Original article

Prevalence and associated factors of anxiety and depression in liver cirrhosis at outpatient clinic

Naphat Sirinimnualkul[a], Piyawat Komolmit[b], Teerayuth Rungnirundorn[a,*]

[a]*Department of Psychiatry, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*
[b]*Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*

Background: Liver cirrhosis is one of the chronic medical conditions which frequently leads to psychiatric comorbidities including depression and anxiety disorder.
Objective: The aim of this study was to evaluate the prevalence and associated factors of anxiety and depression in patients with liver cirrhosis in outpatient clinic.
Methods: Patients with liver cirrhosis aged from 18 years and above, excluded active liver malignancy, were recruited from liver clinic at outpatient of department of medicine. Anxiety and depression were identified using Thai Hospital Anxiety and Depression Scale (THAI-HADS). Descriptive statistic was applied to estimate prevalence of anxiety and depression and factors associated with each condition was analyzed by logistic regression analysis.
Results: Of 108 subjects, 53.7% were female with mean age approximately 60 years. Totally, 55.5% of the subjects had compensated cirrhosis and the most common etiology was hepatitis C virus (33.3%). The prevalence of anxiety was 10.2% and depression was 11.1%. The predictive factors for anxiety were being male (OR = 11.3, P = 0.01), having compensated liver cirrhosis (OR = 5.9, P = 0.045), having poor social support (OR = 3.9, P = 0.047) and having three or more of physical symptoms (OR = 9.6, P = 0.007). With regard to depression, the predictors were being male (OR = 6.4, P = 0.024), having poor social support (OR = 5.6, P = 0.025) and having three or more of physical symptoms (OR = 5.2, P = 0.026).
Conclusion: The prevalence of anxiety and depression in patients with liver cirrhosis at outpatient clinic was approximately 10.0%. The predictive factors for those psychiatric conditions were being male, having poor social support and having numbers of physical symptoms. In addition, having compensated liver cirrhosis was also a risk factor for anxiety.

Keywords: Prevalence, factors, anxiety, depression, cirrhosis.

Liver cirrhosis is one of the chronic and severe medical conditions which can be found in patients with chronic liver disease.[1] From a nationwide study in Thailand, complications from cirrhosis are significant public health problems with the mortality rate of up to 10.7% in hospitalized patients.[2] In addition, in western countries, 90.0% of patients with liver cirrhosis develop hepatocellular carcinoma (HCC) which is the third most frequent cause of cancer-related death.[3]

With regard to psychiatric condition, the common comorbidities that can be found in patients with liver cirrhosis are depression and anxiety disorder, which can deteriorate quality of life of the patients.[4-6] From a previous study, the results found that the prevalence of anxiety, by using Hospital Anxiety and Depression Scale (HADS), was 41.4%, and the prevalence depression was 48.1% in patients with liver cirrhosis.[7]

From review literature, there were few studies that investigated the prevalence of anxiety or depression in this population. Moreover, there was no previous research of this issue in Thailand and in clinical service of King Chulalongkorn Memorial Hospital, especially in outpatient clinic of the Department of Internal Medicine where there are numerous patients followed-up in liver disease clinic. To fill the gap mentioned above, this study aims to

investigate prevalence and associated factors of anxiety and depression in patients who diagnosed as liver cirrhosis. The benefit of this study is to estimate the prevalence of the psychiatric conditions and to identify risk factors in order to prepare the protocol for screening, assessment and management in the future.

Materials and methods
Study population

The subjects were 108 followed-up patients in liver disease clinic King Chulalongkorn Memorial Hospital. The subjects were recruited if they aged from 18 years and above and had a diagnosis of cirrhosis as confirmed by compatible clinical, laboratory tests, imaging, and fibroscan findings. In this study, decompensated cirrhotic patients included the patients who currently had complications from portal hypertension and also included individuals who had improved from cirrhotic complications. Cirrhotic complications included portal hypertensive (variceal) bleeding, ascites, hepatic encephalopathy and jaundice. With regard to compensated cirrhotic patients, individuals who had never experienced cirrhotic complications were included. Exclusion criteria included those who had been diagnosed with active liver malignancy (hepatocellular carcinoma) or with impaired ability to communicate. The study has been approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB no.490/62). All subjects provided their written informed consent.

Questionnaires

Data of socio-demographic and clinical-related variables (age, gender, marital status, education level, occupation, economic status, underlying diseases and current physical symptoms) were obtained using questionnaire developed by the researchers. The physical symptoms included fatigue, decrease appetite or weight loss, nausea or vomiting, abdominal pain or bloating, itching skin, jaundice, hair loss, abnormal Bleeding and leg edema. As for liver condition-related data, we reviewed medical records to collect information with regard to BMI, etiologies of liver cirrhosis, severity of liver cirrhosis from Child-Turcotte-Pugh score and current medication.

Thai Hospital Anxiety and Depression Scale (THAI-HADS) was used to collect score of anxiety and depression. The questionnaire is composed of 14 items; 7 items for anxiety subscale and 7 items for depression subscale. The total scores of each subscale range from 0 to 21. A cut off score for having anxiety or depression is 8 and above indicated by previous Thai validation study.[8] If the subjects were identified as having anxiety or depression, they would receive further assessment and treatment from clinical service in psychiatric clinic.

With regard to alcohol consumption and severity of alcohol use, we used Thai Alcohol Use Disorder Identification Test (THAI-AUDIT), a structured and standardized screening instrument for hazardous and harmful alcohol consumption [9-11], for collecting the data. The test is composed of 10 items of questionnaire which covers quantity and frequency of alcohol consumption, drinking behavior, and alcohol-related problems in the past 12 months. The test can categorize drinker into abstinence (score 0), low risk drinker (score 1 - 7), hazardous drinker (score 8 - 15), harmful drinker (score 16 - 19) and possible alcohol dependence (score ≥ 20).

Finally, Thai version Social Support Questionnaire (SSQ) was used to assess social support of the patients. SSQ was designed to measure separately the emotional, tangible and informational functions of social support.[12] Thai version of SSQ was translated and validated. Each question has a score ranged from 0 to 5 which a higher score indicates more social support.[13]

Statistical analysis

Data from the subjects were described as mean, standard deviation (SD), and percentage by descriptive analysis. Association and comparison between having anxiety or depression and not having those conditions were analyzed by using Chi square test and Fisher's exact test. Predictive factors of each condition was analyzed by using binary logistic regression adjusted for variables in socio-demographic, clinical characteristic and social support. Statistical analysis was done using SPSS version 25.0.

Results

Table 1 shows demographic and clinical characteristics of subjects. There were 108 subjects; 60 (55.6%) with compensated cirrhosis and 48 (44.4%) with decompensated cirrhosis. The majority were female (53.7%), married (63.0%), having educational level of university or above (42.6%), being employed (58.3%), having sufficient income with

savings (50.0%) and having average BMI (52.8%). Only 4.6% and 1.9% of the subjects had history of having diagnosis as anxiety and depression consecutively. The most common cirrhotic etiology in all participants was hepatitis C virus (33.3%) followed by hepatitis B virus (30.6%) and autoimmune (18.5%). The majority (75.9%) of the subjects were classified by Child-Turcotte-Pugh score as Child A.

Regarding subgroup analysis between compensated and decompensated cirrhosis, most subjects with compensated cirrhosis aged less than 60 years (71.7%); while in decompensated cirrhosis, most of them were older than 60 years (75.0%). Subjects with decompensated cirrhosis were more likely to have numbers of physical symptoms, medications and admissions.

Table 1. Demographic and clinical characteristics of subjects (n = 108).

Variables	Total n = 108, n (%)	Compensated cirrhosis n = 60, n (%)	Decompensated cirrhosis n = 48, n (%)
Gender			
Male	50 (46.3)	24 (40.0)	26 (54.2)
Female	58 (53.7)	36 (60.0)	22 (45.8)
Age [a]			
≤ 60 years	53 (49.1)	17 (28.3)	36 (75.0)
> 60 years	55 (50.9)	43 (71.7)	12 (25.0)
Marital status			
Single	18 (16.7)	7 (11.7)	11 (22.9)
Married	68 (63.0)	40 (66.7)	28 (58.3)
Divorced	12 (11.1)	7 (11.7)	5 (10.4)
Widowed	10 (9.3)	6 (10.0)	4 (8.3)
Education			
Primary school or below	33 (30.6)	20 (33.3)	13 (27.1)
Secondary school	29 (26.9)	13 (21.7)	16 (33.3)
University or above	46 (42.6)	27 (45.0)	19 (39.6)
Occupation			
Employed	63 (58.3)	29 (48.3)	34 (70.8)
Unemployed/Retired	45 (41.7)	31 (51.7)	14 (29.2)
Income			
Sufficient income with savings	54 (50.0)	31 (51.7)	23 (47.9)
Sufficient income without savings	40 (37.0)	23 (38.3)	17 (35.4)
Insufficient income but not in debt	9 (8.3)	5 (8.3)	4 (8.3)
Insufficient income and in debt	5 (4.6)	1 (1.7)	4 (8.3)
Underlying disease			
Hypertension	39 (36.1)	28 (46.7)	11 (22.9)
Diabetes mellitus	25 (23.1)	16 (26.7)	9 (18.8)
Heart disease	11 (10.2)	8 (13.3)	3 (6.3)
Vitamin D deficiency	18 (16.7)	11 (18.3)	7 (14.6)
Having diagnosed as mental disorder			
Anxiety	5 (4.6)	2 (3.3)	3 (6.3)
Depression	2 (1.9)	0 (0.0)	2 (4.2)
Numbers of physical symptoms			
None	48 (44.4)	27 (45.0)	21 (43.8)
1 - 2	35 (32.4)	23 (38.3)	12 (25.0)
3 - 4	19 (17.6)	9 (15.0)	10 (20.8)
5 and above	6 (5.6)	1 (1.7)	5 (10.4)
Body mass index[b]			
Below average (< 18 kg/m^2)	4 (3.7)	3 (5.0)	1 (2.1)
Average (18 - 25 kg/m^2)	57 (52.8)	27 (45.0)	30 (62.5)
Above average (> 25 kg/m^2)	47 (43.5)	30 (50.0)	17 (35.4)

Table 1. (Con) Demographic and clinical characteristics of subjects (n = 108).

Variables	Total n = 108, n (%)	Compensated cirrhosis n = 60, n (%)	Decompensated cirrhosis n = 48, n (%)
Cirrhotic etiology			
Hepatitis B virus	33 (30.6)	20 (33.3)	13 (27.1)
Hepatitis C virus	36 (33.3)	27 (45.0)	9 (18.8)
Autoimmune hepatitis	20 (18.5)	10 (16.7)	10 (20.8)
Alcoholic hepatitis	17 (15.7)	6 (10.0)	11 (22.9)
NAFLD	7 (6.5)	5 (8.3)	2 (4.2)
Biliary atresia	4 (3.7)	0 (0.0)	4 (8.3)
Other etiologies	5 (4.6)	1 (1.7)	4 (8.3)
Child-Turcotte-Pugh score			
Child A	82 (75.9)	60 (100.0)	22 (45.8)
Child B	14 (13.0)	0 (0.0)	14 (29.2)
Child C	12 (11.1)	0 (0.0)	12 (25.0)
Numbers of admission			
None	74 (68.5)	58 (96.7)	16 (33.3)
1 - 2	20 (18.5)	2 (3.3)	18 (37.5)
3 - 4	5 (4.6)	0 (0.0)	5 (10.4)
5 and above	9 (8.3)	0 (0.0)	9 (18.8)
Numbers of medication			
None	11 (10.2)	8 (13.3)	3 (6.3)
1 - 2	40 (37.0)	27 (45.0)	13 (27.1)
3 - 4	23 (21.3)	11 (18.3)	12 (25.0)
5 and above	34 (31.5)	14 (23.3)	20 (41.7)

a = Mean for total subjects was 59.8 ± 12.1 years (min = 19, max = 86), mean for compensated subjects was 64.3 ± 9.6 years (min= 34, max = 86), and mean for decompensated subjects was 54.4 ± 12.8 years (min = 19, max = 75).
b = Mean for total subjects was 24.9 ± 4.2 (min 16.6, max 36.5), mean for compensated subjects was 25.1 ± 4.1 (min 16.6, max 36.3), and mean for decompensated subjects was 24.6 ± 4.4 (min 17.8, max 36.5).

According to Table 2, overall prevalence of anxiety was 10.2% (13.3% in compensated cirrhosis and 6.3% in decompensated cirrhosis) and depression was 11.1% (11.7% in compensated cirrhosis and 10.4% in decompensated cirrhosis). By using AUDIT to identify severity of alcohol use disorder and SSQ to evaluate social support, most subjects were categorized as abstainers from alcohol (82.4%) and had fair to good social support (87.0%).

Table 2. Anxiety, depression and associated variables of participants (n = 108).

Variables	Total n = 108, n (%)	Compensated cirrhosis n = 60, n (%)	Decompensated cirrhosis n = 48, n (%)
Anxiety [a]			
No anxiety (< 8)	97 (89.8)	52 (86.7)	45 (93.8)
Anxiety (≥ 8)	11 (10.2)	8 (13.3)	3 (6.3)
Depression [b]			
No depression (< 8)	96 (88.9)	53 (88.3)	43 (89.6)
Depression (≥ 8)	12 (11.1)	7 (11.7)	5 (10.4)
Alcohol use			
Abstainers	89 (82.4)	49 (81.7)	40 (83.3)
Low risk	13 (12.0)	8 (13.3)	5 (10.4)
Hazardous	2 (1.9)	2 (3.3)	0 (0.0)
Possible dependence in one year	4 (3.7)	1 (1.7)	3 (6.3)
Level of social support			
Poor	14 (13.0)	9 (15.0)	5 (10.4)
Fair to good	94 (87.0)	51 (85.0)	43 (89.6)

a = Mean for total subjects was 3.8 ± 2.7 (min = 0, max = 11), mean for compensated subjects was 4.1 ± 2.7 (min = 0, max = 11), and mean for decompensated subjects was 3.3 ± 2.5 (min = 0, max = 11).
b = Mean for total subjects was 3.2 ± 2.9 (min = 0, max = 13), mean for compensated subjects was 3.3 ± 3.1 (min= 0, max = 13), and mean for decompensated subjects was 3.0 ± 2.7 (min = 0, max = 10).

Table 3 and Table 4 show factors associated with anxiety and depression. Regarding anxiety, factors associated with were sex ($\chi^2 = 6.2$, $P = 0.013$), numbers of physical symptoms ($P = 0.018$) and level of social support ($P = 0.035$). Similarly, in depression, factors associated with were sex ($\chi^2 = 4.4$, $P = 0.034$), numbers of physical symptoms ($P = 0.03$) and level of social support ($P = 0.035$). While there was no significant association with anxiety and depression in terms of age, marital status, level of education, occupation, underlying medical condition, BMI, type or etiology of cirrhosis, Child-Turcotte-Pugh classification or number of admissions.

Table 3. Factors associated with anxiety in all subjects (n = 108).

Variables	Having anxiety n = 11 (10.2%)	No anxiety n = 97 (89.8%)	P - value
Gender			
Male	9 (18.0)	41 (82.0)	0.013
Female	2 (3.4)	56 (96.6)	
Age (years)			
≤ 60	8 (15.1)	45 (84.9)	0.098
> 60	3 (5.5)	52 (94.5)	
Marital status			
Married	8 (11.8)	60 (88.2)	0.743[a]
Single/divorced/widow	3 (7.5)	37 (92.5)	
Education			
Below bachelor degree	6 (9.7)	56 (90.3)	0.839
Bachelor degree and above	5 (10.9)	41 (89.1)	
Occupation			
Employed	8 (12.7)	55 (87.3)	0.307
Unemployed/Retired	3 (6.7)	42 (93.3)	
Medical underlying disease			
Hypertension	6 (15.4)	33 (84.6)	0.199[a]
Diabetes mellitus	3 (12.0)	22 (88.0)	0.714[a]
Heart disease	2 (18.2)	9 (81.8)	0.311[a]
Vitamin D deficiency	2 (11.1)	16 (88.9)	1.0[a]
Numbers of physical symptoms			
0 - 2	5 (6.0)	78 (94.0)	0.018[a]
3 and above	6 (24.0)	19 (76.0)	
Body mass index			
Below average (< 18 kg/m²)	0 (0.0)	4 (100.0)	0.647
Average (18 - 25 kg/m²)	7 (12.3)	50 (87.7)	
Above average (> 25 kg/m²)	4 (8.5)	43 (91.5)	
Type of cirrhosis			
Compensated	8 (13.3)	52 (86.7)	0.227
Decompensated	3 (6.3)	45 (93.7)	
Cirrhotic etiology			
Hepatitis B virus	3 (9.1)	30 (90.9)	1.0[a]
Hepatitis C virus	6 (16.7)	30 (83.3)	0.175[a]
Autoimmune hepatitis	1 (5.0)	19 (95.0)	0.685[a]
Alcoholic hepatitis	2 (11.8)	15 (88.2)	0.683[a]
Child-Turcotte-Pugh score			
Child A	9 (11.0)	73 (89.0)	0.334
Child B	0 (0.0)	14 (100.0)	
Child C	2 (16.7)	10 (83.3)	
Numbers of admission			
0 - 2	10 (10.6)	84 (89.4)	1.0[a]
3 and above	1 (7.1)	13 (92.9)	
Numbers of medication			
0 - 2	3 (5.9)	48 (94.1)	0.162
3 and above	8 (14.0)	49 (86.0)	
Level of social support			
Poor	4 (28.6)	10 (71.4)	0.035[a]
Fair to good	7 (7.4)	87 (92.6)	

a = Fisher's Exact test

Table 4. Factors associated with depression in all subjects (n =108).

Variables	Having depression n = 12 (11.1%)	No depression n = 96 (88.9%)	P - value
Gender			
Male	9 (18.0)	41 (82.0)	0.034
Female	3 (5.2)	55 (94.8)	
Age			
≤ 60 years	8 (15.1)	45 (84.9)	0.196
> 60 years	4 (7.3)	51 (92.7)	
Marital status			
Married	4 (10.0)	60 (90.0)	1.0[a]
Single/divorced/widow	8 (11.8)	36 (88.2)	
Education			
Below bachelor degree	7 (11.3)	55 (88.7)	0.945
Bachelor degree and above	5 (10.9)	41 (89.1)	
Occupation			
Employed	7 (11.1)	56 (88.9)	1.0
Unemployed/Retired	5 (11.1)	40 (88.9)	
Medical underlying disease			
Hypertension	5 (12.8)	34 (34.7)	0.753[a]
Diabetes mellitus	3 (12.0)	22 (88.0)	1.0[a]
Heart disease	2 (18.2)	9 (81.8)	0.352[a]
Vitamin D deficiency	0 (0.0)	18 (100.0)	0.211[a]
Numbers of physical symptoms			
0 - 2	6 (7.2)	77 (92.8)	0.030[a]
3 and above	6 (24.0)	19 (76.0)	
Body mass index			
Below average (< 18 kg/m^2)	0 (0.0)	4 (100.0)	0.518
Average (18 - 25 kg/m^2)	8 (14.0)	49 (86.0)	
Above average (> 25 kg/m^2)	4 (8.5)	43 (91.5)	
Type of cirrhosis			
Compensated	7 (11.7)	53 (88.3)	0.837
Decompensated	5 (10.4)	43 (89.6)	
Cirrhotic etiology			
Hepatitis B virus	3 (9.1)	30 (90.9)	0.752[a]
Hepatitis C virus	7 (58.3)	29 (30.2)	0.1[a]
Autoimmune hepatitis	1 (8.3)	19 (19.8)	0.459[a]
Alcoholic hepatitis	2 (16.7)	15 (15.6)	1.0[a]
Child-Turcotte-Pugh score			
Child A	9 (11.0)	73 (89.0)	0.741
Child B	1 (7.1)	13 (92.9)	
Child C	2 (16.7)	10 (83.3)	
Numbers of admission			
0 - 2	10 (10.6)	84 (89.4)	0.653[a]
3 and above	2 (14.3)	12 (85.7)	
Numbers of medication			
0 - 2	3 (5.9)	48 (94.1)	0.102
3 and above	9 (15.8)	48 (84.2)	
Level of social support			
Poor	5 (35.7)	9 (64.3)	0.018[a]
Fair to good	7 (7.4)	87 (92.6)	

a = Fisher's Exact test

Table 5 shows predictors of having anxiety or depression among liver cirrhotic patients. Regarding anxiety, the predictors were being male (OR = 11.3, 95% CI = 1.8 - 70.7, P = 0.010), being compensated liver cirrhosis (OR = 5.9, 95% CI = 1.0 - 33.9, P = 0.045), having poor social support (OR = 3.9, 95% CI = 1.0 - 28.6, P = 0.047) and having three or more of physical symptoms (OR = 9.6, 95% CI = 1.8 - 50.1, P = 0.007). Regarding to depression, the predictors were being male (OR = 6.4, 95% CI = 1.3 - 32.1, P = 0.024), having poor social support (OR = 5.6, 95% CI = 1.2 - 24.8, P = 0.025) and having three or more of physical symptoms (OR = 5.2, 95% CI = 1.2 - 22.3, P = 0.026).

Analysis was adjusted for gender, age, marital status, education, income sufficiency, underlying disease, numbers of physical symptoms, body mass index, type of cirrhosis, cirrhotic etiology, Child-Turcotte-Pugh score, numbers of admission, numbers of medication, level of harm from alcohol use, level of social support.

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Discussion

We found that 10.2% and 11.1% of the patients with liver cirrhosis at outpatient clinic had anxiety and depression respectively. Our results were less than expected, however, compared to 41.0% of anxiety and 48.0% of depression in the study of Zhang AZ, et al.[7], and 18.0% of depression in the study of Buganza Torio E, et al.[14] This difference might be due to some explanations. Firstly, although Zhang AZ, et al. [7] used HADS for measuring anxiety and depression but they recruited both outpatient and inpatient subjects. The latter might enlarge the proportion of those psychiatric illnesses due to increased severity of liver condition. While our study recruited subjects only from the outpatient clinic, so the prevalence of those conditions should be less because of more stable liver condition. Secondly, although the recruited subjects only from the outpatient as our study, but Buganza Torio E, et al.[14], used MINI questionnaire to identify depression while we used Thai-HADS. The difference between types of questionnaires might affect threshold of detecting mental condition. Lastly, it was hypothesized that the less-than-expected prevalence might be due to the exclusion of active liver malignancy and the good social support of the majority in our study.

With regard to predictive factors, being male had higher rates of depression and anxiety. This was inconsistent with previous studies indicating that women were more likely to develop depressive and anxiety disorders than men.[15, 16] The difference could be explained with the meaning of having illness and role transition from independency to dependency in male that may have more effect than female.[17] Poor social support was also the predictive factors of anxiety and depression. Many researches indicated that patient with liver cirrhosis concerned about health conditions and the impact of their disease on social functioning and interaction [18, 19], which if they have low level of social support, they are at risk of suffering from their condition. Another finding was a greater

Table 5. Predictors of having anxiety or depression among liver cirrhotic patients analyzed   by binary logistic regression.

Variables	Wald	Df ratio	Odd	P - value	95% confidence interval	
					Lower	Upper
Anxiety						
Being male	6.657	1	11.251	0.010	1.789	70.749
Compensated cirrhosis	4.031	1	5.951	0.045	1.043	33.942
Poor social support	3.929	1	5.400	0.047	1.019	28.612
Having 3 or above of physical symptoms	7.153	1	9.572	0.007	1.829	50.102
Depression						
Being male	5.066	1	6.383	0.024	1.271	32.065
Poor social support	5.049	1	5.554	0.025	1.245	24.783
Having 3 or above of physical symptoms	4.939	1	5.206	0.026	1.215	22.307

number of physical symptoms, a higher rate of depression and anxiety which was consistent with Xu H, et al.[20] They found higher rate of depression and anxiety scores in patients who had many physical symptoms.[20, 21] Regarding predictive factors of anxiety, increased risk of anxiety among compensated cirrhosis compared to decompensated individuals were found. It was hypothesized that compensated individuals have not been adapted long enough to their medical condition compared to decompensated ones so they tended to be more anxious. Our study found the severity of cirrhosis as measured by Child-Pugh scores was not correlated to depression or anxiety, which was consistent with the finding of Ko FY, et al.[22] To the best of our knowledge, our study was the first report of the prevalence of depression and anxiety in liver cirrhosis in Thailand. However, the prevalence of anxiety and depression in general population of Thailand were 3.1% and 1.9% respectively.[23] We suggested that patients with liver cirrhosis were more likely to develop psychiatric problems than general population. The strength of our study was a moderate number of subjects covering all patients form the outpatient clinic and we used Thai-HADS questionnaire, to detect psychiatric condition, which is a standard test for hospital setting. Consequently, the results could be used for planning practically in our hospital setting. However, there were several limitations in our study that needed to be cautious in application. Firstly, as the study design was cross-sectional, we cannot directly evaluate the long-term impacts of psychological condition in patients with liver cirrhosis. Secondly, the psychiatric rating was used as a screening psychological distress and was not for diagnostic purposes so the diagnosis of anxiety and depressive disorder should be made by psychiatric specialist. Thirdly, this study excluded patients with severe liver conditions including hepatic encephalopathy, active liver malignancy and hospitalized patients so the results could not be applied in this population.

Conclusion

Anxiety and depression were approximately 10.0% in patients with liver cirrhosis in outpatient clinic. The predictive factors for those psychiatric conditions were being male, having poor social support and having a number of physical symptoms. In addition, compensated cirrhosis could be used to predict anxiety. The benefit of our study is to screen the risky population, especially in male, those who just has been diagnosed with cirrhosis and those with low psychosocial support in order to refer to psychiatrist for assessment and treatment. Further research is needed in hospitalized patients, and in other centers to confirm the results.

Conflict of interest

The authors, hereby, declare no conflict of interest.

References

1. D'Amico G, Morabito A, D'Amico M, Pasta L, Malizia G, Rebora P, et al. New concepts on the clinical course and stratification of compensated and decompensated cirrhosis. Hepatol Int 2018;12 Suppl 1:34-43.

2. Poovorawan K, Treeprasertsuk S, Thepsuthammarat K, Wilairatana P, Kitsahawong B, Phaosawasdi K. The burden of cirrhosis and impact of universal coverage public health care system in thailand: Nationwide study. Ann Hepatol 2015;14:862-8.

3. Forner A, Llovet JM, Bruix J. Hepatocellular carcinoma. Lancet 2012;379:1245-55.

4. Wong CCY, Warmoth K, Ivy S, Cheung B, Lu Q. Relation of social constraints on disclosure to adjustment among chinese american cancer survivors: A multiprocesses approach. Psychooncology 2018; 27:977-82.

5. Kagee A, Roomaney R, Knoll N. Psychosocial predictors of distress and depression among south african breast cancer patients. Psychooncology 2018; 27:908-14.

6. Henry A, Tourbah A, Camus G, Deschamps R, Mailhan L, Castex C, et al. Anxiety and depression in patients with multiple sclerosis: The mediating effects of perceived social support. Mult Scler Relat Disord 2019;27:46-51.

7. Zhang AZ, Wang QC, Huang KM, Huang JG, Zhou CH, Sun FQ, et al. Prevalence of depression and

anxiety in patients with chronic digestive system diseases: A multicenter epidemiological study. World J Gastroenterol 2016;22:9437-44.

8. Nilchaikovit T, Lotrakul M, Phisansuthideth U. Development of Thai version of hospital anxiety and depression scale in cancer patients. J Psychiatr Assoc Thai 1996;41:18-30.

9. Saunders JB, Aasland OG, Amundsen A, Grant M. Alcohol consumption and related problems among primary health care patients: WHO collaborative project on early detection of persons with harmful alcohol consumption—i. Addiction 1993;88:349-62.

10. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the alcohol use disorders identification test (audit): Who collaborative project on early detection of persons with harmful alcohol consumption-ii. Addiction 1993;88:791-804.

11. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG.. AUDIT: The Alcohol use disorders identification test: Guidelines for use in primary health care. 2nd ed. Geneva: World Health Organization;2001.

12. Schaefer C, Coyne JC, Lazarus RS. The health-related functions of social support. J Behav Med 1981;4: 381-406.

13. Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. J Med Assoc Thai 2007;90:2164-74.

14. Buganza -Torio E, Mitchell N, Abraldes JG, Thomas L, Ma M, Bailey RJ, et al. Depression in cirrhosis–a prospective evaluation of the prevalence, predictors and development of a screening nomogram. Aliment Pharmacol Ther 2019;49:194-201.

15. Popović DD, Ćulafić DM, Tepavčević DB, Kovačević NV, Špuran MM, Djuranović SP, et al. Assessment of depression and anxiety in patients with chronic liver disease. Vojnosanit Pregl 2015;72:414-20.

16. Perng CL, Shen CC, Hu LY, Yeh CM, Chen MH, Tsai CF, et al. Risk of depressive disorder following non-alcoholic cirrhosis: A nationwide population-based study. PLoS One 2014;9:e88721.

17. Vlassoff C. Gender differences in determinants and consequences of health and illness. J Health Popul Nutr 2007;25:47-61.

18. Valery PC, Clark PJ, McPhail SM, Rahman T, Hayward K, Martin J, et al. Exploratory study into the unmet supportive needs of people diagnosed with cirrhosis in queensland, australia. Intern Med J 2017;47: 429-35.

19. Valery PC, Powell E, Moses N, Volk ML, McPhail SM, Clark PJ, et al. Systematic review: Unmet supportive care needs in people diagnosed with chronic liver disease. BMJ Open. 2015;5:e007451.

20. Xu H, Zhou Y, Ko F, Ping J, Zhang J, Zhao C, et al. Female gender and gastrointestinal symptoms, not brain-derived neurotrophic factor, are associated with depression and anxiety in cirrhosis. Hepatol Res 2017;47:E64-e73.

21. Fritz E, Hammer J. Gastrointestinal symptoms in patients with liver cirrhosis are linked to impaired quality of life and psychological distress. Eur J Gastroenterol Hepatol 2009;21:460-5.

22. Ko FY, Yang AC, Tsai SJ, Zhou Y, Xu LM. Physiologic and laboratory correlates of depression, anxiety, and poor sleep in liver cirrhosis. BMC Gastroenterol 2013; 13:18.

23. Kittirattanapaiboon P, Tantirangsee N, Chutha W, Tantiaree A, Kwansanit P, Assanangkornchai S. et al. Prevalence of mental disorders and mental health problems: Results from Thai national mental health survey 2013. J Mental Health of Thailand 2017;25: 1-19.