

# Effect of Educational Program on Self-management among Elderly Patients with Liver Cirrhosis

Sherihan Awadallah Abd Elazaiem Ali <sup>1</sup>Eman Shokry Abd Allah<sup>2</sup>, & Dalia Abdallah El-Shafei <sup>3</sup>

<sup>1</sup> Assistant lecture of Gerontological Nursing, Faculty of Nursing, Zagazig University, Egypt

<sup>2</sup> Professor of Gerontological Nursing, Faculty of Nursing, Zagazig University, Egypt.

<sup>3</sup> Assistant professor of Occupational and Environmental Medicine, Faculty of Medicine, Zagazig University, Egypt.

**Corresponding Author:** Sherihan Awadallah Abd Elazaiem Ali.

**Email:** adam 201250@yahoo.com , Sherihan abdelaziem@gmail.com

## Abstract

**Background & Aim:** Effective chronic disease self-management requires patients to have the necessary knowledge and skills to engage in self-care tasks, develop and maintain a satisfactory quality of life. Therefore, this study aimed to evaluate the effect of educational program on self-management among elderly patients with liver cirrhosis.

**Methods & Materials:** This quasi-experimental study was conducted in liver diseases center in El-Ahrar Teaching Hospital at Zagazig City. The study sample composed of 80 elderly patients with liver cirrhosis, purposively assigned according to study inclusion criteria. Twelve sessions for small groups (2 to 4 elderly patients in each group) were held as part of the program's implementation in the current study. Three tools were used; interview questionnaire which is composed of two parts: Demographic characteristics and Health profile of the studied elderly patients, Modified Self-Management Knowledge Questionnaire, and Self-management behavior scale.

**Results:** The study findings reported that only 16.3% of the studied elderly patients had satisfactory total self-management knowledge pre-program, and then improved to become 77.5% post-program. Also, there was improvement in total mean score of elderly patients' self-management behavior domains post program with a highly statistically significant difference ( $P < 0.01$ ) between pre and post program. Additionally, there was statistical significant positive correlations between the studied elderly patients' total self-management knowledge and total self-management behavior ( $r = 0.601$ ).

**Conclusion:** The applied educational program was effective in increasing self-management knowledge level and promoting self-management behavior among studied elderly patients with liver cirrhosis.

**Keywords:** Educational Program, Self-management knowledge, Self-management behavior, Liver cirrhosis

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## Introduction

Older populations are more prone than younger populations to have severe liver diseases. The proportion of older patients with liver cirrhosis is steadily rising as the world's population ages. Hepatic function, damage responses, and liver cirrhosis consequences are all negatively impacted by ageing (1). Liver cirrhosis is currently the 11th leading cause of death worldwide. Geriatric patients had a mortality rate from liver cirrhosis that was 12 times higher than that of younger patients. Furthermore, 50 percent of elderly patients with liver cirrhosis die within a year after their diagnosis (2).

Liver cirrhosis (LC), a serious health issue that is considered the final stage of chronic liver disease and is characterized by significant hepatic fibrosis with potential adverse effects on hepatic function (3). The most common causes of liver cirrhosis include hepatitis C or B infection, excessive alcohol use, and nonalcoholic fatty liver disease (NAFLD). These factors may cause persistent fibrosis and the development of scars, which gradually alter normal liver structure and function and ultimately result in liver cirrhosis (4).

Optimal management of liver cirrhosis can be challenging due to the fact that many patients must adhere to complicated medication regimens, dietary restrictions, and illness monitoring activities (5). Furthermore, patients with decompensated liver cirrhosis typically experience serious complications that inhibit their ability to self-manage and control their condition such as ascites, hepatic encephalopathy, bleeding from varicose veins, and liver cancer (6).

Self-management describes a person's capacity to control their lifestyle, treatment, symptoms, psychosocial, cultural, and spiritual implications of their health conditions in collaboration with their community, family, and healthcare providers. For best self-management, one must be able to independently monitor their health condition (7). Previous research has demonstrated that individuals with liver cirrhosis had inadequate understanding of their condition and the tasks necessary for self-care, which was linked to poor self-management and poorer levels of adherence to clinician recommendations (8).

Multiple studies have shown that geriatric patients with liver cirrhosis who actively participate in self-care take more responsibility for managing their symptoms, recover faster, avoid complications, function at their best, spend less time in the hospital, and have better health-related quality of life (2). Because they are the healthcare providers that regularly interact with patients and their families, gerontological nurses are in a unique position to offer health education. Additionally, they have the best opportunity to identify potential problems, talk about treatment plans, and provide information on all facets of self-care including recognizing your limitations, preserving your energy, making dietary changes, and taking your medications on time with paying attention to any adverse reactions (9).

Effective patient education has emerged as an essential method in diseases self-management, offering important benefits in terms of knowledge and behavioral change. Additionally, there is a paucity of literature on the impact of patients' education on self-

management for elderly patients with liver cirrhosis. Hence, this research aimed to evaluate the effect of educational program on self-management among elderly patients with liver cirrhosis.

## Method

### *Study Design and Setting*

A quasi-experimental study design was utilized to conduct the current study in liver diseases center in El-Ahrar Teaching Hospital at Zagazig City.

### *Sample*

The sample of this study included 80 elderly patients from the aforementioned setting who met the following criteria; A confirmed diagnosis of liver cirrhosis (mild–moderate stages) by ultrasonography (obtained from patients sheet), agree to participate in the study and able to communicate.

### *Sample size calculation*

Using the EPI Info software version 6.04, the sample size was calculated. It was based on mean and SD of CLDQ after intervention was  $112.5 \pm 75$  in the control group versus  $171.9 \pm 110$  in intervention group (10). With a power of 80% and at confidence level 95%, so the sample was 80 patients plus eight elderly patients for pilot study which were excluded from the study.

### *Tool of data collection*

To gather the required data, three tools were used .**Tool I:** an interview questionnaire that was developed by the researchers based on the literature review. It is composed of two parts: demographic characteristics and health profile of the studied elderly. It was used to assess the characteristics of the studied elderly patients which included age, gender, residence, marital status, educational level, previous occupation, current occupation, living condition, duration of disease (years), current medication, causes of liver cirrhosis, complications from liver cirrhosis and Periodic examination & follow-up.

**Tool II: Modified Self-Management Knowledge Questionnaire (11).**

The second tool was modified by the researcher after reviewing the related literature to suit eastern customs and traditions, as well as this age group. It was used to assess self-management knowledge of the studied elderly patients. The total number of questions on the questionnaire was 13 multiple choice questions; which covered the following: diet, vaccination medication use, and self-monitoring activities. In the current study, it's Cronbach  $\alpha$  was 0.812. Each right answer received a point, while wrong answers and "don't know" received a zero. So that, total score was 13 with cut off at 60%. **The cutoff points for these categories are as follows:**

1. <60% was classified as unsatisfactory knowledge level.
2.  $\geq 60\%$  was classified as satisfactory knowledge level.

**Tool III: Self-management behavior scale for liver cirrhosis patients (12).**

Self-management behavior scale was used to assess self-management behaviors for studied elderly patients with liver cirrhosis. In the current study, it's Cronbach  $\alpha$  was 0.907. It consists of 24 items which comprised of four domains, they are: Dietary management domain that consists of seven items (*Questions 1-7*), Daily life management domain that consists of seven items (*Questions 8-14*), Medication management that consists of five items (*Questions 15-19*) and Illness-monitoring management that consists of five items (*Questions 20-24*). Self-management behavior were scored on a four-point likert-type scale as follows: all the time (4 points), most of the time (3 points), some of the time (2 points), rarely (1 point). Since the available scores might range from the poorest to the best self-management behavior, the possible range was 24-96 points. The mean of the responses to each subscale item was calculated to provide the four domain scores. Then, the mean of the individual's response to all 24 items was calculated to determine the score for overall self-management behavior.

### ***Educational Program***

#### ***Assessment phase:***

Pre-program data collection for baseline assessment was done at this phase. The researcher interviewed each participant who met the study inclusion criteria individually. Then introduced herself, briefly described the purpose of the study, asked for their agreement to participate in it, and assured them that the information they provided was completely confidential and would only be used for research. The researcher read and explained each item of the study scales to the elderly and then recorded his/her response to each item. Each patient's data collection took approximately 25 to 30 minutes to complete. The data were initially analyzed to serve as a basis for developing the educational program in accordance with recognized needs.

#### **Planning phase:**

In light of the results of the data analysis conducted during the assessment phase, and in view of the relevant literature about elderly with liver cirrhosis, as well as according to the needs of the studied elderly and the study's goals, the researcher created the educational program and session's content.

#### **Implementation phase:**

The program was implemented in the study setting in the form of twelve sessions for small groups. This was carried out to increase the opportunities for discussions, interactions. The total sample was divided into small groups (2 to 4 elderly patients in each group). The same teaching strategies, materials, discussions, and booklet were used with all groups to provide the identical contents. The rate of two sessions per month. The length of each session was variable (30 to 45) minutes according to elderly's responses and active participation, as well as the time

available, and the content of each session. The fieldwork was executed over a period of eight months, starting from the beginning of January 2022 up to the end of August 2022; three days per week (Saturday, Monday, and Wednesday) from 9:00 am to 1:00 pm. As one month for pre-test, six months for program sessions; and finally one month for post-test. This included the phases of assessment, planning, implementation, and evaluation of the program.

Each session began with a summary of the information presented in the previous session and the goals of the new one, taking into account the use of straightforward language that suited the understanding level of the studied elderly patients. During the session, motivational and reinforcement strategies like praise and acknowledgment were utilized to increase active involvement and promote learning. In addition to the booklet, the sessions were supported by the use of images, posters, and power point.

#### **Evaluation phase:**

The evaluation of the effectiveness of the educational program (posttest) was done just after completion of the program. These were done using the same data collection tools of the pre-test.

#### ***Ethical Considerations***

The study was approved by the Research Ethics Committee (REC) of the Faculty of Nursing at Zagazig University in December 2021. An informed consent for participation was taken verbally from each of the elderly subjects after being properly informed of its purpose. Participants were given the option to decline participation and informed that they might leave at any time during the data collecting interviews. They were also given the assurance that the information would be kept private and used exclusively for the research purpose.

#### ***Statistical analysis***

The Statistical Package for Social Sciences (SPSS) version 22 was used to organize, tabulate, and statistically analyze the obtained data. For qualitative variables, data were presented as frequencies and percentages, and for quantitative variables, as means and standard deviations. Also, in order to evaluate the study tools' internal consistency and reliability, the Cronbach alpha coefficient was calculated. Chi-square was used to assess the relations between variables and their characteristics. To ascertain whether there are any statistically significant differences between the means of three or more variables with continuous data, the one-way analysis of variance (ANOVA) was utilized. A t test is a statistical test that is used to compare the means of two groups. In order to identify the correlation between the main study variables, Pearson's correlation coefficient was used. Multiple linear regression analysis and analysis of variance for the full regression models were used to determine the independent predictors of the self-management behavior and self-management knowledge scores. Statistical significance was considered at  $p\text{-value} < 0.05$ .

## **Results**

### **Demographic characteristics of the studied elderly Patients (n=80).**

**Table 1** displays that, the mean age the studied elderly patients was  $67.32 \pm 3.5$  years. As regard to gender and marital status, 61.2% and 85% of the studied elderly patients were female and married, respectively. The same table also reveals that 62 % of the studied elderly patients were residing rural area while 38% of them were residing urban areas, respectively. In terms of educational level, 66.3% of the studied elderly patients were illiterate. In concerning to occupation, 53.7% of them weren't work before retirement while 91.2% weren't work currently.

**Health profile of the studied elderly patients (n=80).**

**Table 2** reveals that 57.5% & 50% of the studied elderly patients had liver cirrhosis due to viral hepatitis C and Schistsoma, respectively. Furthermore, this table shows that, about half (51.2%) of the studied elderly patients suffered from liver cirrhosis more than three years ago. Finally; 38.8% & 52.6% of the studied elderly patients had complications related to liver cirrhosis and do follow up only when they felt tired.

#### **Distribution the studied elderly patients according to total self-management knowledge pre and post program**

Referring to Percentage distribution of the studied elderly patients according to total self-management knowledge pre and post program **Figure 1** portrays that, before the program, only 16.3% of the studied elderly patients had satisfactory total self-management knowledge, then improved to be 77.5% had satisfactory total self-management knowledge post- program.

#### **Total mean score of the studied elderly s' self-management behavior pre and post program**

**Table 3** reflects that, there was improvement in total mean score of elderly patients's self-management behavior post program with a highly statistically significant difference ( $P < 0.01$ ) between pre and post educational program. As evidence, total mean score of the studied elderly patients' self-management behavior was  $40.35 \pm 8.7$  pre educational program, but improved to be  $77.4 \pm 10.6$  post educational program.

#### **Best fitting multiple linear regression model for total self-management knowledge score**

**Table 4** demonstrates that, regular examination & follow-up and high education were statistically positive predictors of self-management knowledge score at  $p = .008$  and  $p = .003$ , respectively. As well, positive family history to liver cirrhosis, Current occupation had slight frequency positive effect on total self- management knowledge score at  $p$  value= .036, .043, respectively. While advanced age was statistically negative predictor of self-management knowledge scores. The model explains 52% of the variation at total self-management knowledge score as the value of r-square indicates.

#### **Best fitting multiple linear regression model for self-management behavior score**

**Table 5** illustrates that, high education, female gender, previous hospitalization related to liver cirrhosis were statistically positive predictors of self-management behavior score at  $p = .003$  and .032 respectively. While, having chronic diseases, duration of liver cirrhosis, having complication related to liver cirrhosis and living alone were statistically negative predictors of self-management behavior score. The model explains 56% of the variation in self-management behavior score as the value of r-square indicates.

### **Correlation between self-management knowledge and self-management behavior post program.**

**Table 6** clarifies that, there were highly statistical significant positive correlations between the studied elderly patients' total self-management knowledge and total self-management behavior post program ( $r=0.601$ ) at ( $p < 0.01$ ).

### **Discussion**

The findings of the current study revealed unsatisfactory level of self-management knowledge among studied elderly patients with liver cirrhosis pre the program. As less than one quarter of the studied elderly patients had satisfactory total knowledge pre-program regarding to their self-management. This might be contributing to the majority of the studied elderly patients were illiterate. On the other hand; healthcare professionals in this study's rarely give the participants the chance to inquire about their health issues.

In the same context, findings of a study conducted in Egypt by (9) who illustrates that 62.5% of the studied patients had unsatisfactory knowledge score. Also, these findings are in agreement with study in Vietnam by (13) who found that elderly individuals with liver cirrhosis who were studied had a poorer level of self-management knowledge.

There were statistically significant improvements following the implementation of the current study educational program in the studied elderly's self-management knowledge total score as more than three quarter of them had satisfactory total self-management knowledge post-program. This might be due to the program's content, which concentrated on applied knowledge in clear, concise, accessible language with illustrations and sought to meet the needs and concerns of the participants.

In the same stream, a study conducted in Egypt by (14) who reported that a good educational program had a beneficial effect on participants' self-management knowledge, with 83.7% of the elderly patients in the study having inadequate self-management knowledge prior to the intervention and improving to 16.3% after the intervention. On the same way, a study conducted by (2) in Egypt, who discovered an extremely statistically significant difference between the level of patient self-management knowledge before and after the nursing intervention.

Additionally,(15) in Assiut, Egypt who stated that;prior to the implementation of developing nursing instructions, more than half of the study patients had poor levels of overall self-management knowledge; however, after the implementation of designing nursing instructions, almost all of the study patients had good levels of overall self-management knowledge.

The current study also found that there were several factors influenced the total self-management knowledge of the studied elderly patients. These factors were education level, current occupation, previous family history to liver cirrhosis and periodic examination and follow up. Regarding the relation between demographic characteristics ,medical history and total self-

management knowledge, the current results pointed to there were statistical significant relations between studied elderly patients total self-management knowledge, current occupation , educational level, previous family history to liver cirrhosis and periodic examination and follow up pre and post program with ( $p < 0.05$ ). It is evident that the elderly patients' total self-management knowledge score was higher among those had high educational level, had current occupation, had positive family history to liver cirrhosis and who performed regular examination and follow up.

These findings were further verified by multiple linear regression models in which educational level, current occupation, previous family history to liver cirrhosis and periodic examination and follow up were statistically significant positive predictors of studied elderly patient's total self-management knowledge. On the same way, a study conducted in Australia by (16) who stated that; higher education level, current occupation and regular follow up were associated with good self-management knowledge among liver cirrhosis patients

. Regarding to total mean score of the studied elderly patients self-management behavior pre and post program the current study findings reflects that, there was improvement in total mean score of the studied elderly patients s' self-management behavior post program with a highly statistically significant difference ( $P < 0.01$ ) between pre and post program. As evidence, total mean score of the studied elderly patients s' self-management behavior was  $40.35 \pm 8.7$  pre program, but improved to be  $77.4 \pm 10.6$  post program.

Self-management behavior total mean score decline among studied elderly patients pre educational program may be due to several explanations as majority of the studied elderly had multiple comorbidities associated with liver cirrhosis as hypertension, viral hepatitis diseases and diabetes mellitus. These pathological processes result in serious disruption in self-management behaviors for those patients. As well, the majority of the studied elderly patients resided in rural areas with family members and other relatives who support and assist them in taking care of themselves.

On the other hand, by offering health education tailored to the needs of studied elderly patients, disease awareness and knowledge will be changed positively, leading to improvements in their self-management behavior post program thus enables them to perform complex self-management activities. In addition, the researcher provided them with ongoing encouragement, interaction, and direction as the educational program was being implemented, which may have contributed to the achievement of such results.

In the same context, study carried in Egypt by (17) & (18) who revealed that; the use of a self-care management program significantly and favorably affected the examined geriatric patients with chronic liver diseases s' knowledge and practice among their self-care. Also, these findings go in the same line with a study done in USA by (19) who demonstrated that after the implementation of nursing interventions, patients with chronic liver failure undergoing liver transplantation substantially engaged in a variety of self-management behaviors.



Additionally, in accordance with this finding, a study conducted in El-Behaira Governorate, Egypt illustrated that, the study's female elderly patients' self-management behaviors significantly improved after the implementation of nursing interventions; while total mean of self-management behaviors rising from  $38.40 \pm 5.17$  pre interventions to  $56.40 \pm 11.17$  post interventions (2).

On the contrary, these previous findings disagreed with recent study in Chengdu, Sichuan Province, China; who reported that the total mean of self-management behavior of persons with liver cirrhosis score in the study was 69.58 which indicates that the participants in this study had better self-management with some of the dimensions of self-management being high; however, there were also some low-scoring dimensions (20).

**Focusing on components of self-management behaviors among older patients under study** (dietary management, daily life management, medication management and illness monitoring management), the results of the current study showed that all self-management behaviors significantly improved after implementation of the educational program.

As regarding to dietary management of studied elderly patients, the current study's findings found that, there was a marked improvement in total mean score for dietary management among the elderly patients under study while total mean was  $11.7 \pm 1.46$  before the educational program but rose to  $23.43 \pm 5.08$  after it with a highly statistically significant difference ( $P < 0.01$ ) pre and post program.

Such results might be due to several explanations since most of the older patients in the study had inadequate nutritional knowledge before undergoing the educational program. For examples, more than two third of the studied elderly patients had in correct answer about proper diet and the numbers of recommended meals per day, respectively .Also, and most of them don't know which food should be restricted to liver cirrhotic patients with hepatic encephalopathy.

Furthermore, patients with liver cirrhosis frequently have limited appetites, and salty foods appeal to them more than low-salt foods . Additionally, a lot of meals are prepared using animal offal, which is higher in fat and cholesterol. These issues were addressed during the educational program by instructing the elderly patients being studied to limit their sodium intake to less than 2 grams per day and use alternatives to salt like vinegar and lemon juice, limit their intake of high-fat foods like fat, butter, and ice cream, and take into account age-related changes by consuming easily digestible diet.

Likewise, the finding of a study conducted in China and demonstrated that deficiencies in a number of self-management behaviors; for instance, participants reported poor nutrition management and poor disease monitoring management. (11). Besides, (21) in China who reported that nutritional dysfunction exists in patients with liver cirrhosis. Additionally, previous findings were in same line with the research study done by (2), who demonstrated that post-nursing interventions, dietary management significantly improved compared to the beginning of the study; the mean score for dietary management was  $11.60 \pm 2.94$  before interventions while became  $17.40 \pm 3.87$  after it.

Referring to daily life management of studied elderly patients, the present study findings explained that, there was a marked enhancement in total means scores of studied elderly's self-management behavior related to daily life management post program. As total mean score was  $13.11 \pm 2.7$  before while became  $23.88 \pm 0.42$  post educational program. This could be due to age related changes in all body organs among studied elderly patients with liver cirrhosis associated with weaker self-care behaviors and lower willingness to learn, practice, and sustain self-care for themselves.

Furthermore, it is believed that the majority of the elderly patients in the study had chronic illnesses that eventually interfered with their ability to carry out daily life activities and made them more dependent on others for assistance with daily life activities is another explanation for the decrease in daily life practices among studied elderly patients.

This findings is supported by study carried in China by (20) & (22) in who interpreted that, persons with liver cirrhosis scored lower for daily life management than for medication management and illness-monitoring management. Moreover, (23) who found that after the educational program had been implemented; the study group's ADL scores were significantly higher than those of the control group. As patients' sense of control over their life and diseases is considerably increased by health education.

**Regarding to Medication Management** of studied elderly patients, the present study findings referred that, there was an obvious improvement in total means scores of studied elderly's self-management behavior related to medication management post program. As total mean score was  $8.05 \pm 1.3$  before educational program while became  $15.68 \pm 3.60$  post educational program. It might be due to doctors frequently spend less time educating patients about prescription medications when they are treating older patients with liver cirrhosis. Also, because most patients have other chronic diseases associated with liver cirrhosis and take many medications. Additionally, more than two third of them were illiterate and belonged to rural areas so had insufficient knowledge about the medicines prohibited for patients with liver cirrhosis.

On the same line the previous findings go with (11) who mentioned that healthcare professionals should provide detailed instructions on which medications are appropriate for individuals with liver cirrhosis and ought to discuss with physicians before administering them. Conversely, these previous results disagree with (20), who found that compared to other self-management behavior domains, individuals' scores on medication management were the highest.

**With respect to Illness-Monitoring Management** of studied elderly patients, the current study discovered that the implementation of the educational program had a substantial impact on the mean scores of illness-monitoring management of studied elderly patients from  $7.49 \pm 2.58$  before the educational program to became  $14.41 \pm 3.99$  after it. This could be due to follow-up, and illness monitoring requires knowledge of the follow-up program (significance, timing, place, and nature of the examination), as well as the services and resources that are offered and any potential problems that could arise from lack regular follow up. However, the studied elderly

patients had a deficiency in their self-management knowledge regarding their illness. Additionally; these previous aspects were emphasized during the sessions of the educational program.

The foregoing result was in the same line with studies as (2) & (23) who found that patients with liver cirrhosis who underwent educational interventions had considerably better health maintenance and disease monitoring. On the other hand, the current study findings inconsistent with (20) who stated that the illness-monitoring management score was 14.17 (SD = 2.21) which was a better score than for other dimensions of self-management behavior scale among liver cirrhosis patients.

The current study also found that there were several factors influenced the total self-management behavior mean score of the studied elderly patients. These factors were chronic disease, duration of diseases, complications related to liver cirrhosis, previous hospitalization related to liver cirrhosis, gender, educational level and living conditions.

It is evident that the studied elderly patients' total self-management behavior mean score was lower among those had chronic disease, had complications related to liver cirrhosis and who living alone. These findings were further verified by multiple linear regression models in which above mentioned factors were statistically significant negative predictors of studied elderly patient's self-management behavior score.

On the contrary, the current study findings illustrated that, the elderly patients' total self-management behavior score was higher among female gender & high educational patients, those had long duration of disease, and who had previous hospitalization related to liver cirrhosis. These findings were further verified by multiple linear regression models in which above mentioned factors were statistically significant positive predictors of studied elderly patient's self-management behavior score. Furthermore, the previous study findings go in the same line with (2) who reported that the main factors affected positively on self-management behaviors of geriatric patients with liver cirrhosis were female gender and high educational level.

According to the current study results, there was a statistically significant positive correlation between total knowledge and total self-management behavior at ( $p < 0.01$ ). These findings suggested that satisfactory total self-management knowledge has a direct impact on improving the studied elderly patients' self-management behavior in elderly patients with liver cirrhosis. In accordance with this finding, a study conducted in China by (24) & (25) in Japan and the Egyptian study conducted by (26) who reported that a strong positive association between self-management knowledge and self-management behavior and in hospitalized patients with liver cirrhosis.

## Conclusion

The study findings was concluded that pre the educational program the studied elderly patients had unsatisfactory self-management knowledge and inadequate self-management behavior. The applied educational program was effective in improving studied elderly patients self-management knowledge and self-management behavior. The elderly patients' total self-

management knowledge score was higher among those had high educational level, had current occupation, had positive family history to liver cirrhosis and who performed regular examination and follow up. Also, the studied elderly patients' total self-management behavior score was higher among female gender patients & high educational patients, those had long duration of disease, and who had previous hospitalization related to liver cirrhosis. Therefore, the educational program was effective and could be used to increase level of patients' self-management knowledge and improve self-management behavior in elderly patients with liver cirrhosis.

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### Declaration of Conflicting Interests

The Author(s) declare(s) that there is no conflict of interest.

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Table (1): Demographic characteristics of the studied elderly Patients (n=80)

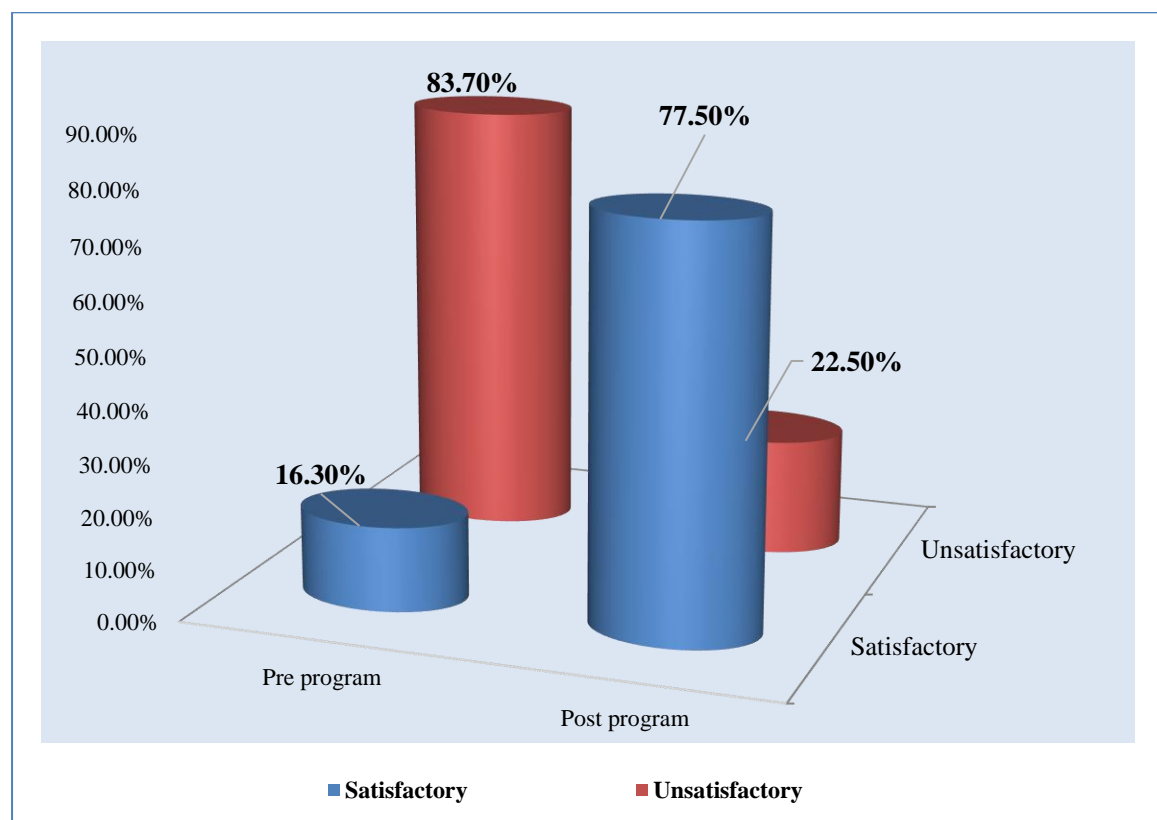
Items	(n=80)	
	Frequency	Percent
Age group: /year		
60- <70	64	80.0
70- 80	16	20.0
Mean $\pm$ SD (range)	67.32 $\pm$ 3.5 (60 – 78)	
Gender:		
Male	31	38.8
Female	49	61.2
Residence:		
Rural area	50	62.5
Urban	30	37.5

<b>Marital status:</b>		
Married	68	85.0
Divorced	4	5.0
Widow	8	10.0
<b>Educational level:</b>		
Illiterate	53	66.3
Read & write	10	12.5
Primary education	7	8.8
Secondary education	5	6.2
University education	5	6.2
<b>Occupation before retirement:</b>		
Work	37	46.3
Not work	43	53.7
<b>Current occupation:</b>		
Work	7	8.8
Not work	73	91.2
<b>Living Condition: *</b>		
Husband / Wife	64	80.0
Son / Daughter	16	20.0

Table (2): Health profile of the studied elderly patients (n=80)

Items	(n=80)	
	Frequency	Percent
<b>Causes of liver cirrhosis: *</b>		
Hepatitis B	30	37.5
Hepatitis C	46	57.5
Nonalcoholic fatty liver diseases	12	15.0
Schistosomiasis	40	50.0
<b>Duration of diseases/year:</b>		
Less than 1 year	16	20
1-3	23	28.8
3 years or more.	41	51.2

<b>Having complications related liver cirrhosis:</b>		
Yes	31	38.8
No	49	61.2
<b>Examination and follow-up with the doctor regularly:</b>		
Yes	42	52.5
No	38	47.5
<b>Time of follow up (n=42)</b>		
Two weeks	12	28.6
Month	15	35.7
Two to Six month	15	35.7
<b>Reasons of un follow up (n=38)*:</b>		
Only when I feel tired	20	52.6
Difficulty in transportation	6	15.8
Crowded clinics	3	7.9
Financial inability	9	23.7



**Figure (1):** Distribution the studied elderly patients according to total self-management knowledge pre and post program (n=80).

**Table (3):** Total mean score of the studied elderly s' self-management behavior and its' domains pre and post program (n=80)

<i>Domains</i>	Pre (n=80)	Post (n=80)	T-test	(p-value)
	Mean ± SD	Mean ± SD		
Dietary Management	11.7±1.46	23.43 ± 5.08	20.74	0.000**
Daily life Management	13.11±2.7	23.88±0.42	23.88	0.000**
Medication Management	8.05±1.3	15.68±3.60	19.72	0.000**
Illness monitoring Management	7.49±2.58	14.41±3.99	16.36	0.000**
Total	40.35±8.7	77.4±10.6	39.27	0.000**

(\*\*) Highly significant at  $p < 0.01$  (\*) statistically significant at  $p < 0.05$

**Table (4):** Best fitting multiple linear regression model for total self-management knowledge score

Items	Unstandardized Coefficients		Standardized Coefficients	T test	P. value
	B		B		
Examination & follow-up ** (yes)	.250		.198	3.976	.008**
Family history to liver cirrhosis. (yes)	.261		.198	2.801	.036*
Current occupation (Work)	.170		.112	2.261	.043*
Education** "High"	.350		.301	5.618	.003**
Age	-.159		.086	2.132	.047*

Model	R <sup>2</sup>	Df.		F	P. value
Regression	0.52	4		10.671	.000**

a. Dependent Variable: Self- management knowledge

b. Predictors: (constant): Age group, Education (High), Current occupation (Work), Positive family history to liver cirrhosis, Examination and follow-up .

Table (5): Best fitting multiple linear regression models for self-management behavior score.

Items	Unstandardized Coefficients		Standardized Coefficients	T test	P. value
	B		B		
Have chronic diseases (yes)	-.201		.142	2.336	.041*
Duration of disease / years	.194		.132	2.560	.036*
Complications related cirrhosis of the liver (yes)	-.250		.198	3.776	.012*
Previous hospitalized related liver cirrhosis (yes)	.238		.185	2.998	.032*
Gender (Female)	.173		.116	2.431	.039*
Education** "High"	.350		.301	5.618	.003**
Living Condition (alone)	-.200		.135	3.110	.021*
Model	R <sup>2</sup>	Df.		F	P. value
Regression	0.56	6		11.290	.000**

a. Dependent Variable: Self-management behavior

b. Predictors: (constant): Have chronic diseases (yes), Duration of disease / years, Complications related cirrhosis of the liver (yes), Previous hospitalized related liver cirrhosis (yes), Gender (Female), Education\*\* "High", Life with whom (alone).



**Table (6):** Correlation between self-management knowledge and self-management behavior post program.

Variables	self-management knowledge	self-management behavior
self-management knowledge		r. 0.601 p. 0.003**
self- management behavior	r. 0.601 p. 0.003**	

r = Correlation coefficient. \*Significant at  $p < .05$ . \*\*Highly significant at  $p < .01$ .

## References

- [1] Welch, N., Attaway, A., Bellar, A., Alkhafaji, H., Vural, A., & Dasarathy, S. Compound sarcopenia in hospitalized patients with cirrhosis worsens outcomes with increasing age. *Nutrients*. 2021; 13(2): 1-16.
- [2] Alfauomy, N. A., Elshazly, S. A. M., Moneam, A. E., & Abd El Galeel, A. Effect of Nursing Interventions on Self-management Behaviors of female Geriatric patients with Liver Cirrhosis. *Alexandria Scientific Nursing Journal*. 2020; 22(2): 1-18.
- [3] Johnston, H. E., Takefala, T. G., Kelly, J. T., Keating, S. E., Coombes, J. S., Macdonald, G. A., ... & Mayr, H. L. The effect of diet and exercise interventions on body composition in liver cirrhosis: a systematic review. *Nutrients*. 2022; 14(3365):1-28.
- [4] O'Connell, M. B., Bendtsen, F., Nørholm, V., Brødsgaard, A., & Kimer, N. Nurse-assisted and multidisciplinary outpatient follow-up among patients with decompensated liver cirrhosis: A systematic review. *Plos one*. 2023;18(2): 1-19.
- [5] Valery, P. C., Bernardes, C. M., Hayward, K. L., Hartel, G., Haynes, K., Gordon, L. G., ... & Powell, E. E. Poor disease knowledge is associated with higher healthcare service use and costs among patients with cirrhosis: an exploratory study. *BMC gastroenterology*. 2022;22(1): 340-360.
- [6] Valizadeh, A., & Aghebati, N. Development and evaluation of a self-care smartphone application for cirrhotic patients. *Evidence Based Care*. 2019 ;9(3): 32-40.
- [7] Pranata, S., & Wulandari, H. A concept analysis of Self-management among diabetes mellitus. *International Journal of Nursing and Health Services (IJNHS)*. 2021; 4(3):356-367.

- [8] Hjorth, M., Svanberg, A., Sjöberg, D., Rorsman, F., & Kaminsky, E. Liver cirrhosis turns life into an unpredictable roller coaster: A qualitative interview study. *Journal of Clinical Nursing*. 2020;29(23-24): 4532-4543.
- [9] Mahmoud, T. A., Abdallah, K. F., Mahmoud, M. H., & Taha, A. S. Assessment of Acute Hepatitis C patients' Performance regarding Self-Care Management for Complications Prevention. *Journal of Nursing Science Benha University*. 2020;1 (1): 19-39.
- [10] Zandi, M., Adib-Hajbagheri, M., Memarian, R., Nejhad, A. K., & Alavian, S. M. Effects of a self-care program on quality of life of cirrhotic patients referring to Tehran Hepatitis Center. *Health and quality of life outcomes*. 2005;3(1): 1-8.
- [11] Dong, N., Chen, W. T., Bao, M., Lu, Y., Qian, Y., & Lu, H. Self-Management behaviors among patients with liver cirrhosis in Shanghai, China: a cross-sectional study. *Clinical nursing research*. 2020; 29(7): 448-459.
- [12] Wang, Q., Wang, Y., Gao, J., Han, J. T., & Li, Y. P. Development of a self-management behaviour scale for liver cirrhosis. *International Journal of Nursing Sciences*. 2015 ;2(1):73-79.
- [13] Thuy, T. X. Patient Knowledge about Disease Self-Management of Cirrhosis. Unpublished Master of Science in Nursing thesis, University of Northern, Colorado; 2019.
- [14] Sabola, N. E., Elshikh, A. A., El-Nagar, S. A., & Elshebny, N. H. Effect of a Designed Nursing Intervention on Knowledge and Fatigue among Patients with Liver Cirrhosis. *Menoufia Nursing Journal*. 2022; 7(2): 411-431.
- [15] Mobed, K. B., Mekawy, M. M., Makhlof, N. A., & Abd Almageed, A. S. Impact of Designing Nursing Instructions on Knowledge and Activity of Daily Living for Cirrhotic Patients With Ascites. *Assiut Scientific Nursing Journal*. 2019; 7(19): 1-8.
- [16] Hayward, K. L., Horsfall, L. U., Ruffin, B. J., Cottrell, W. N., Chachay, V. S., Irvine, K. M., ... & Valery, P. C. (2017). Optimising care of patients with chronic disease: patient-oriented education may improve disease knowledge and self-management. *Internal medicine journal*, 47(8), 952-955.
- [17] Hussein, H. A. The Effect of Self-Care Management Program on Dealing with Stressors Perceived by Geriatric Patients with Chronic Liver Diseases. *Journal of Nursing and Health Science*. 2019;8(1): 1-17.
- [18] Mohamed, S., & Mostafa, H. The effects of educational intervention on self-care behavior and expected clinical outcome in patient undergoing liver transplantation. *Journal of Nursing Education and Practice*. 2018; 8(9): 102-112.
- [19] Ko, D., Bratzke, L. C., Muehrer, R. J., & Brown, R. Self-management in liver transplantation. *Applied Nursing Research*. 2019; 45: 30-38.
- [20] Guo, L., Li, L., Lu, Y., Li, T., Chen, L., Jiang, L., ... & Yuan. Effects of empowerment education on the self-management and self-efficacy of liver transplant patients: a randomized controlled trial. *BMC nursing*. 2023; 22(1): 1-11.

- [21] Ban, L., YU, S., Hua, X., Wang, W., Zou, Y., Zhao, Y., & Zhao, Q. Contrast analysis of nutritional status between patients of alcoholic cirrhosis and viral cirrhosis. *Parenteral & Enteral Nutrition*. 2017; 105-108.
- [22] Tandon, P., & Berzigotti, A. Management of lifestyle factors in individuals with cirrhosis: A pragmatic review. In *Seminars in liver disease*.2020; 40(1):020-028.
- [23] Zhang, X., Xi, W., Liu, L., & Wang, L. Improvement in quality of life and activities of daily living in patients with liver cirrhosis with the use of health education and patient health empowerment. *Medical science monitor: international medical journal of experimental and clinical research*. 2019; 25: 4602-6408.
- [24] Ren, H., Liu, C., Wang, R., Zhang, M., Tang, L., & Liu, F. Self-management behavior and its influencing factors of patients with cirrhosis: A cross-sectional survey. *West China Medical Journal*. 2018; 33(5): 574-578.
- [25] Cui, Y. A., Moriyama, M., Chayama, K., Liu, Y., Ya, C., Muzembo, B. A., & Rahman, M. M. Efficacy of a self-management program in patients with chronic viral hepatitis in China. *BMC nursing*. 2019; 18(1): 1-12.
- [26] Hussein, H. A. The Effect of Self-Care Management Program on Dealing with Stressors Perceived by Geriatric Patients with Chronic Liver Diseases. *Journal of Nursing and Health Science*.2019; 8(1):1-17.