ORIGINAL ARTICLE

Psychiatric Profile Study in Egyptian patients with Budd-Chiari syndrome

Enaam A. Al Mowafy [a,*], Rania E. H. Kasem [b], Zeinab M. Hefny [a], Amir M. Farid [a], Ahmed F. Sherief [a]

[a] Department of Tropical Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt
[b] Department of Neuropsychiatry, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Abstract

Background: ***Budd-Chiari syndrome (BCS) is a rare condition characterized by obstruction of hepatic venous outflow, resulting in considerable morbidity and mortality. Despite its impact, there has been a lack of research examining the psychological impact of this illness. The present cross-sectional study evaluates the psychological dimensions and quality of life (QOL) among Egyptian individuals diagnosed with BCS.***

Results: ***A cross-sectional study involving 42 Egyptian patients diagnosed with BCS, predominantly females, included diverse etiological factors and medical interventions. The study revealed high rates of severe depression (40.5%) and moderate to severe anxiety (64.4%), which had an adverse impact on the patient's QOL. Furthermore, significant correlations were noted between the severity of liver disease and its psychological impact.***

Conclusion: ***The findings underscore the significance of addressing mental health in the care of individuals with BCS. It is a priority to integrate mental health support into the overall medical management of BCS patients.***

Keywords: Budd-Chiari Syndrome; Hepatic venous outflow obstruction; QOL; Depression; Anxiety

1. Introduction

Budd-Chiari syndrome (BCS) is a life-threatening hepatic condition characterized by the obstruction of hepatic venous outflow.[1] This obstruction can result from various factors, including thrombosis, inferior vena cava webs, and compression caused by abscesses, cysts, or malignant growths.[2] The estimated prevalence of BCS is 11 cases per million individuals worldwide, with variations observed across

different regions, particularly in Asia and Europe.[3]

The term "critical liver disease" includes a range of conditions, each impacting health-related quality of life (QOL) to varying degrees.[4,5] However, as BCS advances and complications arise, QOL tends to deteriorate, irrespective of the underlying etiology. BCS itself presents significant morbidity and mortality, posing immense challenges physically and emotionally for individuals living with it.[6]

Symptoms such as abdominal pain, fatigue, and jaundice significantly disrupt daily life and overall well-being.

Hepatic encephalopathy, variceal haemorrhage, hepatorenal syndrome, portal hypertension, bacterial peritonitis, and hepatocellular carcinoma (HCC) are some of the complications that can happen. These are mostly caused by underlying conditions and the severity of the liver failure. The constant discomfort and unpredictable nature of symptoms and complications often lead to feelings of frustration, helplessness, and anxiety.[7]

Navigating the healthcare system is challenging due to the BCS's rarity and complexity. Patients often encounter limited knowledge and understanding of their condition among healthcare providers, leading to feelings of isolation and difficulty accessing support and resources. This psychological burden further compounds the emotional toll of physical symptoms.[8]

Accepted 10 February 2025.
Available online 30 April 2025

* Corresponding author at: Tropical Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt.
E-mail address: drenaamali@yahoo.com (E. A. Al Mowafy).

https://doi.org/10.21608/aimj.2025.446513

Uncertainty about the prognosis and long-term management causes fear and worry. The potential necessity for invasive procedures like liver transplantation or surgical interventions adds to the overwhelming psychological distress, resulting in persistent anxiety, depression, or even post-traumatic stress disorder.[9]

Despite its significance, the psychological impact of BCS is still understudied.[10] Our study aimed to evaluate the psychiatric aspects and QOL of Egyptian patients diagnosed with BCS.

2. Patients and methods

Our cross-sectional study was conducted from March 2021 to January 2023 and involved 42 participants diagnosed with BCS. Participants were recruited from the outpatient BCS clinic in the tropical medicine department of Ain Shams University. There was no age or sex preference in the participant selection process. We included individuals aged ≥18 years diagnosed with BCS based on clinical, ultrasound, and duplex findings. Patients with a prior history of psychiatric illness predating the onset of BCS or other serious medical conditions, especially those with encephalopathy or overt hepatic failure, were excluded.

The study was approved by the Ethical Committee of the Faculty of Medicine, Ain Shams University, and informed consent was obtained from all participants. All participants underwent a comprehensive assessment, including history taking, a focused clinical examination, and abdominal ultrasonography for diagnosis confirmation. Laboratory tests were conducted to assign the Child-Pugh score and the Model for End-Stage Liver Disease (MELD) score.

A complete psychiatric assessment was performed using the Beck questionnaire for depression[11] and anxiety [12], while the QOL was assessed using a WHO-approved questionnaire.[13] All assessments were translated into Arabic and validated by a senior psychiatrist. [14, 15, 16]

Liver Disease Severity Scores Child-Pugh (CHILD) Score:

The CHILD score evaluates the prognosis of chronic liver disease and the severity of liver cirrhosis. The score is based on five clinical measures: total bilirubin, serum albumin, prothrombin time, ascites, and hepatic encephalopathy. The total score classifies liver disease severity into three classes (A, B, and C), with each rating ranging from 1 to 3. Higher scores indicate more severe liver dysfunction.

Model for End-Stage Liver Disease (MELD) Score:

The MELD score predicts survival in patients with end-stage liver disease. It is calculated using bilirubin, creatinine, and INR (international normalized ratio). Scores range from 6 to 40, with higher scores indicating more severe disease and increased mortality risk. The study's correlation of the MELD score with QOL shows how disease severity impacts patients' overall well-being and the importance of timely medical intervention.

Psychiatric Assessments Beck Depression Inventory (BDI)

The BDI assesses depression severity through 21 multiple-choice questions, each scored from 0 to 3.

Total scores range from 0 to 63, with higher scores indicating more severe depressive symptoms.

Beck Anxiety Inventory (BAI)

The BAI measures anxiety severity with 21 questions, each describing a common anxiety symptom rated on a scale from 0 (not at all) to 3 (severely). Total scores range from 0 to 63, with higher scores indicating greater anxiety levels.

WHO Quality of Life (WHOQOL) Questionnaire

The WHOQOL questionnaire assesses quality of life across four domains: physical health, psychological health, social relationships, and environmental health. Scores are scaled positively, so higher scores indicate better QOL. Lower scores in BCS patients reflect the significant impact of the disease on various life aspects, necessitating comprehensive care that addresses both physical and mental health.

3. Results

The study included 42 Egyptian patients diagnosed with BCS, with an average age of 33 years and a predominance of female participants (73.8%). Patients came from different areas of residence all over Egypt.

Etiological factors varied, with 66.7% attributed to a single cause and 33.3% to multiple causes. Treatment decisions varied among patients, with 12% on medical treatment, 59.5% undergoing radiological interventions such as transjugular intrahepatic portosystemic shunt (TIPS) and angiography, and 28.5% requiring liver transplantation. Approximately half of the patients (47.6%) underwent some form of intervention, while the remaining 52.4% did not. The average duration of the disease was 4.75 years (Table 1).

Table 1. Socio-demographic characteristics among the study participants (n=42)

CHARACTER	FREQUENCY N	PERCENTAGE (%)
AGE (YEARS): MEAN ± SD	33 ± 9.26	
GENDER		
MALE	11	26.2
FEMALE	31	73.8
ETIOLOGY		
SINGLE CAUSE	28	66.7
MULTIPLE CAUSES	14	33.3
BCSG DECISION (N= 42)		
MEDICAL TREATMENT	5	12

RADIOLOGICAL (TIPS AND ANGIOPLASTY)	25	59.5
LIVER TRANSPLANTATION	12	28.5
OUTCOME		
DID NOT UNDERGO INTERVENTION.	22	52.4
UNDERWENT INTERVENTION	20	47.6
DURATION OF THE DISEASE (YEARS): MEAN ± SD	4.75 ± 2.76	

Table 2 presents the CHILD score with an average of 9.49 ± 2.67 and the MELD score with an average of 16.46 ± 5.36. Regarding depression levels measured by the Beck Depression Inventory (BDI), 14.3% reported no symptoms, while the remainder showed varying degrees of severity: mild (19%), moderate (19%), severe (40.5%), and extreme (7.1%). Anxiety levels, assessed using the Beck Anxiety Inventory (BAI), ranged from none (9.5%) to mild (26.1%), moderate (40.4%), and severe (24%). WHO-QOL scores across four domains were as follows: 44.88 ± 17.05 SD for the physical health domain, 42.35 ± 15.71 SD for the psychological domain, 42.68 ± 19.51 SD for social relationships, and 42.15 ± 15.18 SD for the environmental domain.

Table 2. Distribution of studied participants according to CHILD, MELD, BDI, BAI and QOL scores:

VARIABLES	FREQUENCY N	PERCENTAGE (%)
CHILD SCORE: MEAN ± SD (N = 42)	9.49±2.67	
MELD: MEAN ± SD (N = 42)	16.46±5.36	
BDI (N = 42)		
NO	6	14.3
MILD	8	19
MODERATE	8	19
SEVERE	17	40.5
EXTREME	3	7.1
BAI ((N = 42)		
NO	4	9.5
MILD	11	26.1
MODERATE	17	40.4
SEVERE	10	24
QOL (PHYSICAL HEALTH): MEAN ± SD (N = 42)	44.88±17.05	
QOL (PSYCHOLOGICAL): MEAN ± SD (N = 42)	42.35±15.71	
QOL (SOCIAL RELATIONSHIPS): MEAN ± SD (N = 42)	42.68±19.51	
QOL (ENVIRONMENT): MEAN ± SD (N = 42)	42.15±15.18	

Table 3 shows the correlations between liver disease severity scores (CHILD and MELD) and psychiatric assessments in our study. Regarding the BDI, there was a weak negative correlation with both CHILD (-0.09, p = 0.57) and MELD (-0.20, p = 0.21) scores. Conversely, the BAI showed a moderately positive correlation with CHILD (0.29, p = 0.09) but not with MELD (0.04, p = 0.81) scores. Analysis of QOL domains indicated significant positive correlations with CHILD and MELD scores for physical health (CHILD: 0.44, p = 0.006; MELD: 0.46, p = 0.005), suggesting a stronger association with liver disease severity. In the QOL psychological domain, there was a weak positive correlation with CHILD (0.27, p = 0.10) scores but not with MELD (0.13, p = 0.46). Social relationships exhibited a moderate positive correlation with CHILD (0.34, p = 0.04) and a weak correlation with MELD (0.30, p = 0.07). Finally, the environmental domain showed no significant correlations between the CHILD and MELD scores.

Table 3. The correlation between scores of liver disease (CHILD and MELD) and scores of psychiatric assessments of the studied patients

	CHILD		MELD	
	Correlation*	P value	Correlation*	P value
BDI	-0.09	0.57	-0.20	0.21
BAI	0.29	0.09	0.04	0.81
QOL (PHYSICAL HEALTH)	0.44	0.006**	0.46	0.005**
QOL (PSYCHOLOGICAL)	0.27	0.10	0.13	0.46
QOL (SOCIAL RELATIONSHIPS)	0.34	0.04**	0.30	0.07
QOL (ENVIRONMENT):	0.20	0.25	0.26	0.11

*PEARSON CORRELATION COEFFICIENT
** SIGNIFICANT P VALUE

Table 4 shows the associations between various characteristics of the study participants and their liver disease scores, including CHILD and MELD. Gender analysis showed no significant difference in either CHILD (p = 0.62) or MELD (p = 0.94) scores between males (11) and females (31). Similarly, whether attributed to a single cause or multiple causes, etiology did not significantly impact either CHILD (p = 0.39) or MELD (p = 0.94) scores. However, the choice of BCS management revealed a significant difference in CHILD scores (p = 0.007), with those on medical treatment (5) scoring differently compared to those undergoing radiological interventions (25) or liver transplantation (12). Conversely, MELD scores did not significantly differ based on BCS management decisions (p = 0.56). Remarkably, the outcome of the intervention, whether undergoing it or not, significantly affected both CHILD (p = 0.007) and MELD (p = 0.04) scores.

Table 4. The associations between the different patients' characteristics and their liver disease scores

	CHILD		MELD	
	Test	P value	Test	P value
GENDER MALE (11) FEMALE (31)	129*	0.62	142.50*	0.94
ETIOLOGY SINGLE CAUSE (28) MULTIPLE CAUSES (14)	113.50*	0.39	137.50*	0.94
BCSG DECISION (N= 42) MEDICAL TREATMENT (5) RADIOLOGICAL (TIPS AND ANGIOPLASTY) (25) LIVER TRANSPLANTATION (12)	5.18**	0.08	1.15**	0.56
OUTCOME DID NOT UNDERGO INTERVENTION (20) UNDERWENT INTERVENTION (22)	95.50*	0.007	118*	0.04
DURATION OF THE DISEASE (YEARS): MEAN ± SD	0.24***	0.57	0.43***	0.29
AGE (YEARS): MEAN ± SD	0.019***	0.91	0.15***	0.36

*INDEPENDENT-SAMPLES MANN-WHITNEY U TEST
**INDEPENDENT-SAMPLES KRUSKAL-WALLIS TEST
***SPEARMAN'S RHO CORRELATION COEFFICIENT

Furthermore, the duration of the disease, measured in years, exhibited a significant positive correlation with CHILD ($p < 0.001$) but not MELD ($p = 0.57$) scores. Similarly, age showed a significant positive correlation with CHILD ($p = 0.019$) but not MELD ($p = 0.91$) scores.

Table 5 Analysis of gender showed no statistically significant difference in BDI scores between males and females ($p = 0.10$). However, there was a significant disparity in the QOL Physical Health domain score ($p = 0.04$), with females reporting lower scores compared to males. Gender did not yield any significant variations in BAI or other QOL domains. When examining etiology, there were no significant differences in BDI and BAI scores among patients with single or multiple causes of BCS. Similarly, there were no significant variations in QOL scores across all domains based on etiology. The management decisions for BCS, whether it be medical treatment, radiological interventions, or transplantation, did not have a significant impact on BDI, BAI, or QOL scores. The outcome of the intervention, regardless of whether the patient underwent it or not, also did not significantly affect BDI, BAI, or QOL scores. However, the duration of the disease in years showed a significant correlation with BAI ($p = 0.02$) and QOL Physical Health ($p = 0.02$) scores. Age exhibited a significant negative correlation with BAI scores ($p = 0.03$), indicating higher levels of anxiety among younger patients. Additionally, a noticeable negative correlation between age and QOL social relationship scores emerged ($p = 0.07$), suggesting a lower quality of life in older patients within this domain.

Table 5. The associations between the different characteristics of the studied patients and their different psychiatric scores

	BDI		BAI		QOL							
					Domain1		Domain 2		Domain 3		Domain 4	
	test	P value	test	P value	test	P value	test	P value	test	P value	test	P value
GENDER MALE FEMALE	228*	0.10	208*	0.15	90*	0.04	111*	0.15	27.50*	0.007	108.5*	0.12
ETIOLOGY SINGLE MULTIPLE	113*	0.39	90.5*	0.17	124.5*	0.85	121.5*	0.77	168.5*	0.18	114*	0.59
BC DECISION MEDICAL RADIOLOGICAL TRANSPLANTATION	221.5**	0.97	188**	0.76	203**	0.95	204**	0.93	172**	0.46	195**	0.90
OUTCOME DID NOT UNDERGO INTERVENTION. UNDERWENT INTERVENTION	221.5*	0.97	188*	0.76	203*	0.95	204*	0.93	172*	0.46	195.5*	0.90
DURATION (YEARS):	0.27	0.53	0.47	0.24	0.64	0.09	0.20	0.64	0.78	0.02	0.02	0.97
AGE (YEARS):	0.19	0.24	0.11	0.50	0.03	0.87	0.20	0.22	0.07	0.67	0.1	0.54

*INDEPENDENT-SAMPLES MANN-WHITNEY U TEST
**INDEPENDENT-SAMPLES KRUSKAL-WALLIS TEST
***SPEARMAN'S RHO CORRELATION COEFFICIENT

4. Discussion

BCS is a rare but potentially life-threatening condition characterized by hepatic venous outflow obstruction.[6] Despite its heavy psychosocial impact, few systematic attempts have been made to study psychiatric morbidity and its associated risk factors in patients with chronic liver diseases, particularly those leading to HCC.[17]

Our study aims to explore the psychiatric profile of BCS patients in Egypt to identify potential areas for psychosocial intervention for the optimization of mental health services for these patients.

A complex interplay of demographic characteristics is associated with BCS.[18] Budd Chiari Syndrome affects individuals of diverse age groups, with the highest incidence occurring in young to middle-aged adults between 20 and 50 years old, [19], with the most affected in the third and fourth decades.[3] Our study involved Egyptian patients diagnosed with BCS, with a mean age of 33 years. Most participants were female, comprising 73.8% of the cohort. Similarly, Sakr et al., in their epidemiological study regarding BCS Egyptian patients, stated that More females than males were affected (61.7% vs. 38.3%), with a mean patient age of 28.64 ± 8.35 years for males and 28.88 ± 9.08 years for females.[20]

The etiology of BCS encompasses many conditions, including thrombophilia, myeloproliferative neoplasms, systemic lupus erythematosus, tuberculosis, abdominal trauma, pregnancy, oral contraceptives, and HCC, among others. Genetic mutations, specifically those affecting coagulation pathways or venous outflow tract development, may predispose individuals to

develop this syndrome.[18, 21] Our study divided the etiology of BCS into a single cause in 66.7% or multiple causes in 33.3% of the study population.

Consistent with Sakr et al., 48.9% [20] and Uskudar et al. found that 72% of their studied group of patients had a single cause of the disease.[22]

Treating BCS is complex and multifaceted.[23] Medical interventions can vary depending on the severity and underlying cause of BCS. Anticoagulant therapy may sometimes be administered to prevent blood clot formation and promote blood flow. Additionally, angioplasty or stent placement procedures may be considered if the obstruction is deemed significant. In rare instances where these interventions[24] prove ineffective, a liver transplant may be the ultimate solution. Moreover, managing the symptoms and complications of BCS is essential to medical decision-making. Ascites, or fluid accumulation in the abdomen, may require drainage procedures or diuretic medications. Similarly, hepatic encephalopathy, a condition affecting brain function, may necessitate lactulose or other medications to alleviate symptoms.[18] In our study, medical decisions varied among patients, with 12% opting for medical treatment, 59.5% undergoing radiological interventions such as TIPS and angiography, and 28.5% requiring liver transplantation. Nearly half of the patients (47.6%) underwent some form of intervention. The mean duration of the BCS is significantly varied and spans from a few weeks to several years, highlighting the unpredictable nature of this formidable condition.[5] Our study. The mean duration of the disease among the study participants was 4.75 years. The CHILD score averaged 9.49 ± 2.67, and the MELD score averaged 16.46 ± 5.36.

BCS is a cause of liver cirrhosis and has a relation with anxiety and psychological affection. BCS could be related to QOL affection.[25] In our study, depression levels, assessed by the BDI, varied among patients, with 14.3% reporting no symptoms and the rest experiencing varying degrees of severity. Anxiety levels, evaluated through the BAI, ranged from none to severe. QOL across four domains was assessed, with mean scores for each domain provided. Significant positive correlations were found between QOL domains and CHILD and MELD scores. The liver's decline in liver functions weakens catecholamine inactivation, resulting in the patient's personality and behavioural abnormalities,[26] which may explain our findings.

Limitation: The study's findings are based on a sample size of 42 participants from a single centre, which may limit the generalizability of the results. The study's cross-sectional design could introduce selection bias, as it only captures a snapshot of patients seeking care at tertiary centres, potentially overlooking those with different demographic and clinical profiles. Future studies could benefit from incorporating other necessary outcome measures, such as cognitive function, social support, and coping strategies, to provide a more comprehensive understanding of the patient's experiences.

Abbreviations
BAI: Beck Anxiety Inventory
BDI: Beck Depression Inventory
HCC: Hepatocellular carcinoma
MELD: Model for End-Stage Liver Disease
QOL: Quality of Life
SD: Standard Deviation
TIPS: Trans jugular Intrahepatic Portosystemic Shunt
WHO: World Health Organization

4. Conclusion

Psychiatric assessments reveal depression and anxiety levels among BCS patients, impacting QOL. Correlation analysis reveals the physical and mental health interplay in BCS patients, emphasizing the need for comprehensive care.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

Funding

No Funds : Yes

Conflicts of interest

There are no conflicts of interest.

References

1. European Association for the Study of the Liver. Electronic address: easloffice@easloffice.eu. EASL Clinical Practice Guidelines: Vascular diseases of the liver. J Hepatol. 2016;64(1):179-202.
2. Bayraktar UD, Seren S, Bayraktar Y. Hepatic venous outflow obstruction: three similar syndromes. World J Gastroenterol. 2007;13(13):1912-1927.
3. Li Y, De Stefano V, Li H, et al. Epidemiology of Budd-Chiari syndrome: A systematic review and meta-analysis. Clin Res Hepatol Gastroenterol. 2019;43(4):468-474.
4. Younossi ZM, Kiwi ML, Boparai N, Price LL, Guyatt G. Cholestatic liver diseases and health-related quality of life. Am J Gastroenterol. 2000;95(2):497-502.
5. Younossi Z, Aggarwal P, Shrestha I, et al. The burden of non-alcoholic steatohepatitis: A systematic review of health-related quality of life and patient-reported outcomes. JHEP Rep. 2022;4(9):100525.

6. Alukal JJ, Zhang T, Thuluvath PJ. A Nationwide Analysis of Budd-Chiari Syndrome in the United States. J Clin Exp Hepatol. 2021;11(2):181-187.
7. Valla DC. Budd-Chiari syndrome/hepatic venous outflow tract obstruction. Hepatol Int. 2018;12(Suppl 1):168-180.
8. Mansour-Ghanaei F, Afshar S, Shafaghi A, et al. A case of chronic Budd-Chiari syndrome in 24 years old man complicating secondary antiphospholipid syndrome in association with autoimmune hepatitis. International Biological and Biomedical Journal. 2020;6(3). Accessed January 4, 2025.
9. Ferreira RL, do Nascimento IJB, de Almeida VIA, et al. The utilisation of primary health care system concepts positively impacts the assistance of patients with rare diseases despite limited knowledge and experience by health care professionals: A qualitative synopsis of the evidence including approximately 78 000 individuals. J Glob Health. 2023;13:04030.
10. Marchesini G, Bianchi G, Amodio P, et al. Factors associated with poor health-related quality of life of patients with cirrhosis. Gastroenterology. 2001;120(1):170-178.
11. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol. 1988;56(6):893-897.
12. Bwck AT, Waed CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry. 1961;4:561-571.
13. Janca A. World Health Organization Division of Mental Health and Prevention of Substance Abuse. American Journal of Psychiatry. 1998;155(2):277-277.
14. Ghareeb AG. Manual of Arabic BDI-II. Alongo Press. Cairo inventory: The author's twenty-five years of evaluation. Clin Psychol Rev 2000;8:77–100.
15. Al-Shatti, Taghreed S. Psychometric properties of the Arabic version of the Beck Anxiety Inventory in the state of Kuwait. Journal of Educational & Psychological Sciences, 2015;16, 431–463.
16. Dalky HF, Meininger JC, Al-Ali NM. The Reliability and Validity of the Arabic World Health Organization Quality of Life-BREF Instrument Among Family Caregivers of Relatives With Psychiatric Illnesses in Jordan. J Nurs Res. 2017;25(3):224-230.
17. Liu L, Qi XS, Zhao Y, Chen H, Meng XC, Han GH. Budd-Chiari syndrome: current perspectives and controversies. Eur Rev Med Pharmacol Sci. 2016;20(15):3273-3281.
18. Sharma A, Keshava SN, Eapen A, Elias E, Eapen CE. An Update on the Management of Budd-Chiari Syndrome. Dig Dis Sci. 2021;66(6):1780-1790.
19. Abdel Hameed MR, Elbeih EAS, Abd El-Aziz HM, et al. Epidemiological Characteristics and Etiology of Budd-Chiari Syndrome in Upper Egypt. J Blood Med. 2020;11:515-524.
20. Sakr M, Barakat E, Abdelhakam S, et al. Epidemiological aspects of Budd-Chiari in Egyptian patients: a single-center study. World J Gastroenterol. 2011;17(42):4704-4710.
21. Zu M, Xu H, Zhang Q, et al. Review of Budd-Chiari Syndrome. J Interv Med. 2020;3(2):65-76.
22. Uskudar O, Akdogan M, Sasmaz N, Yilmaz S, Tola M, Sahin B. Etiology and portal vein thrombosis in Budd-Chiari syndrome. World J Gastroenterol. 2008;14(18):2858-2862.
23. Goel RM, Johnston EL, Patel KV, Wong T. Budd-Chiari syndrome: investigation, treatment and outcomes. Postgrad Med J. 2015;91(1082):692-697.
24. Rössle, M. (2023). Interventional treatment of Budd-Chiari syndrome. Diagnostics (Basel, Switzerland), 13(8), 1458.
25. Qin Z, Shen Y, Wu Y, Tang H, Zhang L. Analysis of risk factors for mental health problems of inpatients with chronic liver disease and nursing strategies: A single center descriptive study. Brain Behav. 2021;11(12):e2406.
26. Ou M, Guo X, Li Y, et al. Differences in anxiety among patients with liver cirrhosis with different compensation abilities. Am J Transl Res. 2022;14(7):5187-5194.