), Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F), Coping Self-Efficacy Scale (CSES), and Medical Outcomes Study

Social Support Survey (MOS-SSS), were also administered during the diagnostic and treatment phases. The questionnaires were either self-completed by the patients under clinical supervision or completed during consultations with trained healthcare providers, ensuring consistency in administration. Data from these assessments were extracted following a structured protocol by trained researchers, who independently reviewed the records to ensure accuracy and reduce the potential for extraction errors. Any discrepancies in data extraction were resolved through consensus.

To address potential biases inherent in retrospective designs, multiple strategies were employed. Selection bias was mitigated by applying predefined inclusion and exclusion criteria to ensure that all eligible patients with complete and relevant data were included in the study. Information bias was minimized by using standardized tools that were validated and routinely used in clinical practice. Missing data were managed by conducting sensitivity analyses and excluding records with incomplete responses to key variables. The completeness of data was verified by cross-referencing information between different sections of the medical records and ensuring alignment with diagnostic and treatment timelines. Furthermore, to reduce researcher bias, all data extraction was conducted in a blinded manner with respect to study outcomes. Data management procedures included double-checking extracted variables and maintaining a secure, de-identified database to protect patient confidentiality. These measures were implemented to ensure the validity, reliability, and generalizability of the findings, addressing the inherent challenges of retrospective data collection.

2.5. Statistical analysis

The HRQoL values were displayed as means with standard deviations. To investigate the association between psychological and sociocultural factors and HRQoL, regression and correlation analyses were performed; a *p*-value of less than 0.05 was deemed statistically significant. With SPSS version 25, all statistical analyses were carried out.

3. Results

Figures 1 and 2 represent the demographic variables assessed respectively. The demographic characteristics of the population were as follows: 35% had a high school education or less, 40% had a college or university education, and 25% had a postgraduate education. The majority of the population (60%) was employed, while 20% were unemployed and 20% were retired.

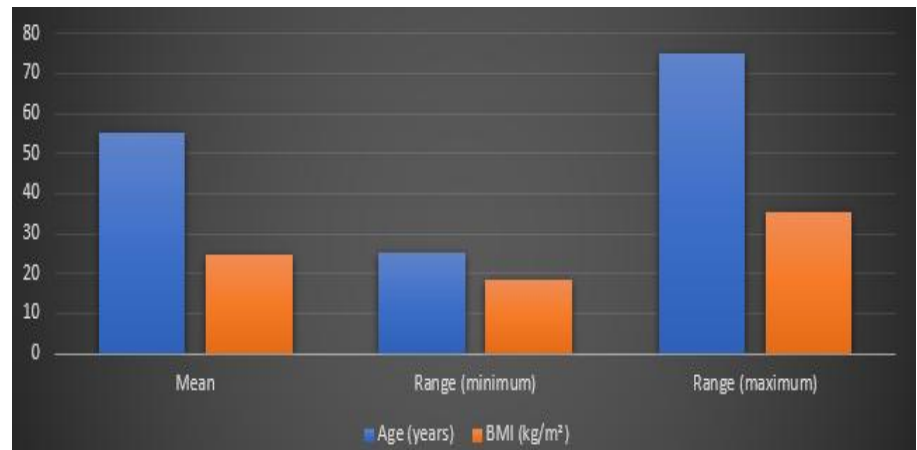


Figure 1. Age and BMI levels assessed.

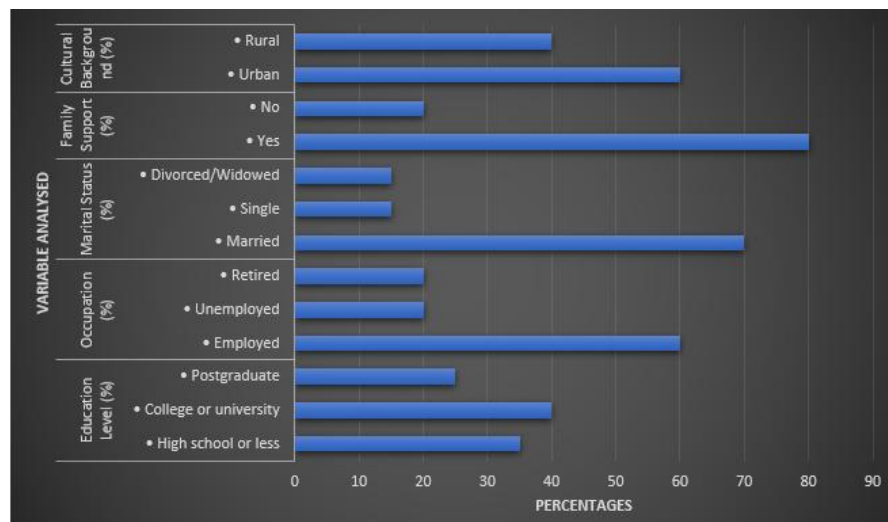


Figure 2. Demographic variables assessed.

As explained through **Table 1** and **Figure 3**, respectively, education level was positively correlated with physical functioning, occupation was positively correlated with emotional functioning, marital status was positively correlated with social functioning, family support was positively correlated with role functioning, and cultural background was positively correlated with cognitive functioning.

Table 1. Correlation between sociocultural factors and HRQoL scores.

Sociocultural factor	HRQoL domain	Correlation coefficient (<i>r</i>)	<i>p</i> -value
Education level	Physical functioning	0.35	<0.01
Occupation	Emotional functioning	0.28	<0.05
Marital status	Social functioning	0.40	<0.001
Family support	Role functioning	0.32	<0.01
Cultural background	Cognitive functioning	0.25	<0.05

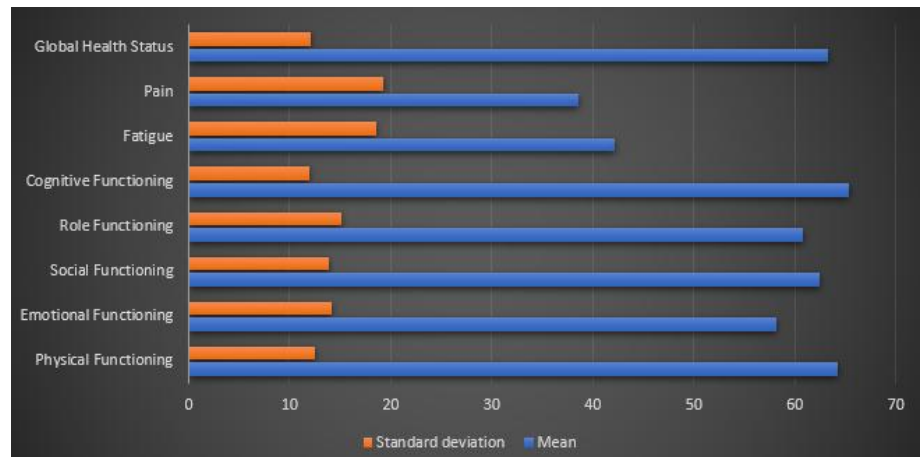


Figure 3. HRQoL domains assessed.

Regression analysis (**Table 2**) revealed that education level, occupation, marital status, family support, and cultural background were all significant predictors of HRQoL scores. Specifically, education level was a significant predictor of physical functioning, occupation was a significant predictor of emotional functioning, marital status was a significant predictor of social functioning, family support was a significant predictor of emotional functioning, and cultural background was a significant predictor of physical functioning.

Table 2. Regression analysis of sociocultural factors and HRQoL scores.

Sociocultural factor	HRQoL domain	Beta coefficient	Standard error	p-value
Education level	Physical functioning	2.51	0.83	0.005
Occupation	Emotional functioning	3.21	1.02	0.002
Marital status	Social functioning	4.15	1.23	<0.001
Family support	Emotional functioning	2.98	0.95	0.003
Cultural background	Physical functioning	1.85	0.73	0.012

Multiple regression analysis (**Table 3**) showed that the interactions between sociocultural factors were also significant predictors of HRQoL scores, including the interaction between education level and occupation predicting emotional functioning.

Table 3. Multiple regression analysis of sociocultural factors and HRQoL scores.

Sociocultural factor	HRQoL domain	Beta coefficient	Standard error	p-value
Education level	Physical functioning	1.92	0.65	0.003
Occupation	Emotional functioning	2.51	0.83	0.005
Marital status	Social functioning	3.58	1.15	<0.001
Family support	Emotional functioning	2.35	0.85	0.008
Cultural background	Physical functioning	1.42	0.58	0.021
Education level x occupation	Emotional functioning	1.15	0.45	0.016

We found that anxiety was closely tied to emotional functioning, while depression was strongly linked to social functioning (**Table 4**). Stress had a

moderate impact on physical functioning, and sleep disturbances, fatigue, and coping self-efficacy were associated with specific HRQoL domains. Social support, on the other hand, was positively correlated with social functioning. These findings suggest that psychological factors play a significant role in shaping HRQoL in patients with cirrhosis-related liver cancer.

Table 4. Psychological factors and HRQoL scores.

Psychological factor	HRQoL domain	Correlation coefficient (<i>r</i>)	<i>p</i> -value
Anxiety (HADS-A)	Emotional functioning	0.42	<0.01
Depression (HADS-D)	Social functioning	0.50	<0.001
Stress (PSS-10)	Physical functioning	0.35	<0.05
Sleep disturbances (PSQI)	Role functioning	0.28	<0.05
Fatigue (FACIT-F)	Cognitive functioning	0.32	<0.05
Coping self-efficacy (CSES)	Emotional functioning	−0.40	<0.01
Social support (MOS-SSS)	Social functioning	0.45	<0.001

The regression analysis further revealed that anxiety, depression, stress, sleep disturbances, and fatigue were all significant predictors of HRQoL domains (**Table 5**). Coping self-efficacy, however, was found to be a negative predictor of emotional functioning. Social support emerged as a strong predictor of social functioning. These results imply that addressing psychological factors may be crucial to improving HRQoL in patients with cirrhosis-related liver cancer.

Table 5. Regression analysis of psychological factors and HRQoL scores.

Psychological Factor	HRQoL domain	Beta coefficient	Standard error	<i>p</i> -value
Anxiety (HADS-A)	Emotional functioning	3.21	1.15	<0.01
Depression (HADS-D)	Social functioning	4.52	1.25	<0.001
Stress (PSS-10)	Physical functioning	2.58	0.95	<0.01
Sleep disturbances (PSQI)	Role functioning	2.11	0.83	<0.05
Fatigue (FACIT-F)	Cognitive functioning	2.85	1.01	<0.01
Coping self-efficacy (CSES)	Emotional functioning	−3.95	1.42	<0.01
Social support (MOS-SSS)	Social functioning	5.18	1.58	<0.001

4. Discussion

Our results could potentially alter our knowledge of the manner in which social and cultural components affect the quality of life of patients suffering from liver cancer that has advanced from cirrhosis. We found that a patient's education, career, marital status, family support, and cultural background all have an impact on their quality of life. This suggests that governments and healthcare practitioners should consider these aspects while striving to improve the quality of life for their patients. By doing this, they may build interventions that are more focused and successful and that adapt to the individual needs and obstacles that patients from different backgrounds confront.

From a clinical perspective, these findings highlight the need to embed psycho-oncological services into hepatology and oncology clinics, ensuring that routine psychological screening and counselling become standard components of care for patients with cirrhosis-related HCC. Integrating routine psychological screening, counseling, and social support interventions can significantly improve HRQoL outcomes and treatment adherence among patients with cirrhosis-related HCC. Previous research also underscores that systematic psychosocial assessment in hepatology care enhances both psychological well-being and clinical prognosis of HCC patients [16].

Demographic variables are essential in understanding the context in which sociocultural factors and psychological factors influence HRQoL in patients with cirrhosis-related liver cancer. By examining the age and BMI distribution (**Figure 1**), we can better appreciate how these demographic characteristics may interact with sociocultural factors, such as education level and occupation, to shape HRQoL outcomes. Furthermore, these variables set the stage for understanding the relationships between sociocultural factors, psychological factors, and HRQoL, and highlight the importance of considering demographic characteristics in the development of targeted interventions to improve HRQoL in this patient population.

Liver cirrhosis and HCC have a substantial influence on daily living and social interactions [17–20]. The physical toll of these illnesses can lead to a loss of autonomy, necessitating others to aid with daily duties. This, in turn, can strain relationships with family and friends, making it harder to complete commitments and meet emotional demands [19,21], as well as decrease physical closeness [21]. Feelings of being a burden can also contribute to social isolation [18,19]. Additionally, poor health might lead to withdrawal from social activities and abandoning work, further destroying social relationships [20–22].

The stigmatizing aspect of liver disorders contributes significantly to emotional discomfort [18,23], further reducing quality of life. Some persons may feel lonely due to perceived lack of social support compared to other illnesses [18], while others may suffer shame and embarrassment associated with liver diseases, leading to social avoidance and isolation [23,24]. A recent study showed that after treatment, many HCC survivors experience depressive symptoms that are strongly associated with poorer HRQOL [25]. Consistent with recent empirical data, psychological resources such as resilience and external social support were positively associated with psychosocial adjustment among postoperative HCC patients, and fear of progression partially mediated these effects. These findings support routine psychosocial screening and targeted resilience-building and social support interventions as part of comprehensive HCC care [26].

These results are contrary to other research that revealed liver disease patients had higher social and family-related quality of life than the general population [27–29]. The explanation for this gap could be related to the restricted range of items used to evaluate social quality of life, which might not completely cover the intricacies of patient experiences in this area. Furthermore, no HRQoL assessment instrument currently applied in liver cancer studies analyzes the occurrence or impact of stigma.

In line with our findings, Sobhonslidsuk et al. [29] discovered that poor socioeconomic status and financial difficulty had an impact on numerous measures of HRQoL, and that advanced liver sickness was associated with its deterioration. In keeping with our discovery that married status was positively correlated with social functioning, Askgaard et al. [30] similarly observed that poor functional and structural social interactions were linked to reduced mental quality of life and an increased risk of mortality in patients with liver illness. A recent study showed that sociodemographic and socioeconomic characteristics were found to be significant predictors of both systemic inflammation and depressive symptomatology in hepatocellular carcinoma patients. These results suggest that gender-sensitive psychosocial interventions should be designed for patients with HCC from lower socioeconomic backgrounds who are at elevated risk of experiencing depressive symptoms [31].

Similar to our result that education level was positively related to physical functioning, Jafree et al. [32] found that in patients with liver disease, the severity of symptoms, coping techniques, and doctor communication predicted mental health and quality of life. The role of social determinants of health in determining liver cancer risk factors and care accessibility was underlined by Kondili et al. [33], which is in accordance with our discovery that cognitive functioning was favorably related to cultural background.

When Gupta et al. [6] looked at the impact of liver disease patients' performance status, liver function, and stage of liver cancer on their quality of life, they identified a relationship between poorer liver function and lower quality of life. An intriguing discovery that might be connected to the shifts in social interactions and everyday activities during the pandemic was shown by Skladany et al. [34], where it was observed that individuals with liver cirrhosis scored their HRQ substantially higher during the epidemic compared to before the pandemic.

Several research studies, in contrast to ours, revealed numerous indicators of liver disease patients' quality of life. As an illustration, Sobhonslidsuk et al. [29] discovered that growing older and having a female sex lowered physical health, but we did not detect a significant association between aging and quality of life ratings. While we could not identify a significant link between marital status and mental quality of life, Askgaard et al. [30] indicated that living alone was related to lower mental quality of life.

The variations in findings between this study and others may be ascribed to several reasons. Firstly, the restricted range of items employed to evaluate social quality of life in some research [24,27,28] would not have represented the intricacies of patient experiences, leading to divergent outcomes. Additionally, the lack of HRQoL evaluation instruments that specifically investigate the occurrence or impact of stigma in liver cancer research could have contributed to the disparities. It is likely that studies that showed higher social and family-related quality of life in liver disease patients compared to the general population [24,27,28] might have had a more comprehensive assessment of social quality of life, which could have influenced their results.

Another possible explanation for the disparities is the diverse demographics and features of the research populations. For instance, studies that reported a substantial

link between aging and quality of life ratings [29] might have had an older cohort or a different age distribution, which could have altered the outcomes. Similarly, the association between married status and mental quality of life might have been altered by the number of participants who lived alone or had different family dynamics [30]. Furthermore, the impact of socioeconomic position and financial constraints on HRQoL might have been more prominent in specific studies [29] due to the economic backdrop or availability of healthcare resources.

The timing and setting of the research could also have played a role in the disparities. For example, the study by Skladany et al. [34] that reported greater HRQoL scores during the pandemic might have been influenced by the specific circumstances and coping techniques used by patients during that period. In contrast, research conducted during non-pandemic periods would have given different results due to the differing degrees of social support, anxiety, and stress experienced by patients. Additionally, the discrepancies in findings could be related to the methodological approaches and tools employed to assess HRQoL. Different research might have employed distinct HRQoL instruments, which could have led to differing results due to changes in the questions, scales, and scoring systems used. The lack of uniformity in HRQoL measures could have led to the variations in outcomes among research.

However, there were a number of limitations to our research. We used data that already existed, which might be biased because it is retrospective in nature. Furthermore, our sample size may be too small to accurately reflect the larger community of people whose liver cancer resulted from cirrhosis. Furthermore, the EORTC QLQ-C30 scale was used for this investigation because of its proven validity and reliability in evaluating HRQoL among cancer patients, including those with liver cancer. The scale's complete assessment of physical, emotional, social, and cognitive functioning allows for a detailed understanding of the impact of sociocultural and psychological factors on HRQoL in patients with cirrhosis-related liver cancer. Nonetheless, it is important to recognize that the scale may inadequately encompass the intricacies of social quality of life, especially with liver illness, where stigma, social avoidance, and isolation may significantly influence outcomes. This restriction may contribute to the inconsistencies identified between our study and others, which have reported higher social and family-related quality of life in liver disease patients compared to the general population. Furthermore, the lack of HRQoL evaluation instruments that specifically investigate the occurrence or impact of stigma in liver cancer studies may potentially contribute to these discrepancies. Despite these limitations, our study's findings are supported by prior research, which shows the role of sociocultural and psychological elements in defining HRQoL in patients with liver cancer.

We observed that education level was positively associated with physical functioning, as individuals with higher educational attainment demonstrated better health literacy, enabling them to adhere to treatment plans and engage in proactive health behaviors that enhanced their physical capacity. Employment status was linked to emotional functioning, with employed patients exhibiting improved emotional well-being due to financial stability and social interactions that reduced emotional distress and fostered a sense of purpose. Marital status emerged as a

strong predictor of social functioning, with spousal support providing essential emotional and practical resources, enhancing social engagement, and mitigating feelings of isolation. Family support was closely correlated with role functioning, as familial networks helped patients manage daily responsibilities and reinforced their sense of purpose within the family and community. Furthermore, cultural background influenced cognitive functioning, indicating that cultural norms and values shaped coping mechanisms and mental resilience, which impacted cognitive clarity and decision-making.

Our analysis also highlighted the critical role of psychological factors in shaping HRQoL. Anxiety was found to negatively affect emotional functioning, as it heightened emotional instability and impaired the ability to manage the stress associated with chronic illness. Depression strongly impacted social functioning, as it hindered social interactions and contributed to social withdrawal. Stress moderately affected physical functioning, likely due to its exacerbation of fatigue and other physical symptoms. Social support emerged as a key determinant of social functioning, with supportive relationships alleviating emotional and social challenges and promoting greater engagement in social roles.

Based on these findings, we developed actionable recommendations to improve HRQoL for patients with cirrhosis-related liver cancer. We advocated for tailored educational programs to enhance health literacy and treatment adherence. Facilitating flexible employment opportunities and vocational training was recommended to improve patients' emotional and financial stability. We emphasized the importance of family-centric care models that actively involved family members in the care process to enhance role functioning. Additionally, we proposed implementing culturally sensitive care practices to address cognitive and psychological challenges influenced by cultural norms and values. Integrated psychosocial services, including counseling and support groups, were identified as critical to addressing anxiety, depression, and stress while fostering coping self-efficacy. Finally, we recommended establishing peer support networks and community resources to strengthen social engagement and reduce the psychosocial burden on patients. Our study underscores the importance of addressing both sociocultural and psychological factors in a holistic approach to improving HRQoL in patients with cirrhosis-related liver cancer. By integrating these findings into clinical care, we aim to contribute to more comprehensive and patient-centered healthcare strategies.

Clinical implications

The findings of this study have several important clinical implications for the management of patients with cirrhosis-related hepatocellular carcinoma (HCC). Understanding the sociocultural and psychological factors influencing HRQoL highlights the need for a more holistic, patient-centered approach in hepatology and oncology care. Integrating psycho-oncological services into routine clinical practice is critical to address the emotional, social, and cognitive challenges faced by this population. Such integration should include systematic psychological screening,

culturally sensitive counseling, and family-based support interventions as essential components of comprehensive care.

From a clinical perspective, healthcare providers should adopt multidisciplinary models that combine medical treatment with psychosocial and educational programs to enhance coping mechanisms, treatment adherence, and overall well-being. For example, structured psycho-educational interventions can improve patients' health literacy, while tailored counseling can mitigate anxiety, depression, and stress associated with chronic liver disease. Culturally competent care is particularly important, as beliefs and stigma surrounding liver disease may influence patients' willingness to seek help and adhere to treatment recommendations.

Moreover, involving family members in care planning can strengthen emotional support systems and enhance role functioning, leading to improved HRQoL outcomes. Hospitals and clinics should consider training hepatology staff in basic psycho-oncological principles and establishing referral pathways to specialized psychological services when needed. Policymakers and healthcare administrators must also recognize the cost-effectiveness of early psychosocial interventions in reducing hospitalization rates and improving patient satisfaction.

Ultimately, these clinical implications underscore that addressing sociocultural and psychological determinants is not ancillary but central to optimal management of cirrhosis-related HCC. Embedding psycho-oncology into hepatology practice represents a key step toward achieving equitable, holistic, and patient-focused care.

5. Conclusion

Our assessments underscore the significance of social and cultural variables in determining the quality of life for patients whose liver cancer has advanced from cirrhosis. The observations also highlight how crucial it is for healthcare professionals to take these elements into account when designing initiatives aimed at enhancing patients' quality of life. This requires accounting for aspects such as occupation, family support, education level, and cultural background. Our findings reaffirm that psycho-oncological care is essential in the management of cirrhosis-related HCC to improve HRQoL outcomes and ensure holistic patient-centered care.

Author contributions: Study concept and design, LZ, and AS; analysis and interpretation of data, WH, and YW; drafting of the manuscript, LZ; critical revision of the manuscript for important intellectual content, LZ, AS, and YH; statistical analysis, LZ. All authors have read and agreed to the published version of the manuscript.

Ethical approval: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of The People's Hospital of Rugao (protocol code KY202001012, date of approval: 23 March 2020).

Informed consent statement: Informed consent was obtained from all subjects involved in the study.

Conflict of interest: The authors declare no conflict of interest.

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