Impact of Implementing Self-care Protocol on Improving Quality of Life of Patients with Liver Cirrhosis

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Abstract: Background: Cirrhosis and its related complications remain a prominent global health concern despite advances in understanding and treating the disorder. Because of its chronic and irreversible nature, it needs self-care protocols to be developed according to patient's needs to increase patient's knowledge about self-care that reflect improvement of their quality of life. **Aim of this study** was to evaluate the impact of implementing self-care protocol on improving quality of life of patients with liver cirrhosis. **Design:** quasi-experimental research design was utilized. **Setting:** This study was conducted in the hepatology unit at the Specialized Medical Hospital and the tropical medicine unit at Mansoura University Hospital. **Subjects**: This study was carried out on 44 male and female adult patients with liver cirrhosis classified as class B on Child-Pugh classification. **Tools:** Data were collected using three tools; Demographic & Medical health status data sheet, Patient's knowledge about liver cirrhosis questionnaire sheet, and Chronic Liver Disease Questionnaire (CLDQ). **Results:** The present study revealed significant improvement in both patient's knowledge and quality of life score after implementation of the self-care protocol. **Conclusion:** there was a positive improvement of patient's quality of life as a result of improving their knowledge about self-care. **Recommendations:** providing liver cirrhotic patients in hepatology units with continuous education about self-care to overcome symptoms and complications of the disease and thus improve their quality of life.

Key words: Self-care protocol, Quality of life, Liver cirrhosis

1. Introduction:

Liver cirrhosis is one of the major causes of morbidity and mortality. In 2010, liver cirrhosis was the 23rd cause of death worldwide [1]. The Global Burden of Disease (GBD) reported that over one million people died due to cirrhosis in 2010 worldwide, compared with 676,000 deaths in 1980 [2]. Egypt had the highest age-standardized mortality rate for cirrhosis [3, 4].

Liver cirrhosis is the final result of chronic parenchymal distortion, cell loss, fibrous band formation, and nodule formation, with shrinkage of the liver [5]. It is started by an asymptomatic stage "compensated cirrhosis", followed by "decompensated cirrhosis", which marked by the development of complications [6]. Patients may experience fatigue, muscle cramps, pruritus, bleeding, anorexia, nausea, and vomiting, anxiety, depression, and other emotional problems that affect patient's quality of life [7].

There is no specific cure for cirrhosis. Therefore, the goal of treatment is to minimize the progression of the disease and to prevent complications. In this context, nurses have a major role in the multidisciplinary team because they perform comprehensive and continuous patient care. Nursing care goals may include prevention of complications; promotion, maintenance, and restoration of health; facilitating optimal functional ability in the patients'

desired roles, maximizing well-being, and promoting patient satisfaction [8].

Assessment of patient's knowledge about disease process is necessary. Planning short and simple self-care protocols has a significant effect on the patient's control of their disease and its side effects; and can improve their quality of life and life satisfaction [9].

Significance of the study:

Liver cirrhosis is considered a major health problem in various countries and regions. In Egypt there is no doubt that liver cirrhosis is a major health concern. The growing prevalence of liver cirrhosis is due to the increasing burden of its risk factors. Hepatitis B virus and hepatitis C virus are the two major causes of liver cirrhosis. Hepatitis C virus prevalence among the 15−59 years age group is estimated to be 14.7%. Accordingly, Egypt has the highest HCV prevalence in the world. Today, HCV infection and its complications such as, liver cirrhosis are among the leading public health challenges in Egypt [10].

According to the statistical records of Mansoura Specialized Medical Hospital, it was noted that the number of patients have liver diseases, admitted to the hospital in the year 2016 was 4889 patients. Approximately, about 78% of patients admitted with liver cirrhosis. Unfortunately, there is no systematic and organized educational program is now existed for

patients with liver cirrhosis. Therefore, the current study was carried out to evaluate the impact of self-care protocol on improving quality of life of patients with liver cirrhosis.

2. Aim of the study:
The aim of the study was to evaluate the impact of implementing self-care protocol on improving quality of life of patients with liver cirrhosis.

3. Hypothesis:
H1. Patients who will participate in the self-care protocol will have better knowledge scores than prior participation.

H2. Patients who will participate in the self-care protocol will demonstrate an improvement in their quality of life scores as compared to prior participation.

H3. There will be statistically significant positive correlation between knowledge score and quality of life score among the studied patients post participation in the self-care protocol.

4. Method:
Subjects and method of this study were discussed under the following four main designs; technical, administrative, operational, and statistical design.

4.1 - Technical design:
Quasi experimental research design was used in this study on 44 adult male and female patients with inclusion criteria of having a confirmed diagnosis of liver cirrhosis, Class "B" on Child-Pugh classification, willing and give their consent for participation in the study. Patients with hepatic cell carcinoma, end stage liver disease, mental illness, and unconscious patients were excluded. The study conducted in the hepatology unit at the Specialized Medical Hospital and the tropical medicine unit at Mansoura University Hospital, which are affiliated to Mansoura University Hospitals and follow rules & regulations of Mansoura University Hospitals.

Tools: Threetools were used:

Tool 1: Demographic and Medical health status data sheet: This tool was developed by the investigator after reviewing the related recent national and international literature and consists of three main parts.

Part A: Demographic characteristics, this part includes demographic characteristics of patients such as (age, sex, marital status, level of education, occupation, and monthly income).

Part B: Medical health status data such as; duration & detection of the disease, frequency of previous hospitalization, and cause of hospitalization.

Part C: Child-Pugh classification of cirrhosis.

Tool II: Patient's knowledge about liver cirrhosis questionnaire sheet: this tool was developed after reviewing the related recent national and international literature by the investigator. It was divided into four

main heading; general knowledge about liver cirrhosis, Symptoms of liver cirrhosis & ways to overcome it, complications of liver cirrhosis & ways for prevention, and Medications that used with liver cirrhosis.

Scoring of patient's knowledge questionnaire sheet: Each question had a group of answers points, each correct answer was given one degree, while wrong, missed, or unknown answer was given zero. Every question may contain one or more correct answer. The scores obtained for each question was summed up to get the total score for patient's knowledge about liver cirrhosis.

The total knowledge score was distributed as follows:

Scale	%	Score
Poor	< 50%	< 45.5 degree
Fair	50 - 75%	45.5 – 68.25 degree
Good	≥ 75%	≥ 68.25

Tool III: Chronic liver disease questionnaire (CLDQ) [11]: disease-specific instrument to assess health-related quality of life (HRQL) in patients with chronic liver disease, developed by *(Younnosi et al., 1999).* It is adapted into English form and translated into Arabic form by the investigator. The CLDQ included 29 items in the following six domains: (abdominal symptoms, fatigue, systemic symptoms, activity, emotional function and worry) and it has 7 likert scale and modified by the investigator to 5 likert scale after pilot study.

Scoring system for Chronic liver disease questionnaire (CLDQ): scores for each domain were summed to create a total score ranging from (29-145) from worst to best quality of life.

The total quality of life score was distributed as follows:

Scale	%	Score
Inadequate	< 60%	< 87
Adequate	≥ 60%	≥ 87

4.2-Administrative design: to carry out the study, an official approval was obtained from Faculty of Nursing, Mansoura University as well as, the Ethical Committee of Faculty of Nursing. Also, an official approval for conducting the study was obtained from the responsible administrative personnel of Mansoura University Hospital and the Specialized Medical Hospital, which are affiliated to Mansoura University Hospitals based on an official letter from the Faculty of Nursing, which include the title and aim of the study. An informed consent was obtained from patients who accepted to participate in the study after illustrating aim and nature of the study. The

investigator assured the patients that participation in the study is voluntary and they have the right to withdraw at any time. The study tools were tested for its validity by a seven experts in medical and nursing fields for its relevance, comprehensiveness, clarity, and applicability. After that, the necessary modifications were done accordingly.

4.3- Operational design:

A pilot study was carried out on 10% of sample and they were excluded from the total studied subjects in order to test the clarity, feasibility, correctness, and applicability of the study tools. It also, provided an estimate of the time needed for answering the questionnaire sheets. Then, the reliability of the study tools was assessed to measure the internal consistency of the study tools. Data was collected through 3 phases; preparation, implementation, and evaluation phase.

Preparatory phase: A review of the past, current, national and international literature related to the various aspects of the study was done using books, articles, periodicals, internet, and magazines. Preparation was included developing tool I, II, translating tool III, and developing self-care protocol for patients about liver cirrhosis according to patient's gap of knowledge and extensive literature review to provide patients with information about liver cirrhosis, in order to increase their awareness to reduce the severity of symptoms of the disease and prevent complications as possible.

Implementation phase: During this phase, the investigator recruited the patients who fulfilled the inclusion criteria from inpatient departments at the previously mentioned settings, then introduced herself to each patient and explain the aim and nature of the study for each patient. Consent approval was obtained from each patient included in the study. The investigator interviewed each patient individually to fulfill the study tools (pretest). The investigator implement the self-care protocol in the form of four teaching sessions to each patient. The investigator with patients arranged sessions times and dates according to their free times. Each patient chose the optimal time for receiving the teaching sessions whenever they have ready to learn. The duration of each session ranged from 30-45 minutes and varied according to level of understanding for each patient and content of each session. After completion of all sessions, the investigator interviewing patients to fill tool II immediately (posttest). Also, tool III was filled again one month after implementation of the self-care protocol (posttest).

Evaluation phase: This phase focused on evaluating the impact of the self-care protocol through using the same tools which used in the pre and posttests (tool II & III) after two months from implementing the self-care protocol for follow up of patients' quality of life and knowledge about liver cirrhosis.

Ethical consideration:

The investigator took into consideration all relevant ethical issues including the following; an official approval was obtained to conduct the study, aim & nature of the study was explained to each patient then consent was obtained from each patient participated in the study, patient's privacy and confidentiality of the collected data were maintained, and patients were assured that their information would be used only for research purposes and they have right to withdraw from the study at any time without any penalty.

4.4- Statistical analysis:

After data collection, it was revised, coded and fed to Statistical Package for the Social Sciences version 20.0. Results were presented as mean ±standard deviation, number & percentage. One Way ANOVA, chi square, and Pearson correlation analysis were used to test the statistical significance of some variables. The P value of < 0.05 indicate a significant result while, P value > 0.05 indicates a non-significant result.

5- Results:

This part represents the current study findings regarding the impact of implementing self-care protocol on improving quality of life of patients with liver cirrhosis. Findings of the present study illustrated that More than half (54.5%) of studied patients were females. Their ages ranged from 40 to 60 years old with mean age 53.1 ±5.2 years. Concerning marital status, More than two thirds of patients (68.2%) were married. Regarding educational level, 52.3% of patients were illiterate. In relation to occupation, 54.5% of the patients weren't employed. Finally, more than half (54.5%) of patients had sufficient income. Regarding disease duration, more than two fifths (47.7%) of patients having the disease from (6-10) years with a mean duration (9.00 ±4.4) years and more than three quarters (77.3%) of them detected their disease by the presence of symptoms. regarding previous hospitalization, more than two fifths (40.9%) of patients weren't previously hospitalized and 36.4% were previously hospitalized from 1 to 2 times. Moreover, more than half (61.5%) of previously hospitalized patients stayed on hospital for more than one week. Concerning presence of co-morbidities, more than half (52.3%) of the studied patients suffering from co-morbidities and hypertension were the most prevailing disease (91.3%) among them.

Figure (1) shows total Patient's knowledge score about liver cirrhosis. It is observed that, more than two thirds (68.2%) of patients had "poor" knowledge score

before implementing the self-care protocol, which improved to be "good" in almost four fifths (79.5%) of patients immediately after implementing the self-care protocol and 43.2% of them 2 months following implementation.

Table (1) represents total mean score of studied patients' responses regarding quality of life domains. It is obvious that there was a significant improvement in patients' responses regarding quality of life domains one month post implementing the self-care protocol about liver cirrhosis (Mean ± SD =117.75±19.6) and two months post implementation (Mean ± SD =102.64 ±18.0), compared to pre implementation (Mean ± SD =74.95±18.8) at (p <0.001).

Figure (2) reveals total patient's quality of life score. It is clear that more than two thirds (72.2%) of patients had "inadequate" quality of life score before implementing the self-care protocol, which improved to be "adequate" in three quarters (75%) of patients one month post implementing the self-care protocol and more than half (61.4%) of them two months following implementation.

Table (2) show relation between demographic characteristics and studied patient's quality of life (QOL). It is obvious that patients in age group from (51-60) years old obtained inadequate QOL score than in age group from (40-50) years old. Additionally, married patients obtained adequate QOL score than

divorced and widow patients. Moreover, illiterate patients obtained inadequate QOL score than patients with high and intermediate educational level. Also, employed patients obtained adequate QOL score than non-employed patients. Finally, patients with sufficient income obtained adequate QOL score than patients with insufficient income.

Table (3) represents relation between medical health status data and studied patient's quality of life (QOL). It is obvious that patients whose duration of illness ranged from (1-10) years obtained adequate QOL score than whose duration of illness ranged from (11-16) years or more. Additionally, patients who detect their illness by symptoms obtained inadequate QOL score than who detect their illness by chance. Moreover, patients who didn't previously hospitalized obtained adequate QOL score than previously hospitalized patients. Finally, patients who didn't have co-morbidities had adequate QOL score than who had co-morbidities.

Figure (3, 4 & 5) shows correlation between knowledge score and quality of life score pre, post, and 2 months following implementation of the self-care protocol. These underlying figures pointed that, there was a statistically significant positive correlation between knowledge score and quality of life score pre, post, and 2 months following implementation of the self-care protocol about liver cirrhosis at (p< 0.001).
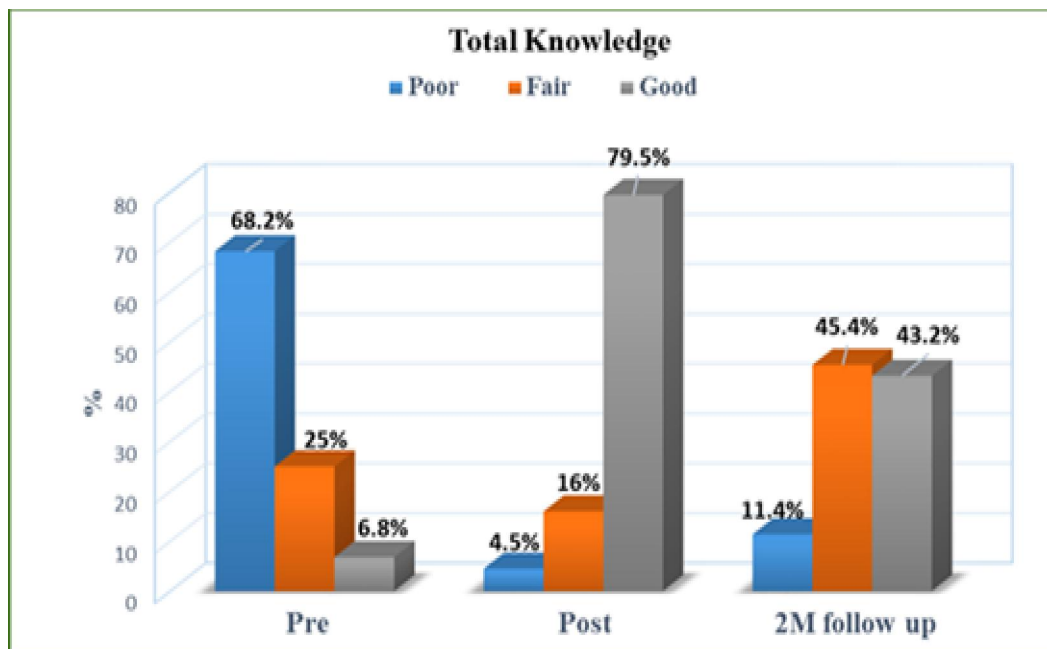

Figure (1): Total Patient's knowledge Score pre, post, and months (2M) following implementation of the self-care protocol

Table 1. Total mean score of patients' responses regarding quality of life domains pre, 1 month (1M) post, and 2 months (2M) following implementation of the self-care protocol

|	Pre	1Month Post	2Months Follow up	ANOVA test	
	Mean ±SD	Mean ±SD	Mean ±SD	F	P
Abdominal symptoms	6.50 ±2.7	11.86 ±2.5	9.84 ±2.5	49.810	<0.001*
Fatigue	11.14 ±3.9	19.25 ±3.5	16.50 ±3.6	54.774	<0.001*
Systemic symptoms	12.98 ±3.4	20.09 ±4.2	17.45 ±3.4	41.674	<0.001*
Activity	7.02 ±2.5	11.20 ±2.6	9.66 ±2.5	30.068	<0.001*
Emotional function	23.57 ±6.8	35.09 ±6.0	31.30 ±6.0	38.591	<0.001*
Worry	13.61 ±2.5	20.32 ±2.7	17.86 ±2.6	74.456	<0.001*
Total QOL score	**74.95±18.8**	**117.75±19.6**	**102.64 ±18.0**	**58.666**	**<0.001***
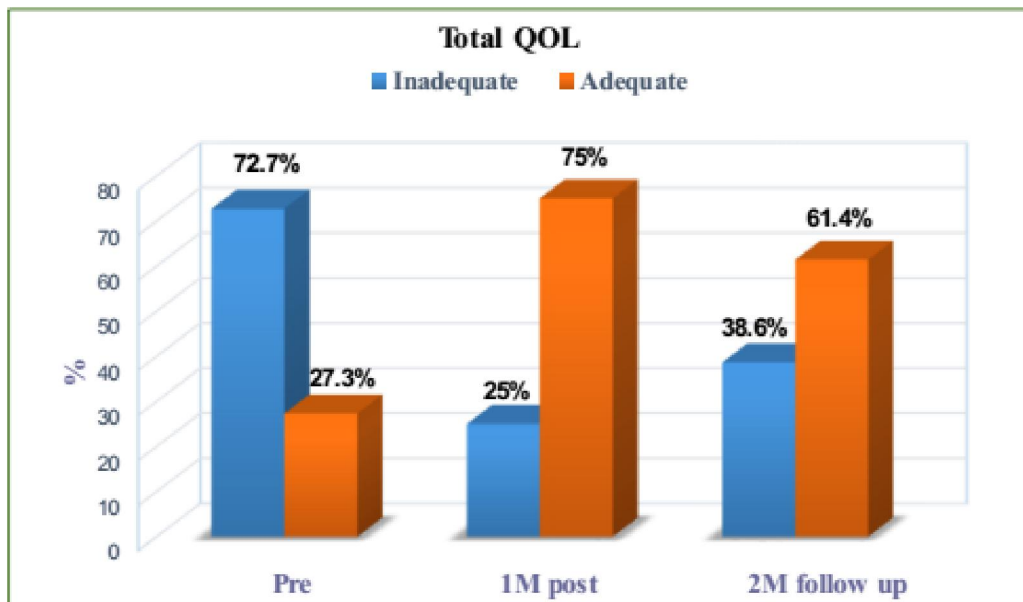
Figure (2): Total Patient's quality of life score pre, 1 month (1M), and 2 months (2M). Following implementation of the self-care protocol

Table 2. Relation between demographic characteristics and studied patient's quality of life.

	Pre				One month Post				Two months follow up			
	Inadequate		Adequate		Inadequate		Adequate		Inadequate		Adequate	
	N	%	N	%								
Age (years)												
40 – 50	7	15.9	8	18.2	0	0.0	15	34.1	1	2.3	14	31.8
51 – 60	25	56.8	4	9.1	11	25.0	18	40.9	16	36.4	13	29.5
Chi square test	**X2= 7.793 P=.005***				**X2= 7.586 P=.006***				**X2= 9.811 P=.002***			
Sex												
Males	12	27.3	8	18.2	4	9.1	16	36.4	6	13.6	14	31.8
Females	20	45.5	4	9.1	7	15.9	17	38.6	11	25.0	13	29.5
Chi square test	**X2= 2.994 P=.084**				**X2=.489 P=.484**				**X2= 1.154 P=.283**			
Marital status												
Married	19	43.2	11	25	4	9.1	26	59.1	7	15.9	23	52.3
Divorced	3	6.8	0	0.0	1	2.3	2	4.5	2	4.5	1	2.3
Widow	10	22.7	1	2.3	6	13.6	5	11.4	8	18.2	3	6.8
Chi square test	**X2= 4.293 P=.177**				**X2= 7.410 P=.025***				**X2= 9.350 P=.009***			
Education												
Illiterate	23	52.3	0	0.0	10	22.7	13	29.5	16	36.4	7	15.9

	Pre				One month Post				Two months follow up			
	Inadequate		Adequate		Inadequate		Adequate		Inadequate		Adequate	
	N	%	N	%	N	%	N	%	N	%	N	%
Intermediate	9	20.5	6	13.6	1	2.3	14	31.8	1	2.3	14	31.8
High	0	0.0	6	13.6	0	0.0	6	13.6	0	0.0	6	13.6
Chi square test	X2= 25.850 P=.000*				X2= 8.877 P=.012*				X2= 19.524 P=.000*			
Employment												
Employed	9	20.5	11	25.0	2	4.5	18	40.9	3	6.8	17	38.6
Non employed	23	52.3	1	2.3	9	20.5	15	34.1	14	31.8	10	22.7
Chi square test	X2= 14.212 P=.000*				X2= 4.400 P=.036*				X2= 8.640 P=.003*			
If employed (n=20)												
Need physical effort	7	35.0	3	15.0	2	10	8	40.0	3	15	7	35.0
Not need	2	10.0	8	40.0	0	0.0	10	50.0	0	0.0	10	50.0
Chi square test	X2= 5.051 P=.025*				X2= 2.222 P=.136				X2= 3.529 P=.060			
Income												
Sufficient	13	29.5	11	25.0	3	6.8	21	47.7	6	13.6	18	40.9
Insufficient	19	43.2	1	2.3	8	18.2	12	27.3	11	25.0	9	20.5
Chi square test	X2= 9.170 P=.002*				X2= 4.400 P=.036*				X2= 4.141 P=.042*			

Table 3. Relation between medical health status data and studied patient's quality of life.

|	Pre				One month Post				Two months post follow up			
	Inadequate		Adequate		Inadequate		Adequate		Inadequate		Adequate	
	N	%	N	%	N	%	N	%	N	%	N	%
Disease duration												
1 – 5	2	4.5	8	18.2	0	0.0	10	22.7	1	2.3	9	20.5
6 -10	17	38.6	4	9.1	2	4.5	19	43.2	4	9.1	17	38.6
11 – 15	9	20.5	0	0.0	6	13.6	3	6.8	8	18.2	1	2.3
16 or more	4	9.1	0	0.0	3	6.8	1	2.3	4	9.1	0	0.0
Chi square test	X2= 19.608 P=.000*				X2= 19.683 P=.000*				X2= 22.797 P=.000*			
Detection of disease												
By symptoms	29	65.9	5	11.4	11	25.0	23	52.3	16	36.4	18	40.9
By chance	3	6.8	7	15.9	0	0.0	10	22.7	1	2.3	9	20.5
Chi square test	X2= 11.911 P=.001*				X2= 4.314 P=.038*				X2= 4.476 P=.034*			
Previous hospitalization												
No	11	25.0	7	15.9	2	4.5	16	36.4	4	9.1	14	31.8
1 - 2 times	11	25.0	5	11.4	2	4.5	14	31.8	5	11.4	11	25.0
>2 times	10	22.7	0	0.0	7	15.9	3	6.8	8	18.2	2	4.5
Chi square test	X2= 5.102 P=.078				X2= 13.985 P=.001*				X2= 9.630 P=.008*			
Duration of hospitalization												
< one week	3	11.5	0	0.0	1	3.8	2	7.7	1	3.8	2	7.7
One week	7	26.9	0	0.0	4	15.4	3	11.5	6	23.1	1	3.8
> one week	11	42.3	5	19.2	4	15.4	12	46.2	6	23.1	10	38.5
Chi square test	X2= 3.869 P=.144				X2= 2.225 P=.329				X2= 4.905 P=.086			
Presence of co-morbidities												
No	14	31.8	7	15.9	2	4.5	19	43.2	4	9.1	17	38.6
Yes	18	40.9	5	11.4	9	20.5	14	31.8	13	29.5	10	22.7
Chi square test	X2=.744 P=.388				X2= 5.132 P=.023*				X2= 6.502 P=.011*			
What are these co-morbidities (n=23)												
DM	3	13.0	0	0.0	2	8.7	1	4.3	2	8.7	1	4.3
Chi square test	X2=.958 P=.328				X2= 1.098 P=.295				X2=.144 P=.704			
Hypertension	16	69.6	5	21.7	8	34.8	13	56.5	12	52.2	9	39.1
Chi square test	X2=.608 P=.435				X2=.109 P=.742				X2=.038 P=.846			
Cardiac	3	13.0	0	0.0	3	13.0	0	0.0	3	13.0	0	0.0
Chi square test	X2=.958 P=.328				X2= 5.367 P=.021*				X2= 2.654 P=.103			
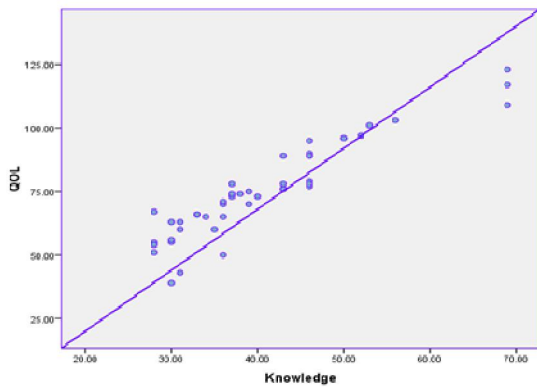
Figure (3): Correlation between knowledge score and quality of life score pre implementation of the self-care protocol
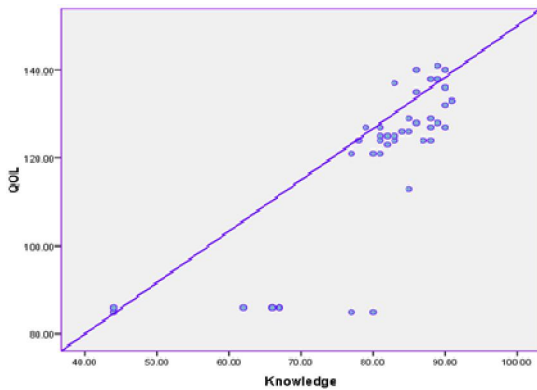

Figure (4): Correlation between knowledge score and quality of life score post implementation of the self-care protocol
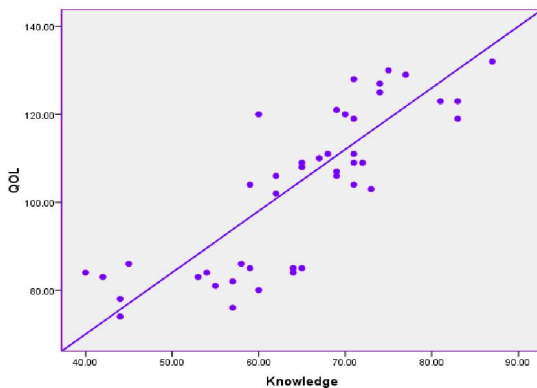

Figure (5): Correlation between knowledge score and quality of life score 2 months following implementation of the self-care protocol

6- Discussion:

Cirrhosis and its related complications remain a prominent global health concern despite advances in understanding and treating the disorder. Early diagnosis and intervention strategies may reduce the impact of cirrhosis; however, patient's lack of knowledge about self-care practices would impact negatively on their health related quality of life [12]. Therefore; this study was aimed to assess patients' quality of life and knowledge about liver cirrhosis, design and apply self-care protocol about liver cirrhosis, and evaluate the impact of this designed self-care protocol on patients' knowledge and quality of life.

Concerning demographic characteristic of the studied patients, the current study showed that almost two thirds of studied patients were in fifties with mean age (53.1 ±5.2) years. It is in the same line with other studies done in Egypt by **Ahmed et al. (2018)** [13] who reported that most of participants were in fifties with a mean age (53.4 ±9.3) and **Abdel Rehaim & Mohamed (2017)** [14] reported that the mean age was (52.4 ±12.7) years. In contrast, **Al-Johani et al. (2016)** [15] reported that About 41.5% of participants aged from 20-35 years, 33.8% were 36-50 years old and 24.7% were older than 50. This may be due to aging increase the risk for chronic illness.

Regarding gender, the study result revealed that more than half of the studied patients were female. This result is in accordance with **Khalil et al. (2015)** [16] who reported that the majority of the studied patients were females. Also, **Chen et al. (2017)** [17] stated that more than half of participants were females. This result is inconsistent with, **Ali E. (2013)** [18] who reported that the majority of participants were males. From my point of view this difference may be due to variation in sample size of participants.

In relation to marital status, the study result showed that more than two thirds of the studied patients were married. This finding is agree with **Ahmed et al. (2018)** [13] and **Dong et al. (2018)** [19] who reported that majority of the studied subjects were married. This may be due to the same age group of the studied sample.

Concerning educational level, the present study illustrated that more than half of studied patients were illiterate. It is consistent with **Taha et al. (2015)** [20] who reported that the majority of studied patients were illiterate. In contrast, **Al Ghamdi & Shah (2018)** [21] reported that about half of patients had completed a formal college.

As regard to employment, the result of the present study showed that more than half of the studied patients weren't employed. This result is in accordance with **Dong et al. (2018)** [19] who reported that about three quarters of participants weren't employed. In contrast, **Souza et al. (2015)** [22] clarified that the majority of the studied patients were employed.

Concerning income, the present study showed that more than half of patients had sufficient income. It is in the same line with **Mahmoud et al. (2013)** [23] who reported that monthly income of the majority of the study subjects were enough for their daily requirements. In contrast, **Risk Sh. (2015)** [24] clarified that more than four fifths of the study and control group had insufficient income.

Regarding medical health status data of the studied patients, the result of the present study showed that about half of patients had the disease from (6-10) years with a mean duration (9.00 ±4.4) years. This finding is supported by **Khan et al. (2016)** [25] who reported that the mean duration of the disease was (10.15 ±3.5) years. In contrast, **Saleh et al. (2014)** [26] clarified that the mean duration of the disease was (3.5 ± 2.8) years.

The result of the present study also showed that more than three quarters of patients detected their disease by the presence of symptoms. It is agree with **Mohammed E. (2014)** [27] who mentioned that about two thirds of studied subjects detected their disease by the presence of symptoms. This may be due to onset of the disease usually a symptomatic.

Regarding previous hospitalization, the present study revealed that more than half of patients were previously hospitalized. These results agree with **Risk Sh. (2015)** [24] who clarified that more than two fifths of the study and control group were previously hospitalized. This may be due to chronic disease, which needs to seek medical care and sometimes require hospitalization.

Concerning duration of hospitalization, the present study showed that more than half of previously hospitalized patients stayed on hospital for more than one week. It is consistent with **El-Gamal et al. (2013)** [28] who reported that more than half of studied patients stayed in the hospital from 11 to 20 days.

In relation to presence of co-morbidities, the present study revealed that more than half of patients have co-morbidities and the majority of them have hypertension. It is agreed with **Mohamed & Mostafa (2018)** [29] who reported that nearly one fourth of study sample have diabetes mellitus, while nearly more than two thirds of the sample have diabetes and hypertension. This may be due to, cirrhosis can occur as a result of many factors and diseases.

Concerning the total patient's knowledge score about liver cirrhosis, the present study revealed that more than two thirds of patients had "poor" level of knowledge about liver cirrhosis before implementing the self-care protocol. This may be due to lower educational level of the studied patients (more than half of the studied patients were illiterate). This level of knowledge was improved to be "good" in almost four fifths of patients immediately post

implementation and more than two fifths of them 2 months following implementation. These results agree with a study done by **Mansouri et al. (2017)** [30] who showed that there was statistically significant improvement in total knowledge scores of the intervention group immediately and one month after training self-management skills. Additionally, **Shah & Abu-Amar (2013)** [31] reported that educational interventions showed significant improvements to patients' knowledge about their disease.

Regarding total patient's quality of life score, it was obvious that more than two thirds of patients had "inadequate" quality of life score before implementing the self-care protocol, which improved to be "adequate" in three quarters of patients one month post implementing the self-care protocol and more than half of them two months following implementation of the self-care protocol. This could be attributed to the impact of the self-care protocol about liver cirrhosis. This results come in accordance with a study conducted by **Elsaadani et al. (2018)** [32] 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. Moreover, **Ibrahim & Madian (2011)** [33] compared between the experimental and the control groups regarding Health Related Quality of Life (HRQL) before & after the intervention program, they reported that there was a significant increase in all items of HRQL after intervention.

Concerning relation between demographic characteristics and patient's quality of life. It was obvious that patients in age group from (51-60) years old obtained inadequate QOL score than in age group from (40-50) years old. This agree with **Ray et al. (2010)** [34] who said that Patients with age <55 years tended to have a higher CLDQ score as compared to those ≥55 years. Furthermore, the study result shows that married patients obtained adequate QOL score than divorced and widow patients. It is consistent with **Hsu et al. (2012)** [35] who revealed that being married was associated with better health related quality of life.

The present study revealed that illiterate patients obtained inadequate QOL score than patients with high and intermediate educational level. This agrees with **El-Gilany & Alam (2015)** [36] who reported that illiterate patients have significantly lower mean scores of CLDQ and its domains. This may be due to education may help people cope with their problems. Moreover, this study revealed that patients with sufficient income obtained adequate QOL score than patients with insufficient income. It is in the same line with **Abd El-Rahman S. (2013)** [37] who reported that patients with sufficient income, reported a higher

means ± SD values of QOL than patients with insufficient income.

Regarding relation between medical health status data and studied patient's quality of life. This study results show that patients whose duration of illness ranged from (1-10) years obtained adequate QOL score than whose duration of illness ranged from (11-16) years or more. It is consistent with **Mahalli & Alharthi (2017)** [38] who said that patients with longer duration of illness obtained low QOL scores than patients with shorter duration. Moreover, this study revealed that patients who didn't have co-morbidities had adequate QOL score than who had co-morbidities. It is in the same line with **Metwally et al. (2013)** [39] who reported that patients who had other co-morbidities obtained lower QOL score than who hadn't other co-morbidities.

Concerning, correlation between study variables, the present study revealed that there was a statistically significant positive correlation between knowledge score and quality of life score pre, post, and two months following implementation of the self-care protocol about liver cirrhosis. It is in the same line with **Ibrahim A. (2011)** [40] who reported that both knowledge and quality of life were significantly and positively correlated at pre, post, and two months following program implementation. These findings may be attributed to the fact that the individuals who have high knowledge are able to understand the necessity of lifestyle changes and more motivated to perform healthy behaviors.

Finally, these previous findings highlight the importance of the self-care protocol about liver cirrhosis on quality of life of patients with liver cirrhosis as its implementation proved to be effective in improving quality of life of those patients. The research hypothesis approved and came true.

7- Conclusion:
Based on the results of the present study, it can be concluded that:
▪ There was a marked decline in the quality of life of patients with liver cirrhosis before implementing the self-care protocol.
▪ Patient's knowledge regarding liver cirrhosis, symptoms & ways to overcome it, and complications & ways of prevention were unsatisfactory.
▪ Designing and implementing the self-care protocol for patients with liver cirrhosis showed an improvement in patient's knowledge about self-care that reflect improvement of patient's quality of life.

8- Recommendation:
Based upon findings of the present study, the following suggestions are recommended:

▪ Distribution of the developed self-care protocol to liver cirrhotic patients in hepatology units through the responsible personal to increase their knowledge about ways to overcome symptoms and complications of the disease and thus improve their quality of life.
▪ Providing liver cirrhotic patients in hepatology units with continuous education about self-care to overcome symptoms and complications of the disease and thus improve their quality of life.
▪ Increase awareness of general population about causes of liver cirrhosis such as, hepatitis B & C viruses, and encourage people to take a more active role in preventing exposure to these viruses and/or modifying their behavior that permit transmission.
▪ Continuous education and follow up in chronic hepatitis B & C patients to decrease its complications.
▪ Replication of the study on a large sample and in different hospital settings for generalization of results.

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