Effect of Nursing Management Protocol on Selected Side Effects of Interferon and Ribavirin among Hepatitis C Patients

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Abstract: Interferon related side effects need extensive researches especially the management strategies of these side effects are available. This study was carried out to assess the effect of nursing management protocol on selected side effects of Interferon and Ribavirin among hepatitis C patients. A convenience sample of 60 hepatitis C patients of both sexes in liver out patient clinic at Shebin El- Kom teaching hospital was selected for data collection. Tools for data collection included Tool 1: Structured interview questionnaire. It includes 3 parts to assess medical data and knowledge of patients. Tool 2 : Fatigue severity scale to measure fatigue severity among studied sample. Tool 3: Anxiety scale to assess the anxiety level of studied sample. All studied sample had several complains related to Interferon before giving the nursing management. Also there were statistical significance differences in all laboratory findings and body temperature before and after the study by 8 weeks. There were statistical significant improvement of the knowledge after4 and 8 weeks from beginning of the study. Also, there was significant improvement in anxiety and fatigue level after 8 weeks from beginning of the study. It is concluded that: nursing intervention and knowledge about chronic hepatitis C, its treatment and management of Interferon related side effects seemed to have positive effects on improving patients knowledge about diseases and managing side effects of treatment and self care modalities that reflected by improvement in laboratory findings, vital signs, patients complains, anxiety level and fatigue level. It is recommended that: Promotion & enhancement of the self care modalities to the patient; a strict written instruction with pictures about disease process, prohibited and allowed foods, rest and physical activities and follow up should be continued after termination of the treatment through a rehabilitation program.
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1. Introduction:

Hepatitis C virus (HCV) primarily attack the liver and the chronic hepatitis C infection is now recognized as an important and global health care problem that afflict about 170 million individual world wide [(1)]. Epidemiological data suggested that those with the highest prevalence of HCV are 20-39 years of age. Among those individuals and in the twenty- five years following initial infection, twenty to twenty five percent develop cirrhosis and three to five percent develop fatal complications such as hepatocellular carcinoma which results in an estimated death rate of 8000 to 10000 annually from hepatitis associated chronic liver diseases [(2)].

Liver hepatitis C continues to be a public health problem in Egypt. Its incidence may be increasing and its prevalence is the highest reported worldwide. The overall prevalence of anti HCV was 18.9 % [(3)]. While Allen [(4)] reported that an estimated 15 to 20 percent of the population has been exposed to hepatitis C compared to less than 5 percent in neighboring Sudan and 2 percent in the United States. In some areas of Egypt the rates are even higher. The infection rate among Egyptians 10 to 50 years old was 19.4 percent in southern Egypt, 26.5 percent in central Egypt and 28.4 percent in northern Egypt. Also in Egypt, patient admission in the National Liver Institute Hospital has been increasing at a very high rate over the past years. In 2002, more than 90,000 patients received treatment in outpatient's clinics and inpatients services that double the number for 1999 [(5)]. But Marwan *et al.* [(6)] reported that 10% of Egyptian population has hepatitis B and C viruses.

All patients with long term hepatitis C are potential candidates for antiviral therapy. During the last decade, Interferon alfa (INF-a) monotherapy was established as antiviral treatment of choice for treatment of naive patients with chronic hepatitis C for fighting viruses in the body, regulating the reproduction of cells and regulating the immune system [(7)]. Several small amounts of Interferon is a naturally produced by cells of the immune system of the body. But there have been considerable advances in the treatment of this disease in recent years. Nowadays the most effective and generally available

treatment for HCV is a combination therapy that includes alfa Interferon (INF-a) and Ribavirin [8].

One of the major concerns with this therapy is its adverse effects. The amount of Interferon that occurs naturally in the body is very small, when it is injected, the amount in the body increases greatly. This is the cause of side effects, even though it is a naturally occurring substance. Some of these side effects may happen in the first or second hours and be over with quickly. Others can last several hours or more. Most of them will get better or disappear over times as therapy continues and body gets used to the therapy [9]. The most expected and common side effects with Interferon alfa and Ribavirin can be categorized to five group which are constitutional symptoms (flu-like symptoms) such as fever, myalegia, headache, chills and fatigue that varies from mild to sever, occurs in up to half of all patients and may start two to three hours after the drug is given ,injection site reaction, hematological side effects including anemia, thrombocytopenia and neutropenia that make patients more vulnerable to infection, bleeding or bruising, neuropsychiatric side effects and thyroid disorders [10]. Moreover Bianchi *et al.* [11] reported that among the most prominent neuropsychiatric side effects are symptoms of depression and cognitive impairment. These side effects negatively impact the patient quality of life.

Lankarani [12] stated that improving compliance with therapy can be enhanced by some measures such as patient education, close follow up, adequate treatment of side effects and minimizing dose changes. While lack of expertise in the proper management of these side effects as well as lack of educating patient may lead to higher rates of drug discontinuation or dose reduction with resultant lower efficacy of treatment.

Nurses are in a key position to carry out health education since they are the health care providers who have continuous contact with patients and their families and have the best opportunities to assess potential problems or side effects, discuss medical regimen and give teaching about all aspects of care which includes maintaining physical activity, recognizing activity limitations, conserving energy, following dietary modifications and adhering to medication schedule with attending to side effects [13].

People find it helpful to have their Interferon before going to bed at night, so that; the side effects are less noticeable. Simple measures to prevent or treat these side effects are adequate hydration by drinking plenty of liquids (two to three quarts of fluids per 24 hours), light to moderate regular exercises, alternating schedule of injection days with lighter work loads, giving injection in different places, conserve energy by getting plenty of rest and maintain nutrition [14]. Actinominophene and Ibuprofen before the time of injection may prevent these symptoms as fever, headache and/or generalized ache. If patient experience these side effects, he/she should discuss them with health care team who can prescribe medications and/ or offer other suggestions that are effective in managing such problems. Also the patients usually lack energy reserves and must learn how to conserve it to decrease the demands on liver. The patients should identifies activities that cause fatigue and bed rest is recommended until the patient regain strength in which activity level is increased gradually as the patient condition improves [14].

Diet is the most important interventions that should be maintained to ensure that the diet will meet the required caloric needs by providing oral care before meals, serving portions of foods and fluids within dietary restrictions of Sodium, offering small frequent meals by offering four to six per day which can prevent gastric distension that increase fatigue, being in high fowler position during meals, arranging medication schedule so that it doesn't interfere with meals and discouraging smoking and intake of caffeine beverage as tea and cola that can increase cardiac load and decrease O2 availability that can increase fatigue [15].

Reducing anxiety is a difficult task. Occasionally, the patients need interventions to deal with anxiety rather than to control it. Techniques such as guided imagery, deep breathing and relaxation technique may help [16]. Also National Hepatitis C Program [17] mentioned that making arrangement for maximal job flexibility and limitation of stress at work can be extremely helpful and encourage patients to share their felling with friends and family.

Aim of the Study

The aim of this study was to assess the effect of nursing management protocol on selected side effects on Interferon and Ribavirin among hepatitis C patients.

Research question:

What is the effect of nursing management protocol on selected side effects on Interferon and Ribavirin among hepatitis C patients?

2. Material and Methods

Design:

A quasi experimental design was utilized.

Setting:

The study was carried out in liver out patient clinic at Shebin El-Kom teaching hospital.

Subjects:

A convenience sample of 60 hepatitis C patients of both sexes that was available during the time of data collection, in the previously mentioned setting was selected according to the following criteria:

- Had been receiving at least one treatment dose
- During the first three months of treatment.
- Experiencing selected side effects as fever, headache, fatigue, anxiety and anorexia.

Exclusion criteria:

- Presence of these side effects due to other medical causes before starting nursing management protocol.

Tools:

Three tools were used and utilized by the researchers

Tool 1: Structured interviewing questionnaire: developed by the researchers to assess patient's medical data and knowledge. It consisted of:-

Part one: Sociodemographic data such as age, sex, marital status, education and occupation.

Part two: Medical data as laboratory investigations (Hemoglobin level, White blood cell count, Platelets, Alanine aminotransferse and Asperate aminotransferse), vital signs and patients complain after drug was taken.

Part three: Assessment of patient knowledge about:

- Disease process (definition, causes, signs and symptoms and treatment).
- Drug used (name, action, dose, route of administration and frequency).
- Side effects of the drug taken.
- Measures used to manage these side effects.

Tool 2. Fatigue severity scale:

It was adopted from Krupp [18]. It used to measure fatigue severity. It consisted of nine statement, and the researchers read each statement carefully and circle a number from 1-5 that best describes patient degree of agreement with each statement, however 1 indicates strongly disagree (low fatigue level) and 5 indicates strongly agree (high fatigue level). The total score ranges from 9-45 however, the score from 13.5 to 22.5 means mild fatigue, score from 23 to 31.5 means moderate fatigue and score more than 31.5 means severe fatigue. The Arabic version of scale was used.

Tool 3.Anxiety scale:

This scale was developed by Taylor [19] then translated by the researchers to assess the anxiety level. It was composed of 50 statements to which the answer was either (yes) or (no). Every answer by yes was given a score 1 and no was given zero. Sum of yes was given the total anxiety score. A score of 0-16 were denoting being free from anxiety. A score of 17-20 were denoting mild anxiety. As score from 21-26 was presenting moderate anxiety and score from 27-29 was indicating severe anxiety. Finally, score above 30 was indicating panic.

Method

1-Official permission: Before the study began and after explanation of the purposes of the study, a written approval was obtained from the director of out patient clinics to carry out the study.

2-Tools development: The study tool one was developed by the researchers after extensive review of the relevant literature. This tool was tested for content validity by five experts in the field of nursing and liver specialists. Modifications were done accordingly then the tool was designed in its final format and tested for reliability using a test- retest method and a Pearson correlation coefficient formula was used. It was found to be 0.987.

3-Consent: Consent was obtained from patients to participate in the study. The researchers initially introduced themselves to all potential subjects and they were assured that the collected data were absolutely confidential.

4-Pilot study: A pilot study was conducted on 3 patients to test feasibility, clarity and applicability of the tools then necessary modifications were done accordingly.

5-Data collection: Data were collected from October 2008 to the end of April 2009. The researchers initiated data collection by firstly collecting sociodemographic and medical data. Then each participant' knowledge was assessed for disease process, drug used, side effects and measures used to control these side effects. Fatigue and anxiety were assessed for each participant by using tool 2 and 3.

6-Health education:

-After collection of pre study data. The data obtained were meant to aid in formulating nursing management that tailored to suit patient's side effects.

-Each patient was scheduled for a minimum of 3 teaching sessions in three consecutive visits to out patient clinics. Each session lasted forty five minutes for each patient. Patients received verbal instructions supplemented by written materials as an illustrative guide for more clarifications.

- Each patient was given health instructions about disease process as: definition, causes signs and symptoms and treatment; drug used for treating HCV as: name, dose, route of administration and frequency; side effects of Interferon alfa and

Ribavirin and methods to control these side effects. These educations were done individually.

-Patients were asked to repeat the knowledge and skills learned several times until the researchers made sure that it was successfully mastered.

-The other two sessions were done to reinforce the provided knowledge and respond to patients questions.

7-Follow up: Each patient was assessed and monitored three times(pre nursing management protocol, after four weeks and after eight weeks) using all tools to assess the effect of nursing education on these side effects.

Statistical analysis:

Data was collected, tabulated and statistically analyzed using SPSS version 2 statistical program. Comparison between patient's qualitative data before and after the study by 4 and 8 weeks was done using Mc Nemar test at 5% level of significance.

3. Results

Table (1) revealed that more than three fourth of studied sample (76.7%) were male. As regard marital status, the majority (90%) of the studied sample were married. In relation to educational level, about half (46.7%) had basic education. While 70% were workers. The mean age of studied sample was 41.06± 9.31years. More than half (53.3%) discovered the diagnosis from one year or more.

Table (2) showed that there were significance differences of Hemoglobin, leukocyte count and Alanine aminotransferse enzyme level before the study and after 8 weeks. While there were highly significance differences of platelet count and asparate aminotransferse enzymes before the study and after 8 weeks.

Table (3) showed that before the study had begun, 60% of studied sample had fever, tachycardia and tachypnea. While after 8 weeks from the beginning of the study, 66.7% of them had normal temperature and 60% had normal pulse and respiration. Regarding blood pressure, it was noticed that 16.7% of the studied sample had hypotension before the study. While after 8 weeks, hypotensive patients were represented by 36.7% of studied sample. Moreover all of studied sample (100%) had several complains after drug administration. But 53.3% had the same results after 8 weeks. There were highly significance difference of patients complain before the study and after 4 and 8 weeks.

Table (4) showed that there were statistical significance differences between knowledge of studied sample before the study and after 8 weeks regarding definition of viral hepatitis, action and side effects of medication, management of anorexia and fatigue. While there was a highly statistical significance difference between patient's knowledge before and after 8 weeks related to signs and symptoms of hepatitis C virus, treatment and its dose and route, management of fever and headache.

Table (5) demonstrated that there was an improvement in anxiety level of studied sample after beginning of study than before beginning of the study (70% were panic before the study while after 8 weeks only 13.3% were panic). There was a statistical significance difference between anxiety level before and after the study by 8 weeks.

Figure (1) illustrate that there was continuous improvement of fatigue level along the study period in which 93.4% of studied sample had sever fatigue before the study but after 4 weeks 43.4% had sever fatigue. While after 8 weeks only 20% had sever fatigue. There was a highly statistical significance difference between before and after the study by 4 and 8 weeks regarding fatigue level.

Table (I): Sociodemographic characteristics of studied sample.

Sociodemographic characteristics	Study group (n=60)	
	No.	%
Sex		
• Male	46	76.7
• Female	14	23.3
Marital status		
• Married	54	90
• Single	6	10
Educational level		
• Illiterate	6	10.00
• Basic	28	46.7
• Secondary	4	6.7
• University	22	36.6
Occupation		
• Worker	42	70
• House wife	2	3.3
• Professional work	16	26.7
Discovery of diagnosis		
• <1 year	28	46.7
• ≥1year	32	53.3
Age (years) X ± SD	41.06± 9.31	

Table (2): Some laboratory investigations (Hb, WBCs, Platelets, ALT and AST) of studied sample before and after study had begun (X ± SD)

laboratory investigations	Before the study (n=60) X ± SD	After 4 weeks (n=60) X ± SD	After 8 weeks (n=60) X ± SD	Mc Nemar test	
				P1	P2
Hemoglobin (gm/dl)	9.1±0.2	9.2±0.2	9.9±0.2	0.8	0.05*
White blood count (cu mm)	6535±273	6660±396	8090±637	0.5	0.08*
Platelets (cu mm)	113.9±3	130.7±8.9	170.7±4.9	0.04*	0.00**
Asparate aminotransferse(u/l)	85.2±3.5	73.5±2.3	73.3±8	0.00**	0.000**
Alanine aminotransferse(u/l)	99.2±5.1	91.9±4.2	88.8±6.6	0.04*	0.05*

P1=test of significance between before the study and after 4 weeks.
P2= test of significance between before the study and after 8 weeks.

Table (3): Distributions of studied sample according to their vital signs and patient complain before and after study had begun

Vital signs and patient complain	Before the study (n=60)		After 4 weeks (n=60)		After 8 weeks (n=60)		Mc Nemar test		
	No	%	No	%	No	%	P1	P2	P3
Temperature(C)									
• Normal	24	40	24	40	40	66.7	>0.05	>0.05	<0.01**
• Fever	36	60	36	60	20	33.3			
Pulse									
• Normal	24	40	24	40	36	60	>0.05	>0.05	>0.05
• Tachycardia	36	60	36	60	24	40			
Respiratory rate									
• Normal	24	40	28	46.7	36	60	>0.05	>0.05	>0.05
• Tachypnea	36	60	32	53.3	24	40			
Blood pressure									
• Normal	50	83.3	50	83.3	38	63.3	>0.05	>0.05	>0.05
• Hypotension	10	16.7	10	16.7	22	36.7			
Complains									
• Yes	60	100	60	100	32	53.3	---	<0.001**	>0.001**
• No	0	0	0	0	28	46.7			

P1=test of significance between before the study and after 4 weeks.
P2= test of significance between before the study and after 8 weeks.
P3= test of significance between after 4 weeks and 8 weeks

Table (4): Distributions of studied sample regarding their knowledge about hepatitis C virus before and after study had begun

Knowledge about hepatitis C virus	Before the study (n=60)		After 4 weeks (n=60)		After 8 weeks (n=60)		Mc Nemar test		
	No	%	No	%	No	%	P1	P2	P3
Definition of viral hepatitis									
• Correct	4	6.7	20	33.3	20	33.3	<0.05*	<0.05*	>0.05
• Incorrect	56	93.3	40	66.7	40	66.7			
Causes									
• Correct	18	30	18	30	24	40	>0.05	>0.05	>0.05
• Incorrect	42	70	42	70	36	60			
Symptoms &Signs									
• Correct	0	0	4	6.7	24	40	>0.05	<0.001**	<0.01**
• Incorrect	60	100	56	93.3	36	60			
Treatment									
• Correct	16	26.7	58	96.7	58	96.7	<0. 001**	<0.001**	>0.05
• Incorrect	44	73.3	2	3.3	2	3.3			
Action									
• Correct	0	0	10	16.7	12	20	>0.05	<0.05*	>0.05
• Incorrect	60	100	50	83.3	48	80			
Dose									
• Correct	12	20	38	63.3	46	76.7	<0.01*	<0.0001**	>0.05
• Incorrect	48	80	22	36.7	14	23.3			
Route									
• Correct	16	26.7	46	76.7	44	73.3	<0.001**	<0.001**	>0.05
• Incorrect	44	73.3	14	23.3	16	26.7			
Frequency									
• Correct	26	43.3	22	36.7	28	46.7	>0.05	>0.05	>0.05
• Incorrect	34	56.7	38	63.3	32	53.3			
Side effects									
• Correct	0	0	2	3.3	18	30	>0.05	<0.01*	<0.01*
• Incorrect	60	100	58	96.7	42	70			
Management of fever									
• Correct	0	0	42	70	36	60	<0.0001**	<0.0001**	>0.05*
• Incorrect	60	100	18	30	24	40			
Overcoming anxiety									
• Correct	10	16.7	26	43.3	44	73.3	<0.05*	<0.0001**	<0.01*
• In complete	50	83.3	34	56.7	16	26.7			

Continue table (4): Distributions of studied sample regarding their knowledge about hepatitis C virus before and after study had begun

Knowledge about hepatitis C virus	Before the study (n=60)		After 4 weeks (n=60)		After 8 weeks (n=60)		Mc Nemar test		
	No	%	No	%	No	%	P1	P2	P3
Management of anorexia									
• Correct	16	26.7	26	43.3	40	66.7	>0.05	<0.01*	<0.01*
• Incorrect	44	3.3	34	56.7	20	33.3			
Management of fatigue									
• Correct	26	43.3	32	53.3	46	76.7	>0.05	<0.01*	<0.01*
• Incorrect	34	56.7	28	46.7	14	23.3			
Controlling Headache									
• Correct	16	26.7	28	46.7	42	70	>0.05	<0.001**	<0.001**
• Incorrect	44	73.3	32	53.3	18	30			

P1=test of significance between before the study and after 4 weeks.
P2= test of significance between before the study and after 8 weeks.
P3= test of significance between after 4 weeks and 8 weeks

Table (5) Distribution of studied sample regarding their anxiety level before and after study had begun

Anxiety level	Before the study (n=60)		After 4 weeks (n=60)		After 8 weeks (n=60)		Mc Nemar test	
	No	%	No	%	No	%	P1	P2
• **Free from anxiety**	0.0	0.0	4.0	6.7	10.0	16.7	0.01**	0.06*
• **Mild anxiety**	2.0	3.3	14.0	23.3	24.0	40.0		
• **Moderate anxiety**	0.0	0.0	6.0	10.0	6.0	10.0		
• **Sever anxiety**	16.0	26.7	14.0	23.3	12.0	20.0		
• **Panic**	42.0	70.0	22.0	36.7	8.0	13.3		

P1=test of significance between before the study and after 4 weeks.
P2= test of significance between before the study and after 8 weeks.

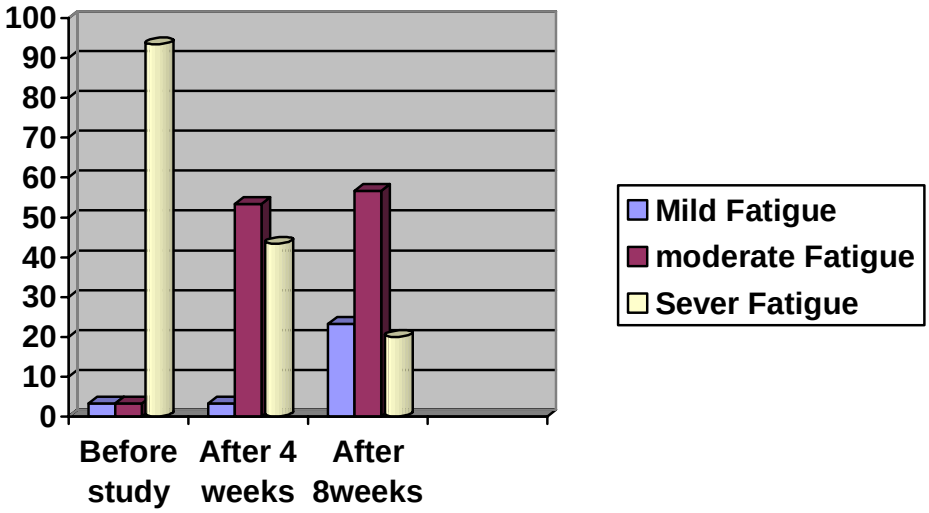

Figure (1) Distribution of studied sample regarding their Fatigue level before and after study had begun

4. Discussion

Because of the world wide prevalence of hepatitis C virus and the associated cirrhosis and mortality, treatment is an important issue which may be carried out by combination therapy of Interferon and Ribavirin. But the adverse effects with this combination therapy are not rare. These effects could be managed effectively which has a great impact on patient compliance during the course of treatment [12] .The current study represented that the mean age of the sample was 41.06± 9.31 years. This finding was lower than the results of Heneedy[20] who reported that the mean age of her study sample was 49.8±8.3 for study group and 49.3±8.7 years for control group. This may be explained by the lower sample size of the current study which could not be generalized.

As regard to sex, the studied sample showed that, the majority of them were male. This was in line with Alavian *et al.* [21] who reported that more than three fourth of studied sample were male.

Laboratory investigations:

National Hepatitis C Program [17] mentioned that Interferon can suppress bone marrow production of Red blood cells, White blood cells and platelets that leads to anemia, neutropenia and thrombocytopenia. This was in agreement with the findings of the current study in which the mean Hemoglobin level, Platelet count was decreased than normal level before giving the proposed nursing intervention. But the mean white blood cell level was the lowest normal level (6553±273 cu mm). Also Lankarani [12] mentioned that anemia and thrombocytopenia were the most significant hematological side effects of combination therapy in which there is usually a drop of approximately 2-3 g/dl of Hemoglobin level and 10-50% of platelet count. Moreover findings of the present study showed significant improvement of Hemoglobin level, White blood count and Platelet count after application of the proposed nursing intervention. This was in agreement with Heneedy [20] who stated that nursing intervention for patients with liver diseases has a number of positive effects on physical responses including laboratory findings. The results of the current study revealed that the mean Asparate Aminotransferse and Alanine Aminotransferse were increased before applying the nursing intervention with a significant improvement after applying the nursing intervention. This was supported by Alavian [21] who showed that mean Asperate and Alanine Aminotransferse were decreased after patient education and this alteration was significant.

Vital signs and patients complain:

Manns *et al.* [7] mentioned that most common adverse events reported for Interferon during the clinical studies were flu like symptoms especially fever that varies from mild to sever and occur in more than half of all patients. This was consistent with the findings of the present study which revealed that more than half of all subject had fever.

In addition, the results of the present study showed that less than one fifth of the studied sample had hypotension before giving the proposed nursing intervention protocol. This was in accordance with the study of National Hepatitis C Program [17] which denoted that there are less common side effects of Interferon as hypotension that occurs in 10-29% of

patients receiving this therapy. Also it was observed from the current study that there were continuous improvement of vital signs after giving nursing intervention to patients and this improvement was significant for temperature. This result was supported by Heneedy [20] who found that there was an improvement of respiration, pulse and blood pressure among her study after giving nursing intervention.

Alter *et al.,* [22] stated that adverse reactions can occur with any drug even over- the counter medications. The most frequent side effects of Interferon are fever, headache, fatigue, nervousness, loss of appetite, loss of thinning hair and injection site erythema and simple measures such as adequate hydration, light to moderate exercises and alternating schedule of injection to days with lighter workload are very effective. This was in line with the finding of the current study which observed that all of studied sample complained of fever, headache, anxiety, anorexia and fatigue before giving the proposed intervention. While after the study by 8 weeks, there was significantly reduction of number of patients who had these side effects.

Patient's knowledge:

Canobbio *et al.* [23] emphasized that those patients with liver diseases need education, counseling and support to enable them to adjust to their chronic illness and its treatment [33]. Results of the current study showed that there was significant improvement of sample knowledge in approximately every aspects of knowledge given to them than pre intervention. This may be attributed to the theoretical sessions that were provided to cover all aspects of hepatitis C virus (definition, causes, signs and symptoms, treatment, action, dose, route, frequency, side effects and how to deal with it) which eventually increase patients knowledge. These results were consistent with Fareed [24] who showed a statistical significant difference between before and after conduction the nursing management protocol that indicates an improvement of patients total mean score of knowledge after intervention. This result was also in line with Elshikh [25] who found that a significant differences between control and study groups as regard to total knowledge scores after protocol of care. In the present study, patients pre intervention denoted that almost three fourth of them lack any essential knowledge about their medication, action, dose, route, frequency, possible side effects and how to manage it. The educational sessions had given a significant increase in their knowledge about Interferon. This finding was consistent with that obtained by Elshiekh, [25] who found that repetition teaching on patient medication have significantly increase their knowledge regarding dose, special precautions and possible side effects of drug.

Anxiety level:

Anxiety can be defined as an accompanying emotion of stressful encounters. As the disease state is considered stressors, the Interferon adds another stressor to patients [26]. Lankarani [12] stated that Interferon based regimen can induce a variety of neuropsychiatric adverse events including depression, anxiety and panic attack. Also National Hepatitis C program [17] mentioned that sever anxiety is a very common side effects in clinical trial in 30% or more of patients and if patients are aware that medications predispose them to anxiety and learn how to deal with it, they can control anxiety more effectively. These were in consistent with the results of the present study in which before nursing intervention about three fourth of the sample were panic and the rest had sever anxiety but after 8 weeks less than half of the sample had mild anxiety and about one fifth was free from anxiety. While the result was in contrast with result of Hunt *et al.* [27] who reported that their sample exhibited fewer emotional problems as well as lower incidence of anxiety during Interferon therapy. This discrepancy may be attributed to in-completing the questionnaire by all their participants (only about three fourth) so we can not generalize their results.

Fatigue level:

The finding of this study revealed that about all of studied sample had sever fatigue before giving the intervention. But after 8 weeks more than one fourth of the sample had mild fatigue and more than half had moderate level of fatigue and these results were in accordance with Heneedy [20] who found that fatigue was decreased among the study group subjects than control group after giving the nursing intervention.

5. Conclusion:

The present study revealed that enrichment of patients with nursing intervention and knowledge about chronic hepatitis C, its treatment and management of Interferon related side effects seemed to have positive effects on improving patients knowledge about diseases and managing side effects of treatment and self care modalities that reflected by improvement in laboratory findings, vital signs, patients complains, anxiety and fatigue level.

Recommendations:

a). Promotion and enhancement of the self care modalities to the patient; a strict written instruction with pictures about disease process, allowed foods,

rest and physical activities and follow up should be continued after termination of the treatment through a rehabilitation program.

b). Special attention should be given regarding teaching patients family members who have an active role in patient care to help them comply with the prescribed medical and nursing intervention.

c). Replication of the study using a large probability sample from different geographical areas to allow greater generalizability of the results.

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