

Effect of Self Management Program on Health Outcomes of the Patients with Liver Cirrhosis

Shaimaa Magdy Abd Allah¹, Hanan Gaber Mohamed², Samah Elsaid Ghoneim³, and Nehal Mahmoud Abo El –Fadl ⁴

(1) Assistant lecturer in Medical Surgical Nursing, Benha University, Egypt, (2) Professor of Medical Surgical Nursing, Benha University, Egypt, and (3,4) Assistant Professor of Medical Surgical Nursing, Benha University, Egypt

Abstract

Background: Liver cirrhosis defined as a chronic liver illness characterized by extensive hepatic cell death and fibrotic cell regeneration. Self-management program has proven to be a key tool in disease management, providing significant benefit in knowledge and behavioral modifications, reduce experience of symptoms which improving patients' HRQOL. **Aim of the study:** Was to evaluate the effect of self-management program on health outcomes of LC patients. **Design:** Quasi-experimental design was used. **Setting:** Hepatology department at Benha University Hospital. **Subject:** A purposive sample of (58) LC patients from both sexes (third stage). **Tool of data collection:** Two tools were used. **Tool I:** Structure questionnaire was divided into 4 parts (1): Demographic data, (2): Medical history, (3): Patients' knowledge assessment, (4) Self-management behavior. **Tool II:** Health outcomes assessment divided into two parts (1): Health related quality of life (HRQOL), (2): Symptoms experience. **Results:** The LC patients' total knowledge & behavior were improved post program implementation from (23.8% & 41.3%) to (71.5% to 58.0%) of the studied patients, respectively and patients' HRQOL improved from 54.6% to 58.2% on 1st month, respectively. **Conclusion:** Self-management program has been shown to be effective on improving patients' knowledge, behavior and HRQOL. **Recommendation:** Continuous education for LC patients about self management to manage symptoms and improve their quality of life.

Keywords: Health outcomes, Liver cirrhosis, Self management program.

Introduction:

Liver cirrhosis (LC) is chronic disease which characterized by chronic parenchymal distortion, fibrous band formation and nodule formation, with shrinkage of the liver. It is started by an asymptomatic stage "compensated cirrhosis", followed by "decompensated cirrhosis" that characterized by occurrence of complications (Nanchal, & Subramanian, 2018).

Risk factors for LC are diverse, as increased alcohol consumption and hepatitis infection as hepatitis B and C infection & nonalcoholic fatty liver disease. Other risk factor as pancreatitis, injuries from gallbladder surgery, some inherited disorders

as hemochromatosis also, autoimmune hepatitis lead to cirrhosis (Atya, et al., 2019).

Complications of LC include portal hypertension and esophageal , gastric varices ,ascites, coagulation factor deficiencies spontaneous bacterial peritonitis, hepato-renal syndrome, hepato-pulmonary syndrome and hepatic encephalopathy can be occurred as result of cirrhosis (Rodenbaugh et al., 2020).

Health-related quality of life defined as the impact of disease and treatment on the patients' disability, daily living and ability of perceived their health state encompasses several domains, as those related to physical (Karimi & Brazier, 2018).

Educating LC patients assists them to manage their disease, reduce occurrence of complications, improve treatment adherence, reduce healthcare costs which in turn reflects on their health outcomes through reducing symptoms experience and improve their HRQOL (**Janani et al., 2018**).

Improve self management behavior of liver cirrhosis patients means increasing patients' knowledge by describing the facts about the disease and its management that patients need to understand to enable them to perform complex self-care activities concerning medication adherence and life style modification (**Dong et al., 2018**).

Significance of the study

The world health organization (WHO) estimated during 2019 that 296 million people worldwide are living with hepatitis B, 58 million are living with hepatitis C, 1.5 million were newly infected with chronic hepatitis B, 1.5 million people were newly infected with chronic hepatitis C (**World Health Organization, 2021**). Egypt has the largest epidemic of HCV in the world that are the main causes of chronic hepatitis, liver cirrhosis, and Hepato Cellular Carcinoma (HCC). The prevalence rate of HBV (1.3%-1.5%) has declined after national infantile immunization. Also, a lower rate of HCV prevalence (4.6%) was recently reported after the conduction of multiple national programs to control HCV infection as in 2018, Egypt screened more than 50 million and treated more than 4 million residents for HCV (**Hassanin et al., 2021**).

Operational definition of health outcomes: refers to a Health Related Quality of Life (HRQL) and symptoms experience (**Orr et al, 2014**).

Aim of the study:

Evaluate the effect of self management program on health outcomes among LC patients.

Study hypotheses:

To achieve this aim, the following study hypotheses were formulated:

H1 -The level of patients' knowledge will be improved significantly after program implementation.

H2-The level of patients' behavior will be improved significantly after program implementation.

H3- The patients' HRQL and symptoms experience will be improved significantly after program implementation.

Subjects and method:

Study design:

Quasi-experimental pre and post intervention comparison study design was implemented to achieve the aim of the present study.

Setting:

The hepatology department of Benha University Hospital

Subjects:

Purposive sample of 58 patients from both sexes diagnosed with LC (third stage) for a period of 9 months.

The sample size was estimated by using Epi-Info-7 program through applying the following parameters:

- (1) Population size =90 per 6 months
- (2) Expected frequency = 50%
- (3) Accepted error = 5%; and (4) Confidence coefficient = 95%.

The minimum sample size required was 58 patients.

Tools of data collection:

Two tools were used to collect data to achieve the study's aim as follows:

Tool I: Structured interview questionnaire: It was adapted from (**Alavinejad et al., 2019**). It consisted of the following 6 parts:-

Part 1: Patient demographic data. It consisted of 6 closed ended questions related to age, gender, education level, marital status, occupation and residence.

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Part2: Medical history included 9 closed ended questions about previous and current hospitalization and it's cause, detection and causes of liver cirrhosis, previous of frequent blood transfusion and its amount, associated chronic diseases and history of medication.

Part 3: Patient's knowledge questionnaire: It was adapted from (Mohammed, 2019) and (Goldsworthy et al., 2017) consisted of 23 closed ended questions about:

- Anatomy, function and definition of LC (3 questions).
- Risk factors, causes, S&S and diagnosis of LC (4 questions).
- Treatment of LC (2 questions)
- Complications and methods of its prevention (5 questions)
- Precautions to relieve symptoms (6 questions)
- Dietary instructions (3questions).

Scoring system:

Correct answer was given one score and incorrect answer was given zero are converted into percentages and categorized as follows:

- **Poor level** (less than 50%) = less than 12 score
- **Moderate level** (50% to less than 80%) = 12 to less than 19 score.
- High level** (equivalent and 80% or higher) = 19-23 score. Total knowledge scores was: 23 score.

Part 4: Self management behavior questionnaire: Was adapted from (Wang et al., 2018) .Consisted of 30 items and categorized into 4 dimensions:-

- Nutrition management (10 questions).
- Daily lifestyle (11 questions).
- Medication (4questions).
- Disease monitoring (5 questions).

Scoring system:

Likert scale was used as follow: All the time (4 score), most of the time" (3 score), some of the time (2 score), rarely (1 score)

never (zero score).The total score converted into percent, then categorized as follow:

- Poor (<50%) = less than 60 score
- Fair (50% to <80%) = 60 to less than 96 score
- Good (equal to or more than 80%) = 96 to 120 score
- Total score of self-management behavior was: 120 score.

Tool II: Patients' health outcomes assessment: (pre and post program): It included two sections:

Section I: HRQL assessment: It was adapted from (Ware, 2000). It consisted of 36 closed ended questions divided into 8 domains:

- General health: it included 2 questions
- Limitation of activities: it included 10 questions
- Physical Health Problems: : it included 4 questions
- Emotional Health Problems : it included 3 questions
- Social activities: it included 1 question
- Pain: it included 2 questions
- Energy and Emotions: it included 9 questions

The total score converted into percent, then categorized as follow:

- Low HRQOL (<50%) = less than 56 score
- Fair HRQOL (50% to <80%) =56 to less than 90 score
- High HRQOL (equal to or more than 80%) = 90 to 112 score

Total score of HRQL was: 112 score.

Section II: Patients' Symptoms experience.

It was adapted from (Abdel Reham & Mohamed, 2017) .It consisted of 9 questions about: GIT symptoms, fatigue, joint pain, weakness, dyspnea, peripheral edema, weight loss, memory impairment, or psychosocial symptoms such as depression or anxiety.

Scoring system:-

- Always (zero score)

- Sometimes(one score)
- Never (two score)

The high score indicated increase patients' frequency experience of symptoms (18 score).

Educational self management booklet:

Adapted from (Ahmed et al., 2018), (Awadallah et al., 2020) & (Tandon & Montano-Loza, 2019) and designed by the researcher .Consisted of two parts:

1-Theoretical part: It was included; definition, risk factors, signs, symptoms, diagnosis, investigations, management and instructions about the preventive measures of the complications.

2-Self management practical part: It included: daily-life management; dietary management; illness monitoring and medication management, mouth care, enema, care of pruritus

Tool validity& reliability: The tool was tested by 5 experts in the field of medical-surgical nursing, Benha University and necessary modification was done. The reliability of questionnaire which assess knowledge was 0.844, behavior was 0.801, feeling of symptoms was 0.920 & HRQOL was 0.814.

Ethical considerations:

- The study approval was obtained from the ethical committee of nursing faculty of nursing Benha university before initiating the study work.
- The researcher clarified the purpose and aim of the study to patients included in the study before data collection.
- Oral consent was obtained from the patients to participate in the study.
- The researcher was assured maintaining anonymity and confidentiality of data.
- The patients were informed that they allowed to choose their participation in the study and

they have the right to withdraw from the study at any time.

Pilot study:

A pilot study was conducted on 10% of the study subjects (6 patients) in order to test the clarity and applicability of the study tools and the program, also to estimate the time required for each tool to be filled by the researcher as well as to identify any possible obstacles that may hinder data collection. Based on the results of the pilot study the necessary modifications were done for more applicable tools to collect data. The patients selected for the pilot study were excluded from the study subjects and replaced by another. The pilot study was done two weeks before starting the study.

Field work:

Data collection was carried out during a period of 9 months from the beginning of October 2021 to the end of June 2022.

Assessment phase: This period took 2 months. Each patient interviewed using a structured interview questionnaire using (tool I).

Planning phase: This period took 2 months. The program designed, revised and modified according to the patient's needs.

Implementation phase: This period took 3 months. The researcher gave the program to patients immediately after data assessment. The program was implemented in the form of 5 sessions. The duration of each session was one hour for each 5 patients

Session one: Constructed to orient the patient with program sessions and explaining its purpose. Discuss definition of LC, causes, signs and symptoms.

Session two: Constructed to discuss the patients' knowledge related to methods of diagnosis of liver cirrhosis.

Session three: It included treatment of LC, dietary regimen and general advices to LC patient.

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Session four: Educate the patients about importance of self-measuring blood glucose and medications that patients should be avoided

Session five: Concerned with practical part as enema care, oral care and skin care.

Evaluation phase: Evaluation of patient' knowledge using developed questionnaire (part 3) was done immediate & 1st month post program while evaluating behavior (part 4) and HRQOL & experience of symptoms (tool II) was done on 1st & 2nd month post program implementation.

Statistical analysis:

Friedman test: For abnormally distributed quantitative variables, to compare between more than two periods

Marginal Homogeneity Test: Used to analyze the significance between the different stages.

F-test (ANOVA): For normally distributed quantitative variables, to compare between more than two categories.

Paired t-test: For normally distributed quantitative variables, to compare between two studied categories.

Pearson coefficient: To correlate between two normally distributed quantitative variables.

Results:

Table (1) demonstrates that, 48.3% of the studied patients' age between 40- <50 years with a mean age of (51.84 ± 5.77) , while 74.1% of them were males and married. Regarding educational level, 44.8% of them were read and write.

Figure (1) demonstrates that the mean score of the studied patients' knowledge in pre self-management program implementation was 23.8% which improved to 84.0% & 77.7% in immediate & 1st month post self-management program implementation.

Figure (2) demonstrates that the total patients' behavior in pre self-management program implementation was 41.33% which improved to 71.62% & 57.97%. on 1st month 2nd month of follow up.

Figure (3) demonstrates that mean % score of patients' HRQOL related to self-management pre and post program implementation. Illustrated that patients' HRQOL was 54.6% in pre self-management program implementation which improved to 58.2% on 1st month post self-management program implementation and reached 51.4% on the 2nd month of follow up .

Table (2) shows that, mean and standard deviation of degree of patients' feeling of symptoms was (5.26 ± 1.55) pre program implementation which increased to (11.72 ± 2.10) & (10.03 ± 1.65) on 1st & 2nd month post program implementation.

Table (3) shows that there was high significant statistical relation between patients' total behavior and their sex in average post self-management program implementation. Also, there was statistically significant relation between patients' total behavior and their marital status in average post self-management program implementation.

Table (4) shows that was statistically negative correlation between total patients' knowledge and their symptoms in average post self-management program implementation. Also, there was statistically significant negative correlation between patients' behavior and their HRQOL in average post self-management program implementation, respectively.

Table (1): Distribution of the studied patients regarding their demographic characteristics (n= 58)

Variables	Total (n= 58)	
	No.	%
Age (years)		
30 – < 40 years old	3	5.2
40 – < 50 years old	28	48.2
50 – 60 years	27	46.6
Mean ± SD.	51.84 ± 5.77	
Sex		
Male	43	74.1
Female	15	25.9
Education level		
Illiterate	22	37.9
Read and write	26	44.8
Intermediate qualification	6	10.4
High qualification	4	6.9
Marital status		
Single	1	1.7
Married	43	74.1
Divorced	5	8.6
Widowed	9	15.6
Occupation		
Manual work	33	56.9
Employee	13	22.4
Not working	12	20.7
Residence		
Rural	47	81.0
Urban	11	19.0

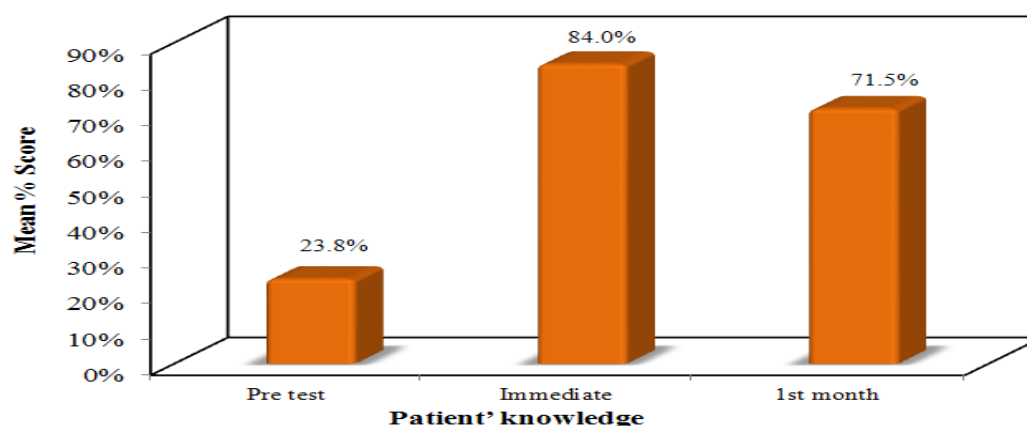


Figure (1): Mean % score of total patients' knowledge regarding LC and its management pre and post program implementation (n=58)

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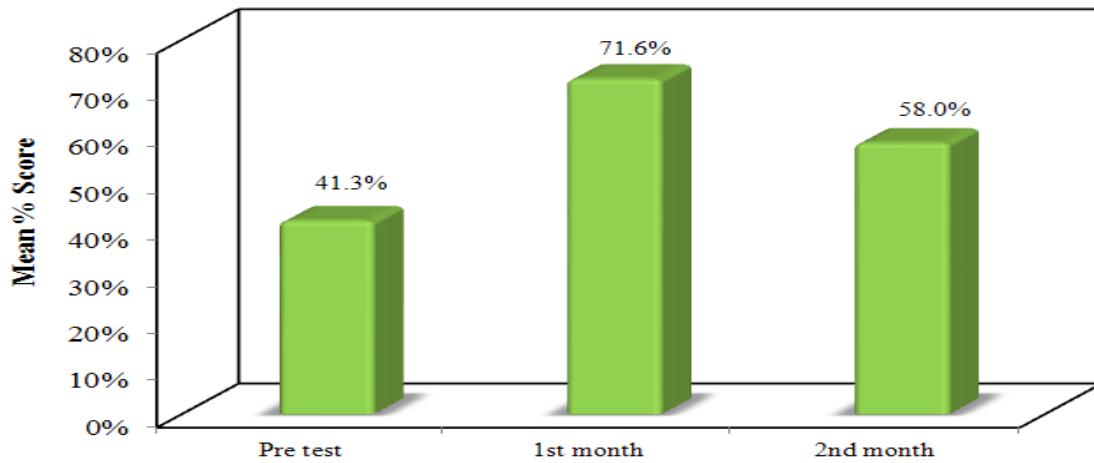


Figure (2): Mean and standard deviation of patients' behavior related to self management pre and post program implementation (n=58)

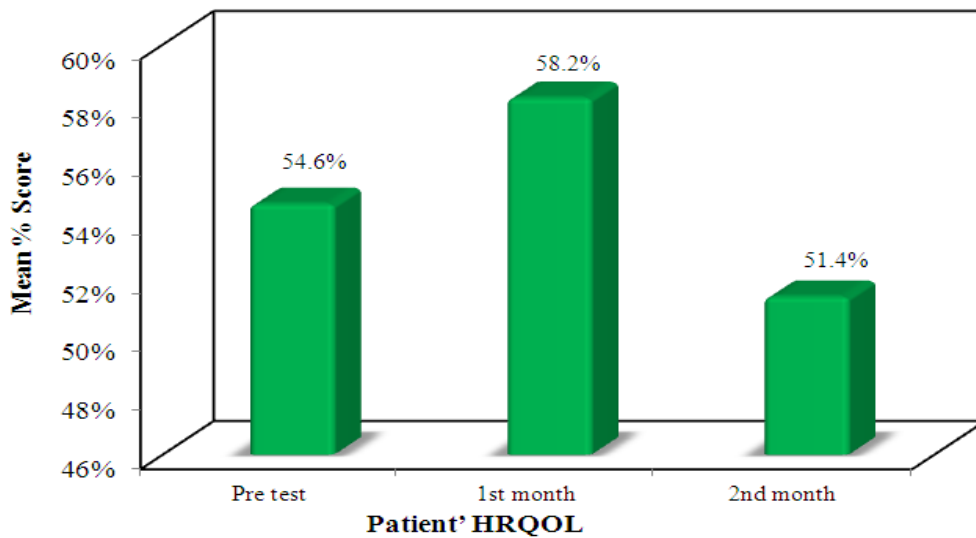


Figure (3) Mean % score of patients' HRQOL related to self management practice pre and post program implementation (n=58).

Table (4): Mean and standard deviation and significant differences of the studied patients' experience of symptoms pre and post self management program implementation (n= 58)

Variables	TS	Pre test	Post test			F (p)	Pretest vs. Post test		
			1 st month	2 nd month	Average		p ₁	p ₂	t (p ₃)
Patients' experience of symptoms									
Min. –Max.		2.0 – 9.0	6.0 – 16.0	5.0 – 14.0	6.0 – 15.0	282.003			
Mean ± SD.	(0–18)	5.26 ± 1.55	11.72 ± 2.10	10.03 ± 1.65	11.14 ± 1.70	(<0.001*)	<0.001*	<0.001*	19.483* (<0.001*)

Table (2): Relation between total patients' behavior and their demographic characteristic (n=58)

Demographic characteristic	N	Overall behavior	
		Pre	Average post
		Mean ± SD.	Mean ± SD.
Age (years)			
30 – < 40 years old	3	39.33 ± 11.85	65.67 ± 2.08
40 – < 50 years old	28	39.43 ± 6.24	65.18 ± 4.70
50 – 60 years	27	43.52 ± 6.35	64.85 ± 4.50
F_p		0.069	0.937
Sex			
Male	43	40.67 ± 6.62	64.37 ± 4.87
Female	15	43.20 ± 7.12	67.0 ± 2.04
t_p		0.217	0.006*
Education level			
Illiterate	22	42.82 ± 6.07	65.14 ± 4.79
Read and write	26	39.92 ± 7.21	65.15 ± 4.32
Intermediate qualification	6	41.17 ± 5.91	64.67 ± 4.63
High qualification	4	42.50 ± 9.47	64.50 ± 4.93
F_p		0.523	0.989
Marital status			
Single	1	40.0	66.0
Married	43	40.98 ± 6.53	64.53 ± 4.26
Divorced	5	45.80 ± 8.53	70.40 ± 2.51
Widower	9	40.67 ± 7.31	64.44 ± 4.82
F_p		0.502	0.042*
Occupation			
Manual work	33	42.0 ± 7.09	64.30 ± 4.56
Employee	13	42.15 ± 7.70	65.15 ± 4.47
Not working	5	39.20 ± 2.59	67.0 ± 5.20
Housewife	7	38.14 ± 5.11	67.0 ± 3.06
F_p		0.476	0.365
Residence			
Rural	47	41.53 ± 7.17	65.26 ± 4.48
Urban	11	40.45 ± 4.95	64.18 ± 4.45
t_p		0.640	0.477

Table (6): Correlation between total patients' knowledge, behavior, patients' experience of symptoms and HRQOL (n=58)

		Total knowledge		Total behaviors	
		Pre	Average post	Pre	Average post
Patient symptoms	r	0.038	-0.069	0.170	0.092
	p	0.778	0.606	0.201	0.493
Health related quality of Life	r	0.115	0.094	-0.211	-0.360*
	p	0.392	0.483	0.111	0.005*

Discussion:

Improving LC patients knowledge about the disease and its management will be reflect on self-management behavior and reducing incidence of complications and have better QOL **Dong et al., (2018)**. LC characterized by diffuse hepatic cell destruction and fibrotic regeneration. As fibrosis change the normal vasculature and shape of the liver, reduces blood flow, and eventually leads to hepatic insufficiency **Pazokian & Esmaeili (2019)**.

The present study revealed that near half of patients' age between forty to less than fifty years with mean age (51.84 ± 5.77) years. It might be related to liver disease is common in middle and old age than young age. This finding is agreement with **Roshdy et al., (2019)** who reported that the mean age of the participants was (49.2 ± 7.12 years).

As regard to sex, the current study revealed that nearly three quarters of studied patients were males. It might be due to liver disease is common in males than females. This finding is agreed with **Shedeed, (2021)**, who found that more than three fifths of the studied patients were males. In contrast **Ismail et al., (2018)**, mentioned that more than half of the studied samples were females.

As regard to educational level, the present study findings revealed that less than half of studied patients were read and write. It might be due to their rural culture that not interested in education. This result is in the same line with **Zhu et al., (2016)**, who clarified that liver cirrhosis is more common in patients with middle school education.

Pertaining to patient' marital status, the current study revealed that three quarters of the studied patients were married. It might be due to cultural aspect of the studied sample. This finding was supported by **Abdullah et al., (2021)** who reported that the majority of the studied sample were married.

Concerning their occupation, the results of the present study showed that more than half of them had worked manual work, it might be due to their level of education and residence as most of them were from rural areas. The result is in accordance with **Abdel Reham & Mohamed (2017)**, who reported in their study that the majority of patients had worked as employers and farmers (workers). In contrast **Al-Johani et al., (2018)**, who reported in their study that two-thirds of the participants were employees.

Concerning residence, the present study showed that the majority of the studied patients were lived in rural areas. It may attributed to living in rural area in which individuals have a various life style factors such as nutrition and water intake, contact with pollutions. This finding is in the same line with **Abd Allah (2020)**, mentioned that most of studied patients were living in rural areas. In contrast **Atiyah & Majeed, (2015)** who clarified that more than half of studied sample were from urban areas.

The study revealed that there was an improvement in mean scores of studied patients' total knowledge regarding self management post program implementation compared to pre program implementation. It might due to theoretical sessions that were provided to patients which cover all aspects of liver cirrhosis .These results come in accordance with a study conducted by **Elshamy et al., (2018)**, reported that there was an improvement in the studied patients knowledge post instruction application.

The present study revealed there was statistically significant difference between patients' behavior pre and average post program implementation. It is in the same line with **Alfauomy et al., (2020)**, who reported that, there was a statistical significant difference between pre and post interventions in the study group than control group.

The present study revealed that there was a significant decrease in experience of symptoms and discomfort on 1st & 2nd month post self management program implementation compared to pre-implementation. It might be due to patients follow healthy behaviors in different aspects of daily life. The findings are congruent with **Israelsen et al., (2017)**, who reported that there was a significant decrease in abdominal symptoms after the educational intervention in the case group while control group didn't have any significant change .

There was a statistical significant improvement in patients' total HRQOL post program implementation compared to pre program implementation. These results come in accordance with **Gazineo et al., (2021)**, who reported that before receiving education, patients in the study group, scored low to moderate quality of life which improved after one month of receiving the educational program, while remains the same in the control group.

The current study showed that there was statistically significant relation between patients' total behavior regarding self management and their sex and marital status in average post self management program implementation. This result is in the same line with **Shedeed (2021)**, who found that there were statistically significant relation between the total score of healthy lifestyle behaviors and patients marital status, gender, educational level and income.

Additionally the study revealed that there was statistically negative correlation between total patients' knowledge and their experience of symptoms in average post self management program implementation. These results are consistent with **Besely et al., (2022)**, who revealed that providing patients with nursing intervention and knowledge about chronic hepatitis C, seemed to have positive effects on

improving patients' knowledge about diseases that reflected by improvement of patients complains especially fatigue level.

Although, many research revealed that changing patients behavior reflect positively on their HRQOL as **Alavinejad et al., (2019)**, who mentioned in their study that there was significant relation between studied patients behavior and their quality of life and **Mahmoud, (2018)**, who clarified that there was a statistically significant positive correlation between behavior score and quality of life score pre, post, and two months following implementation of the self-care protocol about liver cirrhosis

But the present study showed a negative correlation between HRQOL and their behavior in average post self management program implementation. It may be attributed to the program follow up was need long time evaluate and increase time to change their life style behavior. Also, may be attributed to age of studied patients which play rule in their eating habits and their behavior or related to the longer period of disease as the selected patients in third stage of disease. It is in the same line with **Abd El Hamied et al., (2020)**, who clarified that there was a fair negative association between duration of disease, behavior of the studied sample with their total quality of life measured by short-form of health before administration of treatment with Sofosbuvir and Daclasvir.

Conclusion

Self management program has been shown to be effective on improving patients' knowledge, behavior and HRQOL

Recommendations:

- Continuous education for LC patients about self management to manage symptoms and improve their QOL.
- Replication of the study in different hospital settings for generalization of the results.

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تأثير برنامج الإدارة الذاتية على المخرجات الصحية لمرضى تليف الكبد

شيماء مجدى عبدالله جوده- حنان جابر محمد- سماح السيد غنيم- نهال محمود أبو الفضل

يُعرّف تليف الكبد بأنه مرض مزمن ومتطور يصيب الكبد ويتسم بإحلال خلايا الكبد وتدميرها حيث يحدث تشوه ببنية الكبد الطبيعية و العصابات الليفية للأنسجة الضامة مما يضعف تدفق الدم. عادة ما يكون المرض فى مراحل المتقدمه قبل أن تكون أعراضه ملحوظة بدرجة كافية و قد يكون فقدان الوزن والضعف من الأعراض المبكرة لتليف الكبد. لذلك هدفت الدراسة إلى تقييم تأثير برنامج العناية الذاتية على المخرجات الصحية لمرضى. تم استخدام تصميم البحث شبه التجريبي لتحقيق الهدف من هذه الدراسة. وأجريت هذه الدراسة في قسم أمراض الكبد التابع لمستشفى بنها الجامعي ، محافظة القليوبية، مصر. تم استخدام عينة غرضيه فى الدراسة الحالية (58 مريضاً). قد أسفرت النتائج على هناك زيادة ذات دلالة إحصائية في متوسط الدرجة لمعلومات المرضى بعد تنفيذ برنامج العناية الذاتية مباشرة وفي الشهر الأول مقارنة بما كان عليه قبل تنفيذ البرنامج. كذلك شهد مرضى تليف الكبد تحسناً ملحوظاً في مستوى المعرفة وكذلك مستوى سلوكهم والمخرجات الصحية لديهم خلال الشهر الأول ، والشهر الثانى بعد تنفيذ البرنامج الذي يؤكد فرضيات الدراسة. وأوصت الدراسة على إقامة دراسات مماثلة لتقييم الآثار طويلة المدى لمثل هذه البرامج التعليمية و أيضاً يجب توفير دورات تدريبية للمرضين لزيادة معارفهم ومهاراتهم اللازمة لرعاية مرضى تليف الكبد وللتقليل من حدوث المضاعفات