
Relation between Caregivers Knowledge, Burden and Coping Strategies toward Elderly Patients with Liver Cirrhosis in Al-Rajhy Liver Hospital at Assiut University

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Abstract

Background: Caregivers for elderly patients with cirrhosis face huge burdens, and they use multiple coping strategies to adapt to these burdens. **Aim:** To assess relations between caregivers knowledge, burden, and coping strategies toward elderly patients with liver cirrhosis. **Design:** A descriptive research design was used. **Setting:** This study was conducted in the Liver Diseases Departments (male & female) in Al-Rajhy Liver Hospital at Assiut University. **Sample:** A convenience sample of 400 caregivers of elderly patients with liver cirrhosis. **Tools:** Structured interview questionnaire, knowledge questionnaire, zarit burden scale, and coping strategies inventory short-form. **Results:** The findings revealed that 34.7% of the caregivers were in the age group 40 - < 50 years, 52.8% were males and 75.8% of them were sons or daughters. 69.5% of them had poor knowledge regarding liver cirrhosis, 48.3% had a severe burden, and they mostly used problem-focused engagement as a coping strategy with burden. There was a statistically significant relation between caregiver's knowledge and their burden level, there was statistically positive correlation between knowledge and problem-focused engagement, and a negative correlation with problem-focused disengagement and emotion-focused disengagement coping strategies. **Conclusion:** The caregiver's poor knowledge has a negative effect on their burden, and most of them use problem-focused engagement and problem-focused disengagement coping strategies. **Recommendation:** Conduct an education and training program for caregivers regarding the care of elderly patients with liver cirrhosis.

Keywords: *Burden, Caregivers, Coping strategies, Elderly with liver cirrhosis & Knowledge.*

Introduction:

In Egypt, persons aged 60 and older are 6.8% of the total population. It is predicted that by 2052, that number will increase to 17.9% (Central Agency for Public Mobilization & Statistics 2022).

Liver cirrhosis is a chronic disease characterized by nodules in the liver that fibroses and regenerate, leading to portal hypertension and liver failure (Zhou et al., 2019). It accounts for 2.2% of fatalities and 1.5% of disability worldwide, making it the 11th major cause of mortality and the 15th leading cause of morbidity (Cheemerla & Balakrishnan, 2021).

Approximately 44.7% of the elderly population aged between 60 and 83 years suffered from liver cirrhosis in Al-Rajhy liver hospital at Assiut University (Abdullah et al., 2021). Elderly patients with liver cirrhosis experience serious complications such as ascites, hepatic encephalopathy, gastrointestinal tract bleeding from varices, skin problems, and hepatocellular carcinoma (Kamimura et al., 2019).

Patients with liver cirrhosis have poor quality of life, fewer options for everyday functioning, and a shorter lifespan without liver transplantation. Therefore, they frequently require a lot of help from

their informal caregivers, who are typically the spouse or a close relative, in addition to careful medical supervision (Shrestha et al., 2020).

Caregivers are known as the person or persons who are most closely involved in caring for elderly patients. They also help the patient manage his chronic illness while receiving treatment and care for most of his physical, psychological, emotional, social, and financial needs throughout the continuum of care, from hospitalization to home care, without receiving payment (Bell, 2020).

A caregiver's knowledge is the information, understanding, or skill that the caregiver gets from experience or education. Sufficient knowledge of caregivers regarding liver cirrhosis can play a significant role in reducing complications for patients. It also enables the caregivers to resolve difficulties in the process of caring for liver cirrhosis, thus contributing to increased feelings of personal accomplishment and reducing stress and burden (Saleh et al., 2021).

Caregiver's burden is defined as caregiver's perspective of their own physical and mental health, as well as their emotions, psychological state,

feeling of self, and social life, which may result from looking after their relatives (Ahmed et al., 2021). Caring for elderly patients may impact the caregiver's lives objectively and subjectively, including their physical, psychological, and emotional well-being, morale, work, economic situation, social life, relationships, and sexual activity. Liver cirrhosis can lead to increasing caregiver's burden and stress. Therefore, these caregivers might experience substantial levels of burden. This burden may negatively impact the caregivers' health, social life, and general well-being (Opara & Brola, 2018).

The coping strategies refer to behaviors, thoughts, and emotions that people employ to overcome difficult situations and adjust to existing circumstances. People use many coping strategies, and some may prove more effective than others, depending on the nature of the stressful situation and the person who is employing them (Janghel & Shrivastav, 2017).

Gerontological nurses can provide understandable information to the caregivers about the required care of the elderly patients in a variety of ways, necessary services as well as provide them with the necessary guidance, which increases their self-esteem, reduce their stress which in turn decrease the burden facing them (Cooper, 2021). Gerontological nurse also helps the family to adapt to a new situation, maintaining and strengthening the family caregivers to adapt to existing changes (Schumacher et al., 2019).

Significance of the study:

The prevalence of liver cirrhosis was 44.7% of total chronic liver disease among elderly patients admitted at Al-Rajhy Liver Hospital (Abdullah et al., 2021).

Patients with liver cirrhosis require extensive care; many are unable to drive to their medical appointments, and up to one-third have difficulty performing their daily activities due to frailty and cognitive impairment. Therefore, a typical patient with liver cirrhosis needs 9 hours of informal care per week from friends and family. This places a significant burden on these caregivers, lowering their quality of life and raising their anxiety and depression levels (Volk, 2020).

Therefore, the assessment of the knowledge, burden, and coping strategies of caregivers caring for the elderly with liver cirrhosis is very important.

Aim of the study:

The current study aimed to assess the relation between caregivers' knowledge, burden, and coping strategies toward elderly patients with liver cirrhosis.

Research questions:

To fulfill the aim of the present study, the following questions are formulated:

- Q1. What is the knowledge level of caregivers of elderly patients regarding liver cirrhosis?
- Q2. What is the burden level of caregivers of elderly patients with liver cirrhosis?
- Q3. Which types of coping strategies are mostly used by caregivers of the elderly with liver cirrhosis?
- Q4. What is the relation between caregivers' knowledge, burden, and coping strategies toward elderly patients with liver cirrhosis?

Subjects and Methods

Research design:

A descriptive research design was used in this study.

Setting:

This study was conducted in the Liver Diseases Departments (male & female) in Al-Rajhy Liver Hospital at Assiut University, which provide services for patients with liver diseases for all Upper Egypt.

Sample:

A convenience sample of caregivers of elderly patients with liver cirrhosis who were admitted to Al-Rajhy Liver Hospital at Assiut University over the duration of six months, and the total number of caregivers was 400 male and female.

Sample size:

The total number of elderly patients with liver cirrhosis (≥ 60 -year old) admitted to Al-Rajhy Liver Hospital at Assiut University was about 2645 patients per year. The estimated sample size was 400 elderly patients aged ≥ 60 -year-old calculating by using EPI /Info software, version 3, 3 with 97% confidence interval (CI).

Inclusion criteria for caregivers:

- Responsible for providing care for the elderly patients with liver cirrhosis.
- Able to communicate
- Free of any disabilities or serious health problems.
- Unpaid caregivers

Data Collection Tools: Four tools were used and filled by the researchers for collecting data for this study:

Tool I: Structured Interview Questionnaire: It was developed by the researchers and included two parts as the following.

Part I: Data about elderly patients, it includes:

1. Demographic characteristics: age, gender, marital status, level of education, occupation, and family type.
2. Past history: history of chronic diseases such as (heart disease, hepatitis, chronic obstructive pulmonary disease, diabetes mellitus, hypertension, and cancer), history of

hospitalization for liver cirrhosis, number of hospitalization for liver cirrhosis and last time of hospitalization).

- Clinical data of disease: stage, duration, signs & symptoms, complications of liver cirrhosis

Part II: Data about elderly's caregiver includes:

- Personal characteristics: age, gender, marital status, level of education, occupation, relation to the elderly, living with the elderly patient or not.
- Medical history: cardiovascular diseases, hypertension and diabetes mellitus.

Tool II: Knowledge questionnaire:

It was developed by (Taha et al., 2014) to assess the knowledge of the caregivers of elderly patients about liver cirrhosis. It included questions about the definition of liver cirrhosis (1 item), stages of liver cirrhosis (2 items), causes of liver cirrhosis (3 items), mode of transmission of hepatitis C (5 items), mode of transmission of hepatitis B (6 items), signs and symptoms (15 items), medications (6 items), contraindicated medications (3 items), proper nutrition (10 items), prevention (3 items), complications (7 items), symptoms should be reported to the doctor (8 items).

Scoring system for knowledge:

Total grades of knowledge were (69); one point was given for each correct response, and zero was given for each incorrect response and don't know. The total score was determined by adding the points together and then translated to a percentage score as follows:

- Less than 50% poor knowledge.
- 50% to 70% fair knowledge.
- More than 70% good knowledge (Mobed et al., 2019).

Tool validity and reliability

The reliability coefficient by Cronbach's alpha = 0.827). The validity of the scale was found by content validity (Taha et al., 2014).

Tool III: Zarit Burden Interview Questionnaire (Zarit, 2000):

It was developed to measure the caregiver's perceived burden of providing family care. It's composed of 22 items in 5-point likert scale, ranging from 0 = 'never' to 4 = 'nearly always'. Item scores are added up to give a total score ranging from 0 to 88, with higher scores indicating greater burden. The questions focus on major areas such as caregiver's health, psychological well-being, finances, social life and the relationship between the caregiver and the patient.

Scoring system:

- Little or no burden = 0 to 20
- Mild to moderate burden = 21 to 40
- Moderate to severe burden = 41 to 60
- Severe burden = 61 to 88.

Tool validity and reliability

The reliability coefficient by Cronbach's alpha = 0.93. The intra-class correlation for the test-retest reliability, was 0.89. The validity of the scale was found by construct validity (differences in ZBI scores among subgroups of caregivers who differed in the caregiving role, intensity, duration, and degree of financial problems were examined to assess known groups) (Yap, 2010).

IV: Coping Strategies Inventory Short Form (CSI-SF) (Addison et al., 2007):

It was developed to evaluate coping strategies used in the face of stressful situations. It consists of 16 items using a five-point likert scale ranging from 1 = "Never", 2 = "Seldom", 3 = "Sometimes", 4 = "Often" and 5 = "Almost Always" Each items distributed on 4 subscales; problem-focused engagement, problem-focused disengagement, emotion-focused engagement, and emotion-focused disengagement and each of which had four items.

The CSI SF was structured to four subscales

- Problem-Focused Engagement (1, 2, 8, & 9):** It comprises problem solving and cognitive restructuring subscales, which involve cognitive and behavioral methods to change the circumstance or modify the meaning of the situation for the individual. These coping strategies are directed at the stressful event.
- Problem-Focused Disengagement (4, 7, 12, & 14):** This encompasses both avoidance and wishful thinking. The things demonstrate denial, avoidance, and an incapacity or reluctance to look at the problem differently. They reflect the cognitive and behavioral methods used to avoid the problem.
- Emotion-Focused Engagement (5, 6, 11, & 13):** incorporates both social support and expressing feelings. These coping strategies are centered on the person's emotional reaction to the stressful situation.
- Emotion-Focused Disengagement (3, 10, 15, & 16):** consist of social isolation and self-criticism. It entails isolating oneself and one's feelings from others, as well as criticizing or blaming oneself for what has occurred.

Scoring system:

Caregivers receive a score for each subscale that ranges from 4 – 20 then the mean \pm SD measured for each subscale.

Validity and Reliability

The reliability coefficient by Cronbach's alpha = 0.80. The validity of the scale was found by construct and criterion validity through several studies (Singh & Mathur, 2020).

Patients and methods:

Preparatory stage: A formal letter of approval to conduct the study was obtained from the dean of the faculty of nursing and given to the director of Al-

Rajhy Liver Hospital at Assiut University. Permission to conduct the study was granted in the letter, which also outlines the study's objectives and methods.

Pilot study

A pilot study was conducted before data collecting began on 20 caregivers who were not included in the study. The necessary adjustments based on the pilot study results and the questionnaire were reconstructed for ready use. This was done to test the tools' clarity and determine the time needed to complete it.

Ethical considerations:

The faculty of nursing ethical committee gave its approval to the research proposal, and there was no risk to the caregivers being researched when the study was being conducted. The study followed the common ethical principles in clinical research, and caregiver's oral agreement was obtained after they had been informed of the study's nature and objectives. They were informed that they had the right to refuse participation in the study at any time and that they could withdraw from it at any time without providing a reason. The privacy of study participants was taken into account when data was collected.

Fieldwork:

The researchers began collecting data from the first of September 2022 to the last of February 2023, three

days a week. After receiving permission to perform the study, the researchers went to the in-patient ward and selected all of the patients' family caregivers from the previously mentioned hospital setting. Afterward, the researchers contacted the caregivers to assess their eligibility and give details about the purpose of the study. The interview occurred in the in-patient ward or the hallway in the previously mentioned hospital setting. It took between 20 and 30 minutes to complete the questionnaire for each interview. Caregivers were given structured guidelines at the end of the session to help them lessen stress and improve their knowledge. Five to six interviews are conducted daily in the morning and afternoon shifts.

Statically analysis:

Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Science). Data were presented as number, percentage, mean, and standard deviation. Chi-square test was used to compare between qualitative variables. Independent samples t-test was used to compare quantitative variables between two groups and ANOVA test was used for more than two groups. Pearson correlation was done to measure correlation between quantitative variables. P-value considered statistically significant when $P < 0.05$.

Results

Table (1): Distribution of elderly patients with liver cirrhosis according to their personal characteristics in Al-Rajhy Liver Hospital at Assiut University (N=400).

Personal characteristics of elderly patients	No. (400)	%
Age: (years)		
60 - < 65	105	26.2%
65 - 70	177	44.3%
> 70	118	29.5%
Mean \pm SD (Range)	68.07 \pm 5.37	(61.0-89.0)
Gender:		
Male	254	63.5%
Female	146	36.5%
Marital status:		
Married	230	57.5%
Widow	167	41.7%
Divorced	3	0.8%
Level of education:		
Illiterate	216	54.0%
Read and write	59	14.8%
Basic education	34	8.5%
Secondary	12	3.0%
University	79	19.7%
Occupation:		
Technical worker	10	2.5%
Farmer	130	32.5%
Private work	77	19.3%
Housewife	109	27.2%
Retired	74	18.5%
Family type:		
Nuclear	279	69.8%
Extended	121	30.2%

Table (2): Distribution of elderly patients with liver cirrhosis according to their past health history in Al-Rajhy Liver Hospital at Assiut University (N=400).

Past health history	No. (400)	%
Comorbidities with liver cirrhosis:		
Yes	246	61.5%
No	154	38.5%
Type of Comorbidities: ≠		
Heart disease	70	28.5%
Hepatitis	31	12.6%
Chronic obstructive pulmonary disease	9	3.7%
Diabetes mellitus	152	61.8%
Hypertension	58	23.6%
Cancer	4	1.6%
History of hospitalization for liver cirrhosis:		
Yes	373	93.3%
No	27	6.7%
Number of hospitalization for liver cirrhosis:		
One time	18	4.8%
Two times	72	19.3%
Three times	188	50.4%
More than three times	95	25.5%
Last time of hospitalization:		
Less than one month	41	11.0%
One month	114	30.5%
Two months	154	41.3%
More than 2 months	64	17.2%

≠ More than one answer

Table (3): Distribution of elderly patients with liver cirrhosis according to their clinical data of disease in Al-Rajhy Liver Hospital at Assiut University (N=400).

Clinical data of disease	No. (400)	%
Stages of liver cirrhosis:		
Compensated cirrhosis	22	5.5%
Decompensated cirrhosis	378	94.5%
Duration of liver cirrhosis:		
One year	91	22.8%
Two years	194	48.5%
More than two years	115	28.7%
Signs and symptoms: ≠		
Abdominal pain	308	77.0%
Fatigue and weakness	287	71.8%
Jaundice	240	60.0%
Hematemesis	234	58.5%
Weight loss	229	57.3%
Peripheral edema	194	48.5%
Rectal bleeding	120	30.0%
Fever	107	26.8%
Gum and nose bleeding	84	21.0%
Shortness of breath	69	17.3%
Anorexia	69	17.3%
Decrease mental function	52	13.0%
Palmer erythema	5	1.3%
Complications: ≠		
Variceal bleeding	236	59.0%
Ascites	193	48.3%
Hepatic encephalopathy	161	40.3%
Hypo/ hyperglycemia	120	30.0%
Hypertension	83	20.8%
Peritonitis	35	8.8%
Hepatocellular carcinoma	10	2.5%

≠ More than one answer

Table (4): Distribution of caregivers according to their personal characteristics in Al-Rajhy Liver Hospital at Assiut University (N=400).

Personal characteristics of caregivers	No. (400)	%
Age: (years)		
20 - < 30	88	22.0
30 - < 40	139	34.7
40 - < 50	100	25.0
≥ 50	73	18.3
Mean ± SD (Range)	38.70 ± 10.78 (20.0-69.0)	
Gender:		
Male	211	52.8%
Female	189	47.2%
Marital status:		
Single	87	21.6%
Married	293	73.3%
Widow	11	2.8%
Divorced	9	2.3%
Level of education:		
Illiterate	77	19.3%
Read and write	40	10.0%
Basic education	38	9.5%
Secondary	65	16.2%
University	180	45.0%
Occupation:		
Employee	81	20.2%
Farmer	24	6.0%
Private work	151	37.8%
Housewife	125	31.2%
Retired	4	1.0%
Student	15	3.8%
Relation to the patient:		
Sons and daughters	303	75.8%
Wife	59	14.7%
Brother/ sister	29	7.2%
Daughter-in-law	6	1.5%
Husband	3	.8%
Living with the elderly patient:		
Yes	276	69.0%
No	124	31.0%

≠ More than one answer

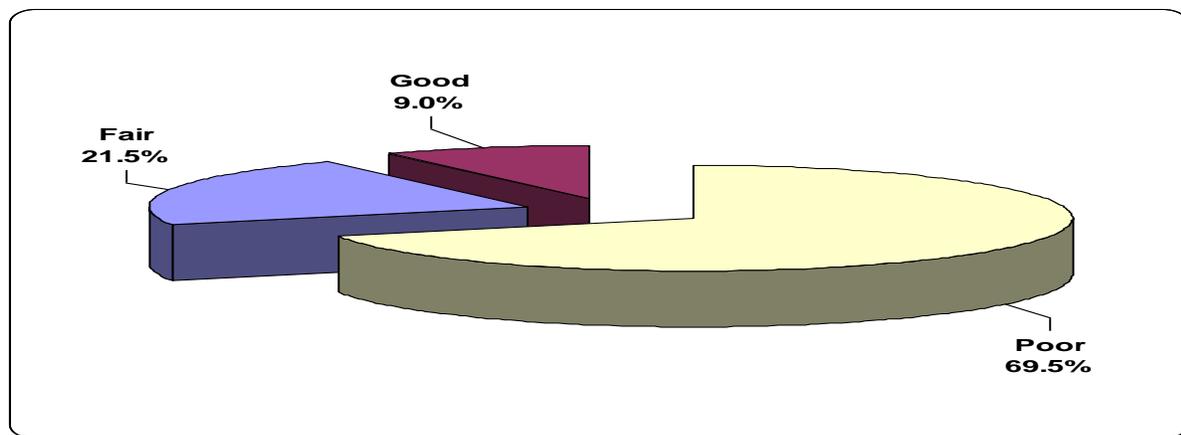


Figure (1): Distribution of caregivers' knowledge level regarding liver cirrhosis in Al-Rajhy Liver Hospital at Assiut University.

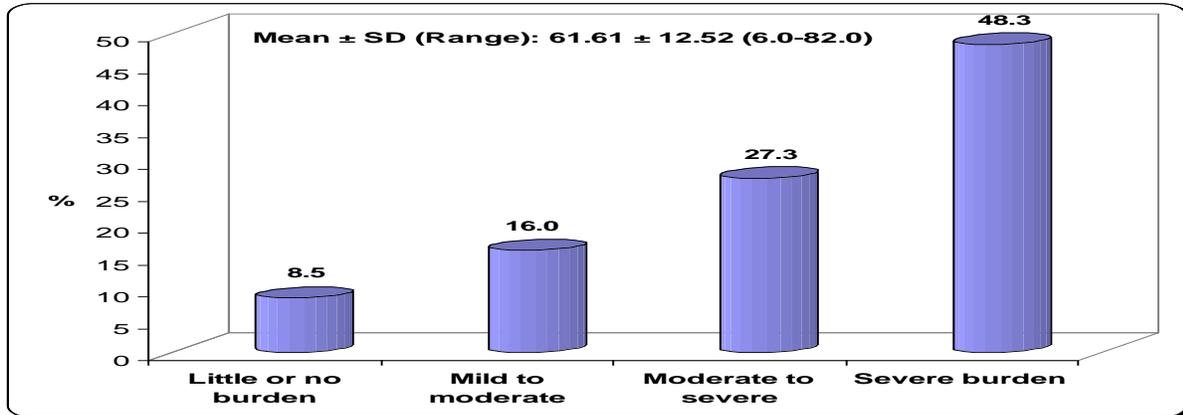


Figure (2): Distribution of caregivers' burden level in Al-Rajhy Liver Hospital at Assiut University.

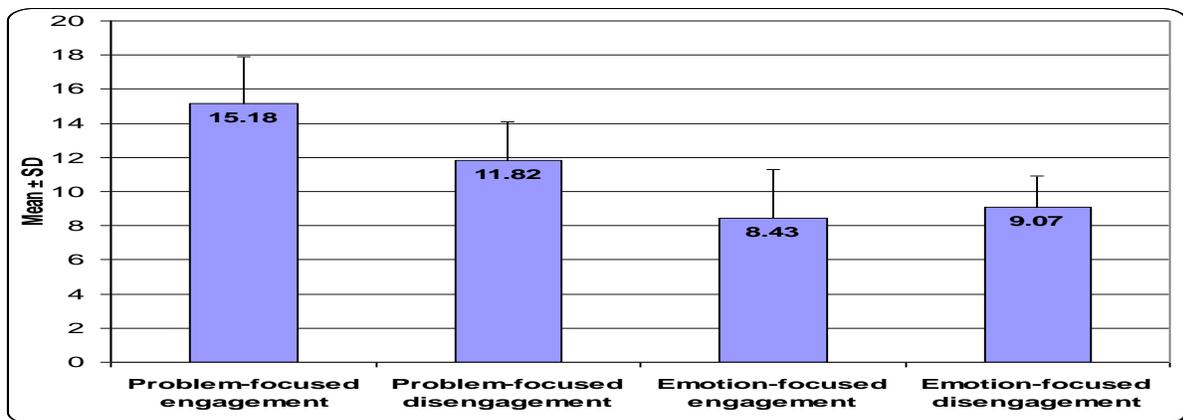


Figure (3): Distribution of caregiver's coping strategies in Al-Rajhy Liver Hospital at Assiut University

Table (5): Relation between knowledge and burden level of the caregivers in Al-Rajhy Liver Hospital at Assiut University (N=400).

Knowledge	Burden level								P-value
	Little or no burden		Mild to moderate		Moderate to severe		Severe burden		
	No.	%	No.	%	No.	%	No.	%	
Poor (n= 278)	14	5.0%	40	14.4%	78	28.1%	146	52.5%	0.000*
Fair (n= 86)	7	8.1%	13	15.2%	24	27.9%	42	48.8%	
Good (n= 36)	13	36.1%	11	30.6%	7	19.4%	5	13.9%	

Chi-square test

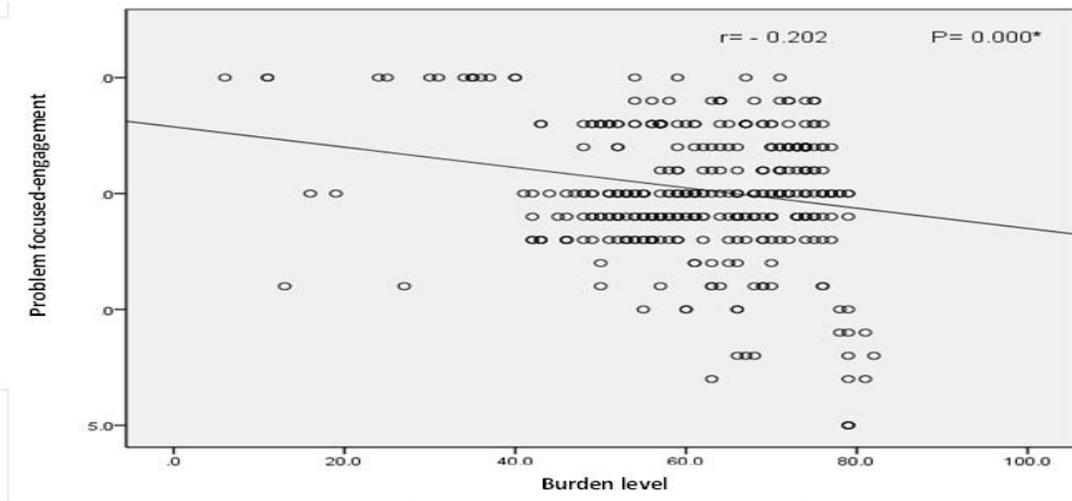
* Statistical significance at $p \leq 0.05$

Table (6): Correlation between caregiver's knowledge level and coping strategies in Al-Rajhy Liver Hospital at Assiut University (N=400).

Coping strategies	Knowledge level	
Problem-focused engagement	R-value	0.172
	P-value	0.001*
Problem-focused disengagement	R-value	-0.121
	P-value	0.016*
Emotion-focused engagement	R-value	0.028
	P-value	0.573
Emotion-focused disengagement	R-value	-0.107
	P-value	0.032*

Pearson correlation

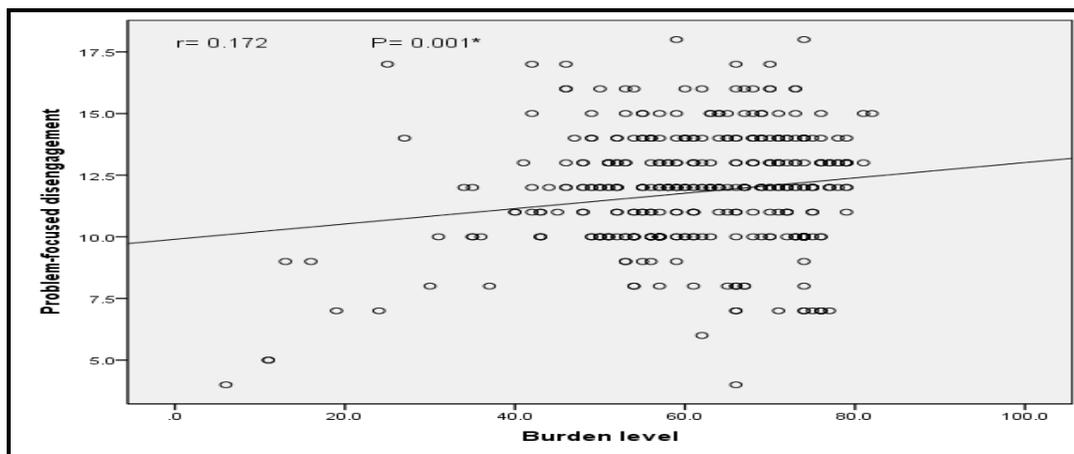
* Statistical significance at $p < 0.05$



Pearson correlation

* Statistical significance at $p < 0.05$

Figure (4): Correlation between caregiver's burden level and problem-focused engagement coping strategy



Pearson correlation

* Statistical significance at $p \leq 0.05$

Figure (5): Correlation between caregiver's burden level and problem-focused disengagement coping strategy

Table (7): Relation between caregiver's burden level and elderly patient's personal characteristics in Al-Rajhy Liver Hospital at Assiut University (N=400).

Personal characteristics of elderly patients	Burden level of caregivers								P-value
	Little or no burden (n=34)		Mild to moderate (n=64)		Moderate to severe (n=109)		Severe Burden (n=193)		
	No.	%	No.	%	No.	%	No.	%	
Age: (years)									
60 - < 65	7	20.6	20	31.2	32	29.4	46	23.8	0.057
65 - 70	19	55.9	20	31.3	40	36.7	49	25.4	
> 70	8	23.5	24	37.5	37	33.9	98	50.8	
Gender:									
Male	21	61.8	39	60.9	66	60.6	128	66.3	0.730
Female	13	38.2	25	39.1	43	39.4	65	33.7	
Marital status:									
Married	23	67.6	37	57.8	57	52.3	113	58.5	0.435
Not married	11	32.4	27	42.2	52	47.7	80	41.5	

Personal characteristics of elderly patients	Burden level of caregivers								P-value
	Little or no burden (n=34)		Mild to moderate (n=64)		Moderate to severe (n=109)		Severe Burden (n=193)		
	No.	%	No.	%	No.	%	No.	%	
Level of education:									
Illiterate/ Read & write	23	67.6	41	64.1	81	74.3	130	67.4	0.234
Basic education	2	5.9	8	12.5	3	2.8	21	10.9	
Secondary/ University	9	26.5	15	23.4	25	22.9	42	21.7	
History of comorbidities with liver cirrhosis:									
Yes	9	26.5	36	56.3	89	81.7	112	58.0	0.000*
No	25	73.5	28	43.8	20	18.3	81	42.0	
History of hospitalization for liver cirrhosis:									
Yes	31	91.2	60	93.7	105	96.3	177	91.7	0.453
No	3	8.8	4	6.3	4	3.7	16	8.3	
Number of hospitalization for liver cirrhosis:									
1 – 2 times	11	35.5	15	25.0	22	21.0	42	23.7	0.637
3 times	11	35.5	32	53.3	56	53.3	89	50.3	
More than 3 times	9	29.0	13	21.7	27	25.7	46	26.0	
Stages of liver cirrhosis:									
Compensated cirrhosis	5	14.7	4	6.2	3	2.8	10	5.2	0.065
Decompensated cirrhosis	29	85.3	60	93.8	106	97.2	183	94.8	
Duration of liver cirrhosis:									
One year	7	20.6	10	15.6	23	21.1	98	50.8	0.039*
Two years	11	32.4	36	56.3	49	45.0	51	26.4	
More than two years	16	47.0	18	28.1	37	33.9	44	22.8	

Chi-square test

* Statistical significance at $p \leq 0.05$

Table (8): Relation between caregiver's coping strategies and elderly patient's personal characteristics in Al-Rajhy Liver Hospital at Assiut University (N=400).

personal characteristics of elderly patients	Coping strategies of caregivers			
	Problem-focused engagement	Problem-focused disengagement	Emotion-focused engagement	Emotion- focused disengagement
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Age: (years)				
60 - < 65	14.76 \pm 2.76	12.28 \pm 1.95	8.37 \pm 2.94	9.11 \pm 2.00
65 – 70	15.22 \pm 2.98	11.61 \pm 2.46	8.62 \pm 2.87	8.99 \pm 1.90
> 70	15.47 \pm 2.17	11.72 \pm 2.18	8.20 \pm 2.81	9.15 \pm 1.49
P-value	0.140	0.050	0.469	0.737
Gender:				
Male	15.04 \pm 2.59	12.04 \pm 2.32	8.32 \pm 2.82	9.15 \pm 1.93
Female	15.40 \pm 2.91	11.42 \pm 2.14	8.62 \pm 2.95	8.95 \pm 1.60
P-value	0.201	0.008*	0.308	0.289
Marital status:				
Married	15.30 \pm 3.10	11.59 \pm 2.31	8.90 \pm 2.80	9.06 \pm 1.88
Not married	15.01 \pm 2.07	12.13 \pm 2.18	7.79 \pm 2.85	9.09 \pm 1.74
P-value	0.301	0.019*	0.000*	0.838
Level of education:				
Illiterate/ Read & write	15.24 \pm 2.80	12.60 \pm 1.66	8.58 \pm 2.83	9.09 \pm 1.81
Basic education	15.68 \pm 3.67	11.41 \pm 2.40	10.44 \pm 2.90	8.91 \pm 2.68
Secondary/ University	14.80 \pm 1.90	11.61 \pm 2.37	7.23 \pm 2.46	9.09 \pm 1.43
P-value	0.221	0.001*	0.000*	0.865
History of comorbidities:				
Yes	14.96 \pm 2.70	11.72 \pm 2.30	8.48 \pm 2.95	9.07 \pm 1.74
No	15.51 \pm 2.70	11.97 \pm 2.22	8.34 \pm 2.74	9.08 \pm 1.94
P-value	0.048*	0.275	0.637	0.962
History of hospitalization for liver cirrhosis				
Yes	15.21 \pm 2.66	13.26 \pm 2.19	8.40 \pm 2.84	9.03 \pm 1.78
No	14.63 \pm 3.33	11.71 \pm 2.24	8.89 \pm 3.29	9.63 \pm 2.20
P-value	0.280	0.001*	0.390	0.099

personal characteristics of elderly patients	Coping strategies of caregivers			
	Problem-focused engagement	Problem-focused disengagement	Emotion-focused engagement	Emotion- focused disengagement
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Number of hospitalization for liver cirrhosis				
1 – 2 times	15.48 \pm 3.14	11.48 \pm 2.41	8.79 \pm 2.64	9.25 \pm 2.25
3 times	15.21 \pm 2.02	11.33 \pm 2.07	9.21 \pm 3.05	9.12 \pm 1.28
More than 3 times	14.97 \pm 3.24	12.01 \pm 2.20	7.80 \pm 2.70	8.61 \pm 2.06
P-value	0.430	0.031*	0.000*	0.030*
Stages of liver cirrhosis:				
Compensated cirrhosis	14.68 \pm 3.54	11.45 \pm 2.74	9.23 \pm 2.86	9.00 \pm 1.11
Decompensated cirrhosis	15.20 \pm 2.66	11.84 \pm 2.24	8.38 \pm 2.87	9.08 \pm 1.85
P-value	0.381	0.441	0.181	0.848
Duration of liver cirrhosis:				
One year	15.48 \pm 2.82	11.90 \pm 2.20	9.08 \pm 2.85	9.07 \pm 1.91
Two years	15.24 \pm 2.18	11.93 \pm 2.14	8.11 \pm 2.76	9.07 \pm 1.66
More than two years	14.82 \pm 3.34	11.56 \pm 2.52	8.46 \pm 3.00	9.08 \pm 2.03
P-value	0.193	0.342	0.029*	0.001*

Independent samples t-test

ANOVA test

* Statistical significance at $p \leq 0.05$

Table (1): Shows the distribution of elderly patients with liver cirrhosis according to their personal characteristics. It was observed that 44.3% of the elderly patients were in the age group ranged (from 65- 70) years, 63.5% were males, 57.5% were married, and 54.0% of them were illiterate. 32.5% of the elderly patients were farmers, and 69.8% of them lived with nuclear families.

Table (2): Shows the distribution of elderly patients with liver cirrhosis according to their past health history. It was found that 61.5% of elderly patients had comorbidities with liver cirrhosis, with the most prevalent comorbidity being diabetes mellitus (61.8%) followed by heart disease (28.5%). Regarding history of hospitalization for liver cirrhosis, it was observed that 93.3% of the elderly patients had a history of hospitalization for liver cirrhosis, 50.4% were hospitalized three times and 41.3% of them hospitalized two months ago.

Table (3): Reveals the distribution of elderly patients with liver cirrhosis according to their clinical data. It was observed that 94.5% of the elderly patients had decompensated liver cirrhosis, 48.5% had liver cirrhosis from 2 years ago, 77.0% complained of abdominal pain, and 71.8% of them complained of fatigue and weakness. Concerning complications of liver cirrhosis, about 59.0% of the elderly patients had variceal bleeding.

Table (4): Presents the distribution of caregivers according to their personal characteristics. It was observed that 34.7 of the caregivers aged from 30 to < 40 years, 52.8% were males, 73.3% were married, and 45.0% of them had a university education. 37.8% of the caregivers had private work, 75.8% of the caregivers were sons and daughters, and 69.0% of them were living with patients.

Fig. (1): Shows the distribution of caregiver's knowledge level regarding liver cirrhosis. It was

observed that 69.5% of caregivers had a poor knowledge level, 21.5% had a fair knowledge level, and only 9% had a good knowledge level.

Fig. (2): Illustrates the distribution of caregiver's burden level. It was observed that 48.3% of caregivers had a severe burden regarding liver cirrhosis, 27.3% had a moderate to severe burden, 16.0% had a mild to moderate burden, and 8.5% had little or no burden.

Fig. (3): Shows the distribution of caregiver's coping strategies. It was found that the caregivers used the problem-focused engagement coping strategy more than other coping strategies, with a mean \pm SD of (15.18 \pm 2.71), followed by problem-focused disengagement (11.82 \pm 2.27).

Table (5): Shows the relation between knowledge and burden level of the caregivers. It was noted that the caregivers burden was statistically significantly higher among those who had poor knowledge regarding liver cirrhosis at a p-value of 0.000*.

Table (6): Reveals the correlation between caregiver's knowledge level and coping strategies. It was observed that there was a significant positive correlation between knowledge level and problem-focused engagement ($r = 0.172$, $p 0.001^*$), a significant negative correlation between knowledge level and problem-focused disengagement ($r = -0.121$, $p 0.016^*$), and emotion-focused disengagement ($r = -0.107$, $p 0.032^*$).

Fig. (4): Clarifies the correlation between caregiver's burden level and problem-focused engagement coping strategy. It was observed that there was a significant negative correlation between burden level and problem-focused engagement coping strategy ($r = -0.202$, $p 0.000^*$).

Fig. (5): Illustrates the correlation between the caregiver's burden level and the problem-focused disengagement coping strategy. It was found that

there was a significant positive correlation between caregiver burden level and problem-focused disengagement coping strategy ($r = 0.172$, $p = 0.001^*$).

Table (7): Shows the relation between caregiver's burden level and elderly patient's personal characteristics. It was observed that the caregiver burden was statistically significantly higher among those whose patients had comorbidities associated with liver cirrhosis and had liver cirrhosis from one year (p values of 0.000^* and 0.039^* , respectively).

Table (8): Illustrates the relation between caregiver's coping strategies and elderly patient's personal characteristics. It was found that problem-focused engagement coping strategy was statistically significantly higher among caregivers whose patients didn't have comorbidities. And the problem-focused disengagement coping strategy were statistically significantly higher among caregivers whose patients were male, not married, illiterate or read and write, hospitalized for liver cirrhosis before, and those who hospitalized more than 3 times for liver cirrhosis (p -values 0.008^* , 0.019^* , 0.001^* , 0.001^* , and 0.031^*), respectively.

Also, emotion-focused engagement coping strategy were statistically significantly higher among caregivers whose patients were married, had basic education, were hospitalized three times, and had liver cirrhosis for one year (p -values 0.000^* , 0.000^* , 0.000^* , and 0.029^*), respectively. And emotion-focused disengagement coping strategy were statistically significantly higher among caregivers whose patients were hospitalized one or two times and had liver cirrhosis for more than two years at p -values of 0.030^* and 0.001^* , respectively

Discussion

Liver cirrhosis poses the greatest burden on elderly patients as well as their caregivers, so they try to adapt to these burdens using multiple coping strategies (Volk, 2020). Therefore, the present study aimed to assess the relation between caregivers knowledge, burden, and coping strategies toward elderly patients with liver cirrhosis.

Regarding the personal characteristics of the elderly patients with liver cirrhosis found in table (1), the current study found that the mean age of the elderly patients was 68.07 ± 5.37 . The result is in line with Awadallah et al., (2020), who reported that the mean age of the most affected patients was 68.52 ± 2.92 .

The current findings showed that liver cirrhosis is more common in males than females, as nearly two-thirds of elderly patients with liver cirrhosis were males. This finding is consistent with Awadallah et al., (2020) & Kok et al., (2020), who reported that nearly two-thirds of elderly patients with liver cirrhosis were male.

In relation to the past health history of the elderly patient with liver cirrhosis found in table (2), the current study revealed that about three-fifths of elderly patients had other comorbidities. These results are supported by Abdelmaksoud et al., (2016), who stated that nearly half of the studied samples had diabetes mellitus and hypertension.

Regarding the clinical data of the elderly patients with liver cirrhosis found in table (3), the current study revealed that the majority of the patients had decompensated liver cirrhosis. These results are supported by Aby et al., (2021), who reported that most patients had decompensated cirrhosis. This might be due to the fact that liver cirrhosis is frequently asymptomatic and found by accident or until the patient has complications.

Regarding the personal characteristics of caregivers found in table (4), the current study revealed that the mean age of the caregivers was 38.70 ± 10.78 years. These results matched those of Mankulangara & Ramachandran, (2017), who stated that the mean age of caregivers in ALD was 39 ± 7.6 years.

The current study found that males constituted more than half of caregivers. These results are confirmed by Mohamed et al., (2021), who stated that females constituted more than half of the study sample.

While these results are contrary to the study by Woodrell et al., (2021), who found that women constitute the majority of caregivers, This finding can be explained by the fact that men are typically obliged to perform numerous caring duties, including spending time with patients who are older adults and working outside the home to support their families

The current findings showed that nearly three-quarters of the caregivers were married. These results are validated by Sabzwari et al., (2016), who stated that three-quarters of caregivers were married and one-quarter were unmarried. On the other hand, the result of the current study disagrees with Alshammari et al., (2017), who revealed that nearly three-fifths were single.

The current study found that nearly half of the caregivers had a university education. These findings are reinforced by Saleh et al., (2022), who reported that about fifty percent of caregivers were college graduates. However, the results of the current study disagree with Hareendran et al., (2020), whose research found that nearly half of the studied samples were from secondary education.

The current study revealed that three-quarters of the studied caregivers were sons or daughters. This result was in line with Sayed et al., (2020), who discovered that sons or daughters made up more than half of the caregivers.

The present findings also disagree with **Hareendran et al., (2020)**, who found that spouses were the majority caregivers.

Regarding living with the patients, the current study revealed that more than two-thirds of the caregivers were living with elderly patients. These results are supported by **Yigitalp et al., (2017)**, who stated that most of the studied caregivers were living with patients.

Regarding the caregivers' knowledge level regarding liver cirrhosis found in figure (1), the current study revealed that more than two-thirds of the caregivers had poor knowledge and one-fifth had fair knowledge. These findings differ from those of **Hassan et al., (2019)**, who stated that only one-third of caregivers had poor knowledge and nearly two-fifths of them had good knowledge. This result might be due to the fact that most caregivers were male, preoccupied with their personal lives, had work outside the home most of the time, and had other responsibilities in their lives that kept them busy.

As regards the caregivers burden level found in figure (2), the current study showed that nearly half of the caregivers had a severe burden. These results are supported by **Hassan et al., (2019)**, who stated that most of the caregivers had severe burdens. While these results contradict the study by **Sayed et al., (2020)**, who reported that a third of the caregivers had a moderate to severe burden and nearly half of them had a mild to moderate burden, this could be explained by the longer caregiving duration, as the majority of the patients had liver cirrhosis for two years, and most of them had decompensated liver cirrhosis with other comorbidities and a history of hospitalization.

Regarding caregivers coping strategies found in figure (3), the present study revealed that caregivers significantly used problem-focused coping strategies. This might be related to the fact that the majority of the caregivers were male and had a university education, so they had the ability to solve their problems. These results were supported by **Kazemi et al., (2021)**, who found that male caregivers reported problem-focused coping strategies, whereas female caregivers tended to report more emotion-focused coping. These results are consistent with **Hsu et al., (2019)**, who claimed that the majority of caregivers used a problem-solving approach to care for their patients.

Regarding the relation between knowledge and burden level of the caregivers found in table (5). The current study showed that the caregiver burden was statistically significantly higher among those who had poor knowledge regarding liver cirrhosis. This finding is in line with **Sayed et al., (2020)**, who noted that there was a statistically significant difference

between total knowledge score of hemodialysis and burden level of the caregivers. This might be due to more informed caregivers about the condition and social resources for treatment of their patients, who are better able to deal with stressful events and experience less burden.

Regarding the correlation between the caregiver's knowledge level and problem-focused engagement coping strategy found in table (6). The present study pointed that total knowledge level were positively correlated with problem-focused engagement. This result can be explained by the fact that the caregivers with high knowledge scores tried to learn more about the problem and acquire new problem-solving techniques.

Regarding correlation between the caregiver's knowledge level and the problem-focused disengagement coping strategy found in table (6). The present study revealed that knowledge level correlated negatively with problem-focused disengagement.

Regarding correlation between the caregiver's knowledge level and the emotion-focused disengagement coping strategy found in table (6). The present study revealed that knowledge level correlated negatively with emotion-focused disengagement.

Regarding correlation between caregiver's burden level and problem-focused engagement coping strategy found in figure (4). The current study found that there was a significant negative correlation between caregiver burden and problem-focused engagement. This result is supported by a study done in the USA by **Chen et al., (2018)**, who found that problem-focused coping was negatively correlated with caregiver burden, and a study done in Eastern Turkey by **Dayapoğlu & Tan (2017)**, who reported that there was a negative correlation between caregiver burden and total social support. This may be related to the fact that attention to the problem and focusing on it can decrease caregiver burden.

Regarding correlation caregiver's burden level and problem-focused disengagement coping strategy found in figure (5). The current study also found a significant positive correlation between caregiver burden and problem-focused disengagement. This would be interpreted as restricted leisure time of caregivers because of their care for their patients let the caregivers lost their relationships with others; they experience social problems, so they engage in dysfunctional behavior such as sitting alone, blaming themselves, and avoiding the stressful situation.

Regarding the relation between caregiver's burden level and elderly patient's personal characteristics found in table (7), the current study revealed that caregiver burden was severe among those whose

patients aged more than 70 years old. This can be interpreted as meaning that the older patients place more burden due to frailty and deterioration in health. The current study showed that caregiver burden was severe among those whose patients were male. This may relate to the fact that the male is responsible for supporting his family financially, and his sickness places more burden on the caregiver.

The present finding illustrates that caregiver burden was severe among those whose patients were married. This may relate to the fact that married patients have more responsibilities toward their families, and their inability to perceive it places more burden on their caregivers.

The present finding illustrates that caregiver burden was severe among those whose patients were illiterate. This result is supported by **Shrestha et al., (2020)**, who reported that lower patient education is considered a factor that increases caregiver burden. This may be due to the fact that the non-educated patient requires extensive care; many are unable to organize their medications and drive to their medical appointments separately, so they become more dependent on their caregiver.

The current study revealed that caregiver burden was severe among those whose patients had comorbidities associated with liver cirrhosis. This may be explained by the fact that comorbidities place more burden on caregivers and necessitate more attention and treatment monitoring. The recent findings contradict the study by **Shrestha et al., (2020)**, who claimed that common comorbidities like diabetes, hypertension, and hypothyroidism in individuals with cirrhosis had no effect on caregiver burden.

The current study showed that caregiver burden was severe among those whose patients had a history of hospitalization this result is in line with by **Hareendran et al., (2020)**, which revealed that frequent hospitalization and hepatic encephalopathy were indicators of caregiver burden in patients with liver cirrhosis. This could be explained by the frequent patient hospitalization places more burden on the caregiver.

The present finding revealed that caregiver burden was severe among those whose patients had decompensated liver cirrhosis. This result is consistent with **Hareendran et al., (2020)**, who revealed that the severity of liver cirrhosis is a predictor factor that increases caregiver burden. This may be explained by the fact that patients with decompensated cirrhosis have complications that place a great burden on the caregiver.

The present analysis demonstrated that caregiver burden was severe among those whose patients had liver cirrhosis from one year. This might be explained by the fact that caregivers of newly diagnosed

patients may be confronted for the first time with the crisis and don't have the ability to cope with it, but with time they gain more strength and learn to cope with the stressors.

Regarding relation between the caregiver's coping strategies and the elderly patient's personal characteristics found in table (8). The present analysis revealed that problem-focused engagement coping strategy was statistically significantly higher among caregivers whose patients didn't have a history of comorbidities. This might be related to the fact that patients with other comorbidities place more burden on the caregivers, which affects their coping and makes them less able to cope effectively.

The present study pointed out that there was no statistically significant relation between caregiver's problem-focused engagement coping strategy and the age, gender, marital status, level of education. These findings are supported by **Mohmed et al., (2019)**, who found that there was no statistically significant relation between caregiver's problem-focused engagement coping strategy and the age, gender, marital status, and level of education of their patients.

The present study also showed that problem-focused disengagement coping strategy was statistically significantly higher among caregivers whose patients were male. These findings contradict the study by **Mohmed et al., (2019)**, who reported that problem-focused disengagement coping strategy was statistically significantly higher among caregivers whose patients were female.

The current study also revealed that problem-focused disengagement coping strategy was statistically significantly higher among caregivers whose patients were unmarried. These results disagree with **Mohmed et al., (2019)**, who reported that there was no statistically significant relationship between caregiver's problem-focused disengagement coping strategy and the marital status of their patients.

The present study also showed that problem-focused disengagement coping strategy was statistically significantly higher among caregivers whose patients were hospitalized more than three times for liver cirrhosis. This may be explained by the fact that because of the frequent hospital admissions, the caregiver loses control over his life and tries to avoid the stress to cope with the problem.

The present study revealed that there was no statistically significant relation between caregiver's problem-focused disengagement coping and the age, history of comorbidities, stages, and duration of liver cirrhosis in their patients.

The present findings show that emotion-focused engagement coping strategy was statistically significantly higher among caregivers whose patients were married, had basic education, were hospitalized

three times, and had liver cirrhosis from one year. From the investigator's perspective, they faced the crisis of disease and hospitalization for the first time, so they tried to express emotion and ask for help and social support. These findings contradict the study by **Mohmed et al., (2019)**, who reported that there was no a statistically significant relationship between the emotion-focused engagement coping strategy of the caregivers and the marital status or level of education of their patients.

The current study established that emotion-focused disengagement coping was significantly higher among caregivers whose patients had been hospitalized one or two times and had liver cirrhosis from more than two years. This would be interpreted as restricted leisure time for caregivers because of their long duration of care for their patients, so they lose relationships with others and experience social problems as they sit alone, criticize, and blame themselves.

Conclusion:

Based on the results of the current study, it was revealed that the majority of the studied caregivers had poor knowledge regarding liver cirrhosis and nearly half of them had a severe burden as a result of caring for their patients; Problem-focused engagement is the most utilized coping strategy. Additionally, caregiver's knowledge affects the burden and coping strategies.

Recommendations:

In light of results of this study, the following recommendation(s) are suggested:

- Conduct education and training programs to caregivers about caring for elderly patients with liver cirrhosis
- More research should be done to determine what factors contribute to the burden of care for caregivers.
- Provide educational programs that educate caregivers on appropriate coping skills and encourage problem-focused coping that results in positive outcomes.

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