

Impact of Hepatitis C on Health-Related Quality of Life in Egypt Enas Mohamed Ibrahim and Abeer Abd El Aziz Madian

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Abstract: Background: Hepatitis C Virus (HCV) has a major impact on quality of life and can cause patients significant distress. From a public health perspective, it is of great concern that there is no vaccine to prevent HCV infection and no post exposure prophylaxis. Therefore, prevention can only be based on increase awareness of HCV infection and change harmful behaviors aiming to reduce the risk of transmission of HCV infection to the others. So, education remains the way to change negative perceptions and attitudes towards HCV as infectious disease. **Aim of study:** Is to evaluate the impact of an educational program on Health-Related Quality of Life (HRQOL) among Virus Hepatitis C patients. **Material and Methods:** Two approaches were used: A cross-sectional design in the first phase to assess both generic and disease-specific quality of life among Hepatitis C patients, and True-experimental design in the second phase to evaluate the impact of an intervention program on QOL of a sub-sample. **Results:** As regard to Hepatitis C patients' generic HRQOL, the program created a positive effect on Physical Component Summary (PCS) ($p= 0.000$) and Mental Component Summary (MCS) ($p= 0.000$) and all its' items as general health, bodily pain, physical functioning, role limitation physical, social functioning, role limitation emotional, vitality and mental health. As regard to Hepatitis C patients' specific HRQOL, the program developed a positive effect ($p= 0.000$) on its' all items: physical, psychological, social and spiritual impacts. **Conclusion and Recommendations:** These findings presented a clear picture of the magnitude of the problem of the impact of HCV on HRQOL among Hepatitis C patients. Also, the positive effect of health education program on HRQOL of HCV patients. Therefore, Ministry of Health (MOH) activities, Hospitals and specialized centers activities and educational campaigns to increase awareness of population at risk and general population recommended. These activities should have the priority to encourage people to take a more active role in preventing exposure to HCV and/or modifying their behavior that permit transmission of HCV to reduce the burden of HCV disease on HRQOL of infected patients in Egypt.

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1. Introduction

Hepatitis C is often referred to as the “silent epidemic”. The World Health Organization (WHO) reports that approximately 3% of the world population, or approximately 170 million persons, are infected with the Hepatitis C Virus (HCV) with between 3 and 4 millions new infections each year.⁽¹⁾ Africa and Asia have the highest reported prevalence rates, in contrast to the low rates of HCV in North America, Western Europe, and Australia.⁽²⁾

Egypt has the highest prevalence of Hepatitis C in the world. Overall, estimates of the HCV rate in the general population have range between 10 and 20 percent.⁽³⁾ Geographically, the Hepatitis C prevalence has been shown to be higher in Lower Egypt (Nile Delta) than in Upper Egypt and lower in urban compared to rural areas.⁽⁴⁾ And HCV infection has become the leading risk factor for hepatocellular carcinoma (HCC) in Egypt (antibodies present in as many as 75–90% of HCC cases).⁽⁵⁾ According to 2008 Egypt Demographic and Health Survey (EDHS),⁽⁶⁾ use of contaminated needles/syringes during mass schistosomiasis treatment campaigns during the 1960s-1980s has been identified as a key mode of transmission for HCV infection. Suggesting the continuing role for parenteral exposure, **Mohamed**⁽⁴⁾

found that medical interventions including surgery, blood transfusion, dental treatment, and use of shared needles to be associated with increased risks of HCV infection among Egyptian workers. Sexual contact and perinatal exposure are associated with HCV infection but HCV transmission by these routes is relatively inefficient.⁽⁶⁻⁸⁾

Quality Of Life (QOL) is a popular term that conveys an overall sense of well-being, including aspects of happiness and satisfaction with life as a whole. It is broad and subjective rather than specific and objective.⁽⁹⁾

Unlike other viral forms of hepatitis, the acute phase is rare.⁽¹⁰⁾ The chronic form, presenting scarce and nonspecific symptoms, makes clinical diagnosis of the disease difficult. The infection lasts for decades for a person to develop serious complications^(6,8) and the patient may or may not be aware of its presence.⁽¹¹⁾ Additionally, there is no vaccine to prevent HCV infection, and immune-globulin is not effective for post exposure prophylaxis.^(12,13) Furthermore, HCV-infected people serve as a reservoir for transmission of infection to others if left untreated.⁽⁵⁾

The treatment for Chronic Hepatitis C (CHC) is combination therapy with pegylated interferon and ribavirin associated with many unpleasant side effects

which are psychological in nature.⁽¹⁴⁾ People with CHC on combination therapy will go through phases of depression, anger, frustration and despair as a result of the symptoms of CHC and side-effects of therapy.⁽¹⁵⁾ For these reasons many patients refuse to start treatment, probably due to concerns about adverse effects.⁽¹⁶⁾ Moreover, as a result of the number of patients who do not respond to current treatment and the number of cases detected very late, HCV-related disease is the main indication for referral for liver transplant, which is expected to increase over the next 20 years.⁽¹⁷⁾ So, a growing number of people can be expected to live with chronic HCV for many years of their lives. This long survival with HCV leads to diminish Health-Related Quality Of Life (HRQOL) even in the absence of clinically significant liver disease; in particular the impact of HCV seems to be most dramatic in social and physical function, general health and vitality, such as the effects of Hepatitis C on families, work environments, and on society as a whole.⁽¹⁸⁾

Lack of knowledge and awareness about Hepatitis C in the community often leads to misinformation, missing of opportunities for prevention and treatment, and stigmatization of infected populations. The consequences for members of at-risk communities are important in that missing opportunities for prevention can lead to infection of additional people with HCV. Once infected, they frequently are unaware of their infection and so run the risk of unknowingly infecting others and of not receiving appropriate medical management.^(19,20)

Despite Egypt's status as the country with the highest levels of HCV infection in the world, most studies have been done on diagnosis, management, and treatment of Hepatitis C Virus (HCV)⁽²⁰⁾; and few studies have been done to measure the Health Related Quality Of Life (HRQOL), address the educational campaigns about increase awareness of , preventing exposure to HCV or modifying people's behavior may help reduce the burden of disease in Egypt.⁽³⁾ For these reasons, the aim of this study was to evaluate impact of an educational program on Health-Related Quality of Life among Virus Hepatitis C patients attending Center of liver and treatment of hepatic viruses by interferon in national medical institute in Damanhour governorate.

The hypothesizes of this **descriptive, correlational** study was:

1. There is positive impact of an educational program on Health-Related Quality of Life among Virus Hepatitis C patients.
2. There is negative impact of an educational program on Health-Related Quality of Life among Virus Hepatitis C patients.

2. Material and Methods

Study design:

Two approaches were used for conducting this study.

- A cross-sectional study was conducted in the first phase to assess the quality of life (QOL) among Hepatitis C patients.
- True-experimental design was used in the second phase to evaluate the impact of an intervention program on QOL of a sub-sample.

Study setting:

Center of liver and treatment of hepatic viruses by interferon in national medical institute in Damanhour governorate.

Subjects:

Chronic Hepatitis C patients with interferon therapy attending the Center of liver and treatment of hepatic viruses by interferon in national medical institute in Damanhour governorate.

Sample size:

The sample size was calculated a summing the following assumption: Prevalence of good HRQOL of 50% (to give the maximum sample size), confidence limit 95% and degree of absolute precision 0.05. This gave a minimum sample size of 384; this number was rounded to 400 to compensate for any incomplete questionnaire.

Sampling design:

The study involved two sampling methods:

Sample for preliminary assessment

Center of liver and treatment of hepatic viruses by interferon in national medical institute in Damanhour governorate was visited daily. Four outpatient clinics (afternoon shift 12 - 4 pm) were visited by four data collectors. The first 400 positive Hepatitis C patients who accepted to participate in the study after being oriented about the purpose of it were selected.

Sub sample for intervention program

The intervention phase: a sub-sample of 200 Hepatitis C patients were chosen randomly from the previous sample. These 200 patients were randomized into experimental (100 patients) and control (100 patients) groups. Both groups were be subjected to post-test.

Technical design: - The study is dividing into 3 phases:

Pre-intervention phase:

All Hepatitis C patients of the study sample were subjected to a pre- coded interview questionnaire. The questionnaire was answered within 30 minutes and completed in the same visit. This questionnaire is divided into five sections to collect the following data:

Section 1: Socio-demographic characteristics

This section includes gender, age, residence, marital status, occupation, and occupation loss due to HCV, education, family income, family size and

number of rooms. The maximum score was ranged from 3-36 points and the social class was categorized as “low: 3-14”, “middle: 15-25”, “high: 26-36”.

Section 2: Knowledge of HCV

This section of the questionnaire consists of 31 items includes general knowledge about HCV, mode of transmission, factors makes further damage of liver, protection from HAV and HBV and healthy diet. The maximum score was ranged from 0-62 points and the total knowledge score was categorized as “Poor: < 60th percentile”, “Average: 60th – 80th percentile”, “Good: ≥ 80th percentile”.

Section 3: Practices related to HCV

This section of the questionnaire consists of 13 items assessing patient’s behavior. It is divided into two parts: risky behaviors and protection of other from having HCV. The maximum score was ranged from 0-26 points and the total behavior score was categorized as “Poor: < 60th percentile”, “Average: 60th – 80th percentile”, “Good: ≥ 80th percentile”.

Section 4: Generic Health-Related Quality Of Life assessment

A modified Short-Form health survey (SF-36v2®) was used specifically to measure eight health domains: physical functioning, role participation with physical health problems (role-physical), bodily pain, general health, vitality, social functioning, role participation with emotional health problems (role-emotional) and mental health. ^(21,22)

A modification applied to the SF-36v2® such as reduction of the number of items (29 instead of 36), simplify the Arabic version tool language to be better understandable for the local respondent’s culture, finally simplifying and changing the original scale to 3 point scale for all questions. All items were scored from 1-3, total generic HRQOL score was obtained by summing the scores of the eight domains. All raw scores were transformed to a 0-100 score using the following formula⁽²³⁾:

$$\text{Transformed score} = \frac{(\text{actual raw score} - \text{lowest possible raw score}) \times 100}{\text{Possible raw score range}}$$

Higher score indicates better Generic Health-Related Quality Of Life (HRQOL).

Section 5: Disease-Specific Health-Related Quality Of Life Assessment

The hepatitis quality of life questionnaire ⁽²⁴⁾ used to capture all the possible impact of the HCV on the physical, psychological, social and spiritual aspects of the respondent during the course of a disease.

The HCV specific Health-Related Quality Of Life represents of 35 items. This questions is dividing into 4 domains Physical (16 items), Psychological (7 items), Social (8 items) and Spiritual impact of the disease (4 items). All items were scored from 1-3, scores of each of the four domains was calculated by summing the scores of its items. Total specific HRQOL score was obtained by summing the scores of

its domains. All raw scores were transformed to a 0-100 score using the following formula⁽²³⁾:

$$\text{Transformed score} = \frac{(\text{actual raw score} - \text{lowest possible raw score}) \times 100}{\text{Possible raw score range}}$$

Higher score indicates better Generic Health-Related Quality Of Life (HRQOL).

Intervention phase:

Selection of the place:

The educational sessions were held at the outpatient clinics in the center or in the conference room at the faculty of nursing in Damanhour University.

Selection of participants

All patients who got average or poor level of knowledge at the pretest were identified (n=395). Then, the researcher selected 200 of them randomly by using the blind paper picking and these 200 patients were divided randomly by using the blind paper picking into experimental group (100 patients) and control group (100 patients). Some family member or relative had attended the educational sessions with their patients.

The 100 Hepatitis C patients in the intervention (experimental group) were contacted by telephone to attend the intervention program. They were divided into smaller groups; each group (10-15 Hepatitis C patients) attended 4 sessions (1 sessions /week) and the total number of sessions for the whole experimental group was 32 over a period of 1 month. The duration of each session was ranged between 40-60 minutes, started with 5 minutes warming up, then 20 minutes lecture and followed by group discussion for 15-35 minutes questions and answers. (The data collection process from March 2011 till October 2011)

Methods used: Lecture and Group discussion.

Audio-visual materials used: Data show (available visual aids)

Post-intervention phase:

The same *interview* questionnaire of HRQOL introduced for both experimental and control groups three months after the end of the intervention program to evaluate the impact of the program on Health-Related Quality Of Life (HRQOL) for hepatitis C patients.

Ethically, the control group was exposed to educational sessions and provided with available visual aid after the completion of post test.

Statistical analysis:

The collected data was processed and analyzed using SPSS program, version 16. Data were revised, coded, analyzed and tabulated using the number and percentage distribution. Pearson Chi-Square test was applied to gauge the difference between categorical data. Paired t-test and ANOVA were used to compare between sample means for quantitative data with normal distribution. Mann-Whitney test and Wilcoxon

signed ranks test were used to compare the non-normal quantitative data. Statistical significance level was set at 5% ($p \leq 0.05$ was considered statistically significant).

3. Results

Part I: Description of the study sample

Socio-demographic characteristics

Table (1) shows the distribution of the Hepatitis C patients according to socio-demographic characteristics. *Socio-demographic data* were collected in the present study to gain a clear picture of the 400 HCV patients' characteristics. Nearly two thirds of the sample were male with mean age was 43.5 (range 18-68) years. Regarding education, 37.5% had high school level (secondary school and middle institute), while 30.1% were illiterate, read & write or got primary school education. 57.7% were lived in urban areas, 84.8% were married, 60.2% of patients were employed and the majority of them (79.4%) lost their work as result of having HCV. Concerning income, nearly three quarter (71.5%) of the study sample earned less than 150 L.E per month with mean 616 (range 50-5000) L.E per month. More than half (56.0%) of study sample had crowding index between 1-2 person per room. On the other hand, those with high crowding index (more than four persons per room) constituted (2.0%) and nearly half (47.8%) of the sample had middle socioeconomic level.

Knowledge of HCV

Table (2) shows the distribution of the study sample according to their knowledge' sub scores and total score. It was revealed that almost half of the sample (49.4%) got good level of general knowledge about HCV. More than half of the sample (55.3%) got average level of knowledge about mode of transmission, and (41.0%) of them had average level of knowledge about factors that cause further damage of liver, while the majority of the sample got poor level of knowledge about protection from HAV and HBV and about what is the healthy diet for persons infected with HCV (91.7%, 97%) respectively.

Practices related to HCV

Table (3) shows the distribution of the study sample according to their behavior' sub scores and total score. The majority (78.7%) of the sample achieved good level score of life style behavior, followed by about half of the sample (49.8%) and (49.4%) got poor and average level of behavior regarding protection of others respectively.

Health Related Quality Of Life (Generic and Specific).

Figure (1) shows the distribution of the study sample's mean SF-36 generic Health-Related Quality Of Life domains and their components summary measure. Generally, it is clear that patients saw themselves as sick. It was observed from the figure that

Physical Component Summary (PCS) and Mental Component Summary (MCS) are nearly having the same mean. Among eight domain of SF-36 generic quality of life measure, Role Emotional (RE) ranked first with the highest mean of patients 50.9 ± 30.9 , followed by Social Function (SF) 49.8 ± 33.2 and Physical Functioning (PF) 48.3 ± 30.9 , while Vitality (VT) ranked last 36.8 ± 24.7 .

Figure (2) show the distribution of the study sample's mean disease specific health-related quality of life domains. Among CHC patients, spiritual impact was observed the highest mean of specific quality of life 71.8 ± 23.9 , followed by physical impact 65.5 ± 17.4 , psychological impact 57.7 ± 26.3 and the social impact was observed the lowest one 51.7 ± 23.9 .

Part II: Results of intervention

Table (4) shows the comparison between experimental & control groups regarding their socio-demographic characteristics.

The table illustrates that, there was no significant difference between the experimental and the control group regarding their socio-demographic characteristic in terms of: sex ($p = 0.454$), age ($p = 0.393$), residence ($p = 0.322$), education ($p = 0.052$), marital status ($p = 0.087$), work status ($p = 0.053$), income/capita ($p = 0.153$), crowding index ($p = 0.162$) and socioeconomic score level ($p = 0.825$). They are almost matching.

Table (5) portrays the comparison between experimental & control groups regarding their Health Related Quality Of Life (HRQOL) (generic and specific) before and after the intervention program. Generally, the table illustrates that the results of experimental group of hepatitis c patients revealed that there is significant increase in all items of Health Related Quality Of Life (HRQOL) (generic and specific) after intervention than before. Regarding *generic health related quality of life (SF-36)*, the results revealed that there is significant increasing in Physical Component Summary (PCS) ($p = 0.000$) and Mental Component Summary (MCS) ($p = 0.000$) and their items in terms of: general health, bodily pain, physical functioning, role limitation physical, social functioning, role limitation emotional, vitality and mental health.

Concerning *specific health related quality of life*, the results revealed that there is significant increasing in its items in terms of: physical impact, psychological impact, social impact and spiritual impact with $p = 0.000$.

Regarding control group, the table illustrates that there is no significant difference between after and before the intervention except in bodily pain ($p = 0.02$), Physical Component Summary (PCS) ($p = 0.011$). While, concerning specific health related quality of life, there is significant increasing in social impact ($p = 0.000$) and spiritual impact ($p = 0.000$).

Table (6) shows the comparison between experimental & control groups regarding mean percentage change as a result of intervention program in relation to Health Related Quality Of Life (HRQOL) (generic SF-36 and specific).

Regarding *Generic Health Related Quality Of Life (HRQOL) (SF-36)*, the results revealed that there is significant difference between experimental and control groups in favor of experimental group regarding mean percentage change of Physical Component Summary (PCS) ($Z=-12.4$, $p\leq 0.01$). Concerning the domains of PCS, the results revealed that general health was the highest mean score, followed by bodily pain and role limitation physical while physical functioning ranked last. Concerning

Mental Component Summary (MCS), the results revealed that there is significant difference between

experimental and control groups in favor of experimental group regarding mean percentage change of MCS ($Z=-12.4$, $p\leq 0.01$). Regarding the domains of MCS, the results revealed that the vitality domain was the highest mean score, followed by role limitation emotional and mental health while social functioning ranked last.

Concerning the domains of *disease specific health related quality of life*, the results revealed that there is significant difference between experimental and control group in favor of experimental group regarding mean percentage change. As regard the domains of MCS, the results revealed that the social impact of hepatitis c virus was the highest mean score, followed by psychological impact and spiritual impact while physical impact of HCV ranked last.

Table (1) Distribution of the study sample according to socio-demographic characteristics

Socio-demographic characteristics (no=400)	No	%
Sex: Male	258	64.5
Female	142	35.5
Age/ year (no=400)		
18 -	40	10.0
28 -	63	15.8
38 -	133	33.3
48 -	145	36.3
58 - 68	19	4.6
Mean \pm SD	(43.5 \pm 10.3)	
Residence : Rural	169	42.3
Urban	231	57.7
Education: Illiterate	85	21.3
Read and write or primary school	35	8.8
Preparatory school	47	11.8
High school	150	37.5
University or higher	83	20.6
Marital Status : Single	36	9.0
Married	339	84.8
Widow& divorced & separated	25	6.2
Work Status (no=400)		
Working	241	60.2
Student	5	1.3
House wife	98	24.5
Retired	22	5.5
Unemployed	34	8.5
Working losses as a result of HCV (n=34)		
No	7	20.6
Yes	27	79.4
income/capita (no=400)		
< 50	80	20.0
50-	112	28.0
100-	94	23.5
150-	34	8.5
200-	31	7.7
> 250	49	12.3
Rang= 50-5000 Mean \pm SD (616.7 \pm 611.9)		
Crowding Index (no=400)		
> 4 / room	8	2.0
3-4 / room	21	5.3
2-3 / room	100	25.0
1-2 / room	224	56.0
< 1 / room	47	11.7
Rang= 1.0-12 Mean \pm SD (8.13 \pm 2.39)		
Socio economic score level (no=400)		
Low socio economic level	119	29.8
middle socio economic level	191	47.8
high socio economic level	90	22.4

Table (2) Distribution of the study sample according to their knowledge' sub scores and total score.

knowledge' sub scores and total score	No=400	%
General knowledge about HCV		
Poor	105	26.3
Average	97	24.3
Good	198	49.4
Range (0-8) 5.0± 2.4		
Mode of transmission		
Poor	88	22.0
Average	221	55.3
Good	91	22.7
Range (0-32) 24.5±4.9		
Factors makes further damage of liver:		
Poor	82	20.5
Average	164	41.0
Good	154	38.5
Range (0-6) 4.3±1.6		
Protection from hepatitis A&B		
Poor	367	91.7
Average	32	8.0
Good	1	0.3
Range (0-4) 0.4±0.6		
Healthy diet for persons infected with HCV		
Poor	388	97.0
Average	11	2.7
Good	1	0.3
Range (0-12) 2.7±2.3		
Total level of knowledge score:		
Poor	176	44.0
Average	219	54.8
Good	5	1.2
Range (0-62) 36.9±7.6		

Table (3) Distribution of the study sample according to their Behavior' sub scores and total score.

Behavior' sub scores and total score	No=400	%
Life style behavior		
Poor	17	4.3
Average	68	17.0
Good	315	78.7
Range (0-15) 2.7±0.5		
Protection of other		
Poor	199	49.8
Average	198	49.4
Good	3	0.8
Range (0-12) 1.5±0.5		
Total behavior scores		
Poor	101	25.3
Average	218	54.5
Good	81	20.2
Range (0-27) 1.9±0.7		

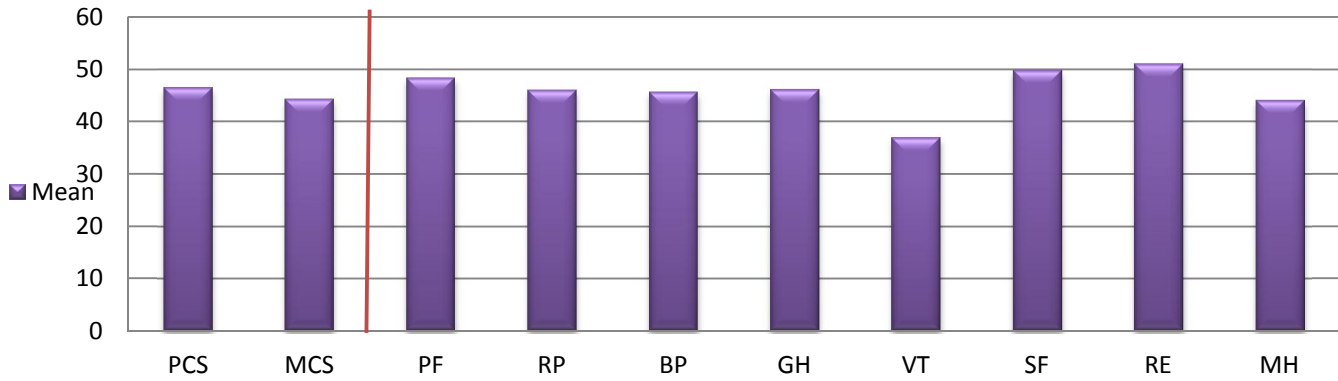


Figure 1: Distribution of the study sample's mean generic SF-36 domains and component summary measures

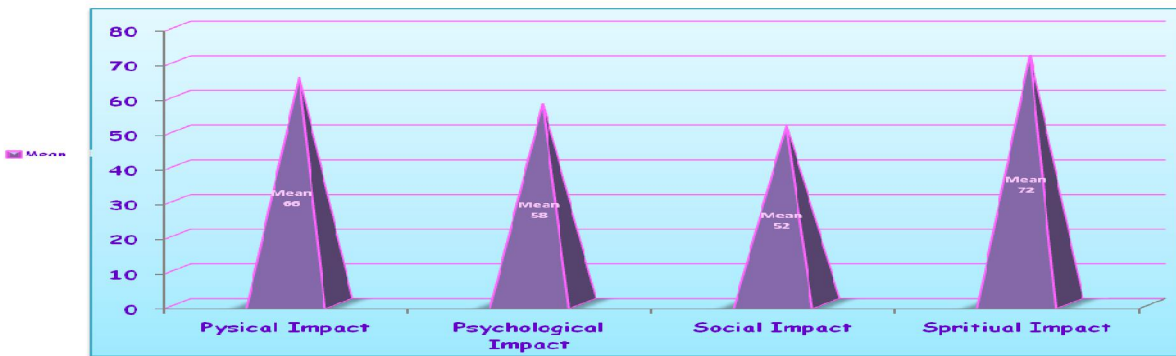


Figure 2: Distribution of the study sample's mean disease specific HRQOL domains

Table (4) Comparison between Experimental & Control groups regarding their socio-demographic characteristics before intervention

Socio-demographic characteristics	Experimental (No=100)	Control (No=100)	X ² @	P
	No (%)	No (%)		
Sex			0.561	0.454
Male (n=258)	69 (69.0)	64 (64.0)		
Female (n=142)	31 (31.0)	36 (36.0)		
Age			4.097	0.393
18<28	8 (8.0%)	17 (17.0%)		
28<38	19 (19.0%)	16 (16.0%)		
38<48	32 (32.0%)	28 (28.0%)		
48<58	34 (34.0%)	34 (34.0%)		
58<68	7 (7.0%)	5 (5.0%)		
Residence			0.982	0.322
Rural	44 (44.0%)	51 (51.0%)		
Urban	56 (56.0%)	49 (49.0%)		
Education			9.401	0.052
Illiterate	20 (20.0%)	23 (23.0%)		
Read & write	8 (8.0%)	5 (5.0%)		
Basic education	4 (4.0%)	15 (15.0%)		
High school	48 (48.0%)	35 (35.0%)		
University or higher	39 (39.0%)	29 (29.0%)		
Marital Status			4.876	0.087
Single	6 (6.0%)	15 (15.0%)		
Married	88 (88.0%)	77 (77.0%)		
Widow& divorced & separated	6 (6.0%)	8 (8.0%)		
Work Status			9.360	0.053
Working	66 (66.0%)	58 (58.0%)		
Student	0 (0%)	4 (4.0%)		
House wife	17 (17.0%)	27 (27.0%)		
Retired	10 (10.0%)	4 (4.0%)		
Unemployed	7 (7.0%)	7 (7.0%)		

Table (4) Cont.:

Socio-demographic characteristics	Experimental (No=100)	Control (No=100)	$X^{2@}$	P
	No (%)	No (%)		
income/capita <ul style="list-style-type: none"> • < 50 • 50- • 100- • 150- • 200- • > 250 	29 (29.0%)	16 (16.0%)	8.052	0.153
	23 (23.0%)	35 (35.0%)		
	24 (24.0%)	20 (20.0%)		
	7 (7.0%)	12 (12.0%)		
	6 (6.0%)	5 (5.0%)		
	11 (11.0%)	12 (12.0%)		
Crowding Index <ul style="list-style-type: none"> • 3 or more • 2-<3 • 1-<2 • < 1 	5 (5.0%)	12 (12.0%)	5.13	0.162
	24 (24.0%)	18 (18.0%)		
	62 (62.0%)	56 (56.0%)		
	9 (9.0%)	14 (14.0%)		
Socioeconomic score level <ul style="list-style-type: none"> • Low • Middle • High 	32 (32.0%)	28 (28.0%)	0.384	0.825
	46 (46.0%)	49 (49.0%)		
	22 (22.0%)	23 (23.0%)		

@ Pearson Chi-Square test was applied

4. Discussion

Most people who are diagnosed with HCV infection react with some degree of shock, fear and denial.⁽¹⁵⁾ The effects of hepatitis C on families, work environments, and on society as a whole, are impressive, of particular concern loss of productivity in the workforce, increased tension, stress in the family and potential decreases in quality of life.⁽¹⁸⁾

Concerning the patients' *knowledge* about HCV, the pre-test results revealed that the great majority of the sample gave dissatisfied level of knowledge about HCV; general knowledge about HCV (poor 26.3% and average 24.3%), mode of transmission (poor 22.0% and average 55.3%), which factor's makes further damage of liver (poor 20.5% and average 41.0%), how to protect themselves from getting HAV and HBV infection (poor 91.7% and average 8.0%) as well as their knowledge about the healthy diet needed by HCV patients (poor 97.0% and average 2.7%). This impairment of knowledge in the present study may be attributed to two reasons; first, lack of health educational mass campaigns about the HCV and the way of living healthy with it. Secondary, it is obvious that, lower educational level in the studied sample (nearly one third were either illiterate or had low level of education) may be associated with a weaker awareness of the seriousness of the disease and a worse ability of the infected patients to cope with the challenges of a chronic condition.

After the implementation of health educational program, the experimental group showed significant

improvement in their knowledge compared with the control group. This finding agreed with the study conducted in Ain Shams university⁽¹³⁾ that reported that the educational program increases the samples' awareness and the level of knowledge about HCV infection.

Regarding the patients' *behavior* about HCV, the pre-test results showed that nearly one fourth of the sample achieved dissatisfied level of behavior about their risky life style behaviors (poor 4.3% and average 17.0%). Moreover, the majority of the study sample got dissatisfied level of behavior regarding protection of others from acquiring HCV (poor 49.8% and average 49.4%). This might be because the infectious disease that compounded by stigmatization may imposed stressful effect that led them to continue or increase their risky behaviors. Also, the level of support that someone with CHC might receive was less when compared to someone with a chronic illness that does not carry a stigma which might affect self-esteem and cause alterations in the quality of life.⁽²⁵⁻²⁶⁾

After program implementation the experimental group of Hepatitis C patients had a significant improvement of all behavior items regarding the prevention and controlling cross infection of HCV disease. These findings agreed with the study that reported significant improvement of the practice of the studied sample of HCV family members regarding prevention and controlling cross infection of the disease after exposure to health education program.⁽¹³⁾

Generic HRQOL instrument (SF-36) asks for patients' views about their health. This information will help keep track of how the Hepatitis C patients feel and how well they are able to do their usual activities. In the present study, the pre-test results showed that the Hepatitis C patients saw themselves as sick people, where they showed deteriorating mean score of physical and mental component summary of SF-36 HRQOL generic scale. After the implementation of the health educational program, the experimental group showed significant improvement in physical and mental components summary and all health domains of the SF-36 measuring HRQOL compared with the control group. This result is supported by a study that reported a significant improvement of the eight domains of SF-36 of HRQOL measurement of the studied sample of CHC after conducted to health education program.^(15,27)

Disease-Specific HRQOL instrument ask for patients' views about how HCV infection has affected their life. In the present study, the pre-test results showed that the Hepatitis C patients suffered from a spiritual, physical, psychological and social impacts of their HRQOL. The mean scores of spiritual impact was observed the highest mean of specific tool for measuring their quality of life, followed by physical impact, psychological impact, while the social impact was observed as the lowest one. According to highest impact of spirituality on CHC patients might be because they experienced higher levels of discrimination felt isolated from family, friends, neighbors and groups.^(15,28) Moreover, they interpreted HCV infection as part of God's punishment or finally worrying about an uncertain future rather than concerning on present. All these reasons had an impact on Hepatitis C patients, as the previously independent patients may suddenly become emotionally, financially or physically dependent on family members.^(29,30) While for lowest impact of sociality on CHC patients might be due to about half of the studied sample have rural residence, and it is obvious that the characteristics of rural cultures in Egypt are depend on when person infected with certain diseases, the relationships had deepened and became stronger so that their family members became an important source of physical, emotional and financial support.^(31, 32) This positive interaction used to be occurred within rural family than urban as the urbanization stressors cannot permit the patient's family members to take this role.

After the implementation of the health education program, the experimental group showed significant improvement in all items of disease-specific scale to measure HRQOL compared with the control group. These findings coincided with the studies conducted on Iranian patients with chronic liver diseases at 2005, revealed that the intervention was effective on all aspects of QOL among the experimental group.⁽³³⁾

It was astonishing to notice that *control group* of CHC patients in the present study showed a significant improvement in certain areas. Concerning area of knowledge regarding HCV infection, it showed improvement of general knowledge about HCV, healthy diet for persons infected with HCV and total knowledge score level. Concerning generic HRQOL measure, it showed improvement of bodily pain and PCS scale. While concerning Hepatitis C specific tool to measure HRQOL, it showed improvement of social impact and spiritual impact in post test. This might be due to spread of information through personal communication between patients in waiting rooms of outpatient clinic.

Limitation of the study:

Some of the participants didn't attend all sessions, either voluntary or the intervention program was held at the time of outpatient clinic, or their treatment coverage by the center.

Some of participations didn't complete the session due to coming from far areas.

Some participants were not willing or participate in all the activities of the session as group discussion or sharing by their ideas in the sessions

The participants give wrong number which was difficult to contact with them.

Conclusions and Recommendations

The findings of this study give a clear picture of the magnitude of the problem of the impact of HCV on HRQOL among Hepatitis C patients. Also, illustrate the positive effect of health education program on both generic (*SF-36*) and disease-specific HRQOL instruments of HCV patients. Therefore, recommendation concerning Ministry of Health (MOH) activities, Hospitals and specialized centers activities and increase awareness of population at risk and general population. These activities should have the priority to encourage people to take a more active role in preventing exposure to HCV and/or modifying their behavior that permit transmission of HCV to reduce the burden of HCV disease on HRQOL of infected patients in Egypt.

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