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Chronic Hepatitis C and Health Related Quality of Life: An Epidemiological Study in Kafr ElSheikh Governorate

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Abstract: ***Background: Annually, 350 000 to 500 000 people die from hepatitis C-related complications. Egypt has the highest prevalence rate of HCV in the world, making it the most challenging health problem facing the country. Patients with chronic hepatitis C, even without major disease-related complications, perceive themselves to be unwell and have significant physiological effect on quality of life and as a result all the participants struggled to maintain a meaningful life. Objectives: Better understanding and improving health related quality of life (HRQOL) among Hepatitis C patients in Kafr Elsheikh governorate, To identify the epidemiologic characteristics and risk factors of Hepatitis C compared to non-hepatitis C individuals and To evaluate the effect of the educational program on knowledge, behaviors and values of health related quality of life (HRQOL) among Hepatitis C patients. Subjects and methods: a case control study was conducted at outpatient clinics of Kafr Elsheikh Liver Research Center. The sample selected randomly and included 250 hepatitis C patients, 250 non hepatitis C individuals which were subjected to a pre-coded interview questionnaire and Generic Health Survey scale (SF-36) then From hepatitis c patients, the researcher selected 200 of them randomly and these 200 patients divided randomly into experimental group (100 patients) who receive the intervention program and control group (100 patients) who did not receive the intervention. Results: The results of this study have revealed dissatisfied level of knowledge and behavior among hepatitis C patients who attended outpatient clinic of Kafr Elsheikh Liver Research Center. The study declared that mean of Physical Component Summary (PCS) and Mental Component Summary (MCS) and their items is more prevalent in control group compared with case group and this might reflect the negative role of hepatitis C virus on the quality of life of the patients. Recommendations: there is no vaccine to prevent HCV infection. 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 lee- way to change negative perceptions and attitudes towards HCV as infectious disease.***

Keywords: Chronic Hepatitis C – Health Related Quality OF Life

1. Introduction

Chronic hepatitis C virus (HCV) infection is found to affect 130-150 million people worldwide. Annually, 350 000 to 500 000 people die from hepatitis C-related complications ***(WHO, 2014)***. Egypt has the highest prevalence rate of HCV in the world, making it the most challenging health problem facing the country ***(Esmat, 2013).*** In Egypt, 4% of the population aged from 1 to 59 years, or around 3.5 million Egyptians, had an active hepatitis C infection ***(EHIS, 2015).*** The genotype distribution in Egypt is mainly genotype 4 which is responsible for more than 90% of the infections, with the remaining due to genotype 1. ***(Waked et al, 2014).*** Medical interventions including surgery, blood transfusion, dental treatment, and use of shared needles are found 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 ***(Ibrahim and Madian, 2011).***

Quality of life has been defined as a "descriptive term that refers to people's emotional, social and physical well-being and their ability to function in the ordinary tasks of living ***(Donald, 2010).*** The impact of hepatitis C on health related quality of life (HRQOL0 among HCV patients has recently been discussed ***(Hlla and Dore, 2010).*** Studies suggested that patients with chronic hepatitis C, even without major disease-related complications, perceive themselves to be unwell and have significant physiological effect on quality of life and as a result all the participants struggled to maintain a meaningful life ***(Forton et al., 2006).***

Up till now, the Egyptian literature showed shortage of knowledge about the impact of HCV infection on the different aspects of health related quality of life among HCV patients and no studies were found to test the impact of different educational programs on the improvement of health related quality of life among these patients. This study aimed to examine risk factors of chronic hepatitis C virus (HCV) as well as the effect of chronic hepatitis C virus on health related quality of life among HCV patients attending outpatient clinics of Kafr Elsheikh Liver Research Center compared to a control group apparently free from hepatitis C infection. Moreover, the effect of an educational program on improvement of (HRQOL) among these patients has also been evaluated.

Personnel and Methods

The present study deals with detection of risk factors of hepatitis C virus in Kafr Elsheikh governorate and impact of disease on quality of life.

Research Setting

The study was carried out at outpatient clinics of Kafr Elsheikh Liver Research Center.

Research design

Two approaches were used for conducting this study.

1) A case control design was conducted in the first phase to study
   a) Different risk factors present in the study group compared to the control group.

b) Knowledge and behaviors about Hepatitis C in the case group compared to the control.
c) Quality of life (QOL) among Hepatitis C patients and the control group.

2) Intervention design (pretest-posttest) was used in the second phase to study the impact of an intervention educational program on knowledge, behaviors and values of QOL of a sub-sample of patients.

Target population:
Chronic hepatitis c patients (cases) attending the outpatient clinics of KafrElsheikh Liver Research Center for treatment and follow up and their relatives who have criteria of inclusion in control group.

Study duration
The study was conducted from November 2016 to October 2018 and passed through the following phases:

Preparatory phase:
A preparatory period preceded the operation phase of the work, during which the following activities were completed:
1) Review of literature was conducted.
2) Preparing the study tools.
3) Obtaining necessary permissions.
4) Conduction of a pilot study.

Tools of the study
1) **An Interview Questionnaire:** The questionnaire was designed to be interviewer-administered and it was divided into five sections.
2) **Tools and methods used during the educating sessions:**

Several teaching methods were used in the teaching settings such as group discussion and data show which help patients to share information, give them confidence and motivate them to comply with the contents of the intervention.

The questionnaire items covered the following aspects:
- Section1:Socio demographic characteristics
- Section 2: risk factors of Hepatitis C Virus
- Section3: HCV Knowledge and Perception of seriousness
- Section 4: Behaviors of HCV's patients
- Section 5: Health-Related Quality Of Life (HRQOL) assessment. Generic Health Survey scale (SF-36), Arabic version, was used to define the studied subjects' overall health status according to the items present in Generic Health Survey scale (SF-36).

Sampling:

Sample size:
The sample size was determined using epi-infoVersion 7 based on the following prerequisites:
- Two- sided Confidence level = 95%
- Power = 90%
- Ratio of controls to cases: 1:1
- Percent of controls exposed: 20%
- Odds ratio: 2

This gave a minimum sample size of 464, this figure was rounded to 500 (250 case and 250 control).

Sampling design:
The study involved two sampling methods:
1) Sample for epidemiological assessment
2) Sub samples for intervention program

Sample for epidemiological assessment
Patients (cases) having the following characteristics were included in the study:
1) Have chronic HCV infection defined through positive tests for anti-HCV antibody and positive Polymerase Chain Reaction (PCR) reported in their medical files.
2) Age between 25-60 years.
3) At beginning of treatment.
4) Be fully oriented about the purpose of the study and agree to participate.

The first 250 positive hepatitis c patients who accepted to participate in the study after being oriented about the purpose of it were selected.

Normal individuals having the following characteristics were included in the control group:
1) Apparently healthy individuals (No HCV infection and treatment).
2) Age between 25-60 years.
3) Absence of chronic diseases (DM, HTN, Cancer).

The control group was chosen from relatives of patients attending KafrElsheikh Liver Research Center. The first 250 non hepatitis c patients (control) who have the previous criteria and accepted to participate in the study after being oriented about the purpose of it was selected.

2. Sub sample for intervention program
The intervention phase: a sub-sample of 200 hepatitis C patients was chosen randomly from the study group. These 200 patients were randomized into experimental (100 patient) and control (100 patient) group. Both groups were subjected to pre-test and post-test.

Ethical Considerations
The study was conducted after explaining the phases of the study and its objectives to the participants. Only those who voluntarily agreed were included. Verbal consents were obtained from all the participants in the study. Data confidentiality and security was considered and the collected data was only used for the research purpose.

Implementation phase
During this phase the following steps were done:

Pre-test Study
A pilot study took about one month (from beginning of March 2017 to the end of March 2017) upon a sample of 40 individual (20 cases and 20 controls) attending outpatient clinic of Kafr Elsheikh Liver Research Center.

The pilot study aimed to:
1) Estimate the time required to fill the questionnaire.
2) Ensure that hepatitis c and non-hepatitis c individual will understand and accept the items of the questionnaire
3) Determined the items duplicated by other meaning items.
4) New wording as well as omission or addition of questions.

5) Detect difficulties that may arise and how to deal with it.

Data collection
The collection of data passed through the following:

1. Case control phase:
Baseline data were collected over a period of about 4 months (from beginning of April2017 to the end of July 2017). This phase included the500 individuals planned to be enrolled in the study. All hepatitis c patients (cases) and non-hepatitis c patients (control) 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 was divided into five sections to collect the data.

2. Intervention phase:
General objectives of the intervention program:
- To describe the details of general knowledge about HCV, mode of transmission, factors makes further damage of liver, protection from HAV & HBV.
- To help the patients to accept living healthy with hepatitis c virus.
- To protect others from hepatitis c virus infection.

Selection of the place:
The educational sessions was held at the outpatient clinics of KafrElsheikh Liver Research Center and took about one month from beginning of August 2017 to the end of August 2017.

Selection of participants
From hepatitis c patients, the researcher selected 200 of them randomly and these 200 patients divided randomly into experimental group (100 patients) who receive the intervention program and control group (100 patients) who did not receive the intervention. The 100 hepatitis c patients in the intervention (experimental group) 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.
For compensation the drop out of attending cases, both experimental group (received the intervention program) and control group (did not receive the intervention program) were increased to 110 patients for each group.

3- Post-intervention phase:
The same interview questionnaire was introduced for both experimental and control groups two months after the end of the intervention program for the assessment of the impact of the program on the knowledge, behaviors and Health-Related Quality Of Life (HRQOL) for hepatitis C patients This phase lasts about two months (from beginning of November2017 to the end of December 2017).

Data management and analysis:
This phase took about nine months (from beginning of January 2018 to the end of September 2018).
- Data was revised for completeness and consistency, and accordingly 2 questionnaires were excluded for missing data. Pre-coded data were entered and analyzed by the researcher under guidance of supervisor with the aid of Statistical Package of Social Science Software program (SPSS), version 18.
- Statistical significance level was $p \leq 0.05$ as an indication of statistically significant difference.
- Descriptive statistics were calculated which included: Arithmetic mean, Standard Deviation.
- Odds ratio (95% CI) was calculated by using Binary logistic regression
- Pearson Chi-Square Test was applied to measure the difference between categorical data.
- Independent t-test was used to compare between sample means for quantitative data with normal distribution.
- Multiple liner regression was used to find the predictors of QOL domains scores and independent variables among case group.
  Writing and printing the thesis was completed during last three months of this phase.

Points of weakness of the study
Some patients disagree to participate in the study. Their number, however, was very few from those agreed to participate. Also refused patients were comparable with those participated in terms of their age, sex, residence and general and hepatic health status. In our study, the possibility of prevalent bias of the studied case is suspected. However, because the study has included as much as possible the patients who were newly diagnose. Accordingly, the effect of selection bias in this respect was greatly decreased

2. Results

Table 1: Distribution of hepatitis C cases and control group according to socio-demographic characteristics

Socio-demographic characteristics	Case		Control		Odds ratio (95% CI)	P value
	No.	%	No.	%		
Sex						
male	87	34.8	108	43.2	0.7 (0.48-1.07)	0.6
female	163	65.2	142	56.8	1.000(REF.)	
Age (years)						
25-	41	16.4	44	17.6	1.000(REF.)	--------
35-	34	13.6	70	28	0.521(0.289-0.941)	0.031
45-	104	41.6	59	23.6	1.892 (1.111-3.220)	0.019
55-	71	28.4	77	30.8	1.011(0.580-1.688)	0.990
					T test	P value
Mean ±SD	47.48±9.69		45.83±9.94		1.87	0.060
Residence						
Urban	42	16.8	61	24.4	1.000(REF.)	0.037
Rural	208	83.2	189	75.6	1.59 (1.03-2.48)	
Educational level						
Illiterate	164	65.6	48	19.2	7.175(4.504-11.431)	0.000
Basic school	21	8.4	25	10	0.567(0.290 - 1.109)	0.097
High school	15	6	72	28.8	2.286(1.193 - 4.380)	0.013
University	50	20	105	42	1.000(REF.)	---------
Marital status						

Married	189	75.6	186	74.4	1.06(0.71-1.59)	0.757
Not Married	61	24.4	64	25.6	1.000(REF.)	
employment						
employed	92	36.8	137	54.8	0.48(0.33-0.68)	0.000
unemployed	158	63.2	113	55.2	1.000(REF.)	
Socio economic score level						
High socio-economic level	72	28.8	175	70	1.000(REF.)	------
middle socio-economic level	145	58	70	28	5.035(3.38-7.48)	0.000
low socio-economic level	33	13.2	5	2	16.042(6.022-42.743)	0.000

Table (1) Illustrates that 65.2% of the hepatitis C cases were females compared with 56.8% of control group. The age of 45-54 years represents the highest percentage of HC cases (41.6%) compared to (23.6%) among the control. The mean age of the hepatitis C cases was 47.48 ±9.69 compared with 45.83 ±9.94 of the controls. The majority of hepatitis C cases 83.2% were rural residence compared to75.6% of control group. 65.6% of the hepatitis C cases were illiterate compared to19.2% of control group. 75.6% of the hepatitis C cases were married compared with 74.4% of control. 36.8% of the hepatitis C cases was employed compared with 54.8 % of control. 28.8% of the hepatitis C cases were high socioeconomic level compared with 70 % of control.

Table 2: Distribution of hepatitis C cases and control group according to risk factors of disease

Risk factors	case		Control		Odds ratio	P value
	No.	%	No.	%	(95% CI)	
History of transfusion of blood or blood component	67	26.8	35	14	2.24 (1. 42-3.54)	0
	183	73.2	215	86	1.000(REF.)	
unsterilized surgical equipment	107	42.8	56	22.4	2.59 (1.75-3.82)	0
	143	57.2	194	77.6	1.000(REF.)	
History of Tartar emetic injection	102	40.8	44	17.6	3.22 (2.13-4.87)	0
	148	59.2	206	82.4	1.000(REF.)	
History of Unsterilized dentate equipment	76	30.4	25	10	3. 93 (2.40-6.43)	0
	174	69.6	225	90	1.000(REF.)	
History of circumcision	49	19.6	8	3.2	7.37 (3.41-15.93)	0
	201	80.4	242	96.8	1.000(REF.)	

Table (2): clarifies that 26.8% of the hepatitis C cases had history of transfusion of blood or blood component compared with 14% of the controls. 42.8% of the hepatitis C cases had history of unsterilized surgical equipment compared with 22.4% of the controls. 40.8% of the hepatitis C cases had history of tartar emetic injection compared with 17.6% of the controls. So 30.4% of the hepatitis C cases had history of unsterilized dentate equipment compared with 10% of the controls. 19.6% of the hepatitis C cases had history of circumcision compared with 3.2% of the controls. Finally, history of transfusion of blood or blood component, unsterilized surgical equipment, tartar emetic injection, unsterilized dentate equipment and circumcision are a significant risk factor for HCV infection.

Table 3: Distribution of hepatitis C cases and controls according to their knowledge scores about hepatitis c virus

knowledge' sub scores and total score	Cases		Controls		χ^2	P value
	No	%	No	%		
General knowledge about HCV score						
Poor	165	66	87	32.8	49.47	0
Average	30	12	48	19.2		
Good	55	22	115	46		
Protection from hepatitis A&B score						
Poor	197	78.8	124	49.6	46.53	0
Average	42	16.8	96	38.4		
Good	11	4.4	30	12		
Mode of transmission score						
Poor	173	69.2	83	33.2	74.27	0
Average	41	16.4	52	20.8		
Good	36	14.4	115	46		
Factors makes further damage of liver score						
Poor	2	0.8	2	0.8	47.53	0.000
Average	188	75.2	113	45.2		
Good	60	24	135	54		

Table (3)illustrates that poor general knowledge about HCV is more among hepatitis C patients; 66% compared with 32.8% for controls while good knowledge about HCV is more prevalent among controls;46% compared with 22% for cases. This difference among the cases and controls are statistically significant .Also, this table illustrates that poor knowledge about protection from hepatitis A&B is more among hepatitis C patients; 78.8% compared with 49.6% for controls while good knowledge about protection from hepatitis A&B is more prevalent among controls; 12% compared with 4.4% for cases. This difference among the cases and controls are statistically significant. More over poor knowledge about mode of transmission is more among hepatitis C patients; 69.2% compared with 33.2% for controls while good knowledge about mode of transmission is more prevalent among controls; 46% compared with 14.4% for cases. This difference among the cases and controls are statistically significant. As regard the average knowledge about Factors makes further damage of liver it was found more among hepatitis C patients; 75.2% compared with 45.2% for controls while good knowledge about factors makes further damage of liver is more prevalent among controls; 54% compared with 24% for cases. This difference among the cases and controls are statistically significant.

Table 4: Distribution of hepatitis C cases and controls according to their knowledge scores about hepatitis c virus

knowledge' sub scores and total score	cases		controls		χ^2	P value
	No	%	No	%		
Healthy diet for persons infected with HCV score						
Poor	189	75.6	132	52.8	49.43	0
Average	40	16	33	13.2		
Good	21	8.4	85	34		
Total level of knowledge score						
Poor	188	75.2	79	31.6	96.58	0.016
Average	11	4.4	43	17.2		
Good	51	20.4	128	51.2		

Table (4) illustrates that poor knowledge about healthy diet for persons infected with HCV is more among hepatitis C patients; 75.6% compared with 52.8% for controls while good knowledge about healthy diet for persons infected with

HCV is more clear among controls; 34 % compared with 8.4% for cases. This difference among the cases and controls are statistically significant .Also this table, illustrates that poor total level of knowledge for HCV is more among hepatitis C patients; 75.2% compared with 31.6% for controls while good total level of knowledge for HCV is more clear among controls; 51.2 % compared with 20.4% for cases. This difference among the cases and controls are statistically significant.

Table 5: Distribution of hepatitis C cases and controls according to their behavior scores about hepatitis c virus

Behavior' subs cores and total score	cases		Controls		χ^2	P value
	No	%	No	%		
Life style behavior						
Poor	16	6.4	3	1.2	80.14	0
Average	106	42.4	27	10.8		
Good	128	51.2	220	88		
Protection of other						
Poor	96	38.4	62	24.8	11.9	0.003
Average	153	61.2	188	75.2		
Good	1	0.4	0	0		
Total behavior scores						
Poor	5	2	0	0	33.48	0
Average	136	54.4	79	31.6		
Good	109	43.6	171	68.4		

Table (5) illustrates that poor life style behavior for HCV is more among hepatitis C patients; 6.4% poor life style behavior for HCV for persons infected with HCV compared with 1.2% for controls while good life style behavior for HCV is more prevalent among controls; 88 % good life style behavior for HCV for controls compared with 51.2% for cases. This difference among the cases and controls are statistically significant .The table illustrates that poor protection of other for HCV is more among hepatitis C patients; 38.4% poor protection of other for HCV for persons infected with HCV compared with 24.8% for controls while average protection of other for HCV is more prevalent among controls; 75.2 % average protection of other for HCV for controls compared with 61.2% for cases. This difference among the cases and controls are statistically significant. Also this table, illustrates that average total behavior score for HCV is more among hepatitis C patients; 54.4% average total behavior score for HCV for persons infected with HCV compared with 31.6% for controls while good total behavior score for HCV is more prevalent among controls; 68.4 % good total behavior score for HCV for controls compared with 43.6% for cases. This difference among the cases and controls are statistically significant.

Table 6: Comparison between hepatitis C cases and controls regarding their Health Related Quality Of Life (HRQOL)

HRQOL domains	Cases	controls	T test	P value
	Mean (SD)	Mean (SD)		
General Health	40(28)	84(19.5)	20.31	0
Bodily Pain	45.2(35.3)	90.6 (16.5)	18.36	0
Physical Functioning	57.2(33.3)	90.6(19.6)	13.64	0
Role Limitation Physical	30(47)	88.8(31.6)	16.52	0
PCS	45.51(32.44)	88.45(20.21)	17.76	0
Social functioning	42.9(39.1)	90.2(15.6)	17.69	0
Role Limitation Emotional	25.6(43.7)	69.2(46.2)	10.82	0.004
Vitality	38.5(28.8)	85.6(20.7)	21.01	0
Mental health	30.1(24.8)	75.4(33.1)	17.27	0
MCS	34.4(26.4)	81.1(24.7)	20.43	0

Table (6) illustrates that mean of Physical Component Summary (PCS) and Mental Component Summary (MCS) and their item is more prevalent in control group compared with case group. This difference among the cases and controls are statistically significant.

Table 7: Comparison between Experimental & Control groups regarding their Knowledge about HCV epidemiology (General knowledge, Protection from hepatitis A&B, Mode of transmission and Factors makes further damage of liver) after the intervention program

knowledge' sub scores and total score	Experimental		controls		χ^2	P value
	No	%	No	%		
General knowledge about HCV score						
Poor	1	1	53	53	85.04	0
Average	11	11	20	20		
Good	88	88	27	27		
Protection from hepatitis A&B score						
Poor	4	4	71	71	97.15	0
Average	63	63	23	23		
Good	33	33	6	6		
Mode of transmission score						
Poor	1	1	62	62	88.22	0
Average	45	45	23	23		
Good	54	54	15	15		
Factors makes further damage of liver score						
Poor	0	0	0	0	75.69	0
Average	13	13	74	74		
Good	87	87	26	26		

Table (7) illustrates that general knowledge about HCV is improved among experimental as result of intervention program. Poor general knowledge about HCV is more among controls 53% compared with 1% for experimental while good knowledge about HCV is more prevalent among experimental;88% compared with 27% for controls. This difference among the experimental and controls are statistically significant .The table, illustrates that knowledge about Protection from hepatitis A&B is improved among experimental as result of intervention program. Poor knowledge about Protection from hepatitis A&B is more among controls; 71% compared with 4% for experimental while good knowledge about Protection from hepatitis A&B is more prevalent among experimental; 33% compared with 6% for controls. This difference among the experimental and controls are statistically significant .Also this table illustrates that knowledge about mode of transmission is improved among experimental as result of intervention program. Poor knowledge about mode of transmission is more among controls; 62% compared with 1% for experimental while good knowledge about mode of transmission is more prevalent among experimental; 54% compared with 15% for controls. This difference among the experimental and controls are statistically significant.

Also this table illustrates that knowledge about factors makes further damage of liver is improved among experimental as result of intervention program. average

knowledge about factors makes further damage of liver is more among controls; 74% compared with 13% for experimental while good knowledge about Factors makes further damage of liver is more prevalent among experimental; 87% compared with 26% for controls . This difference among the experimental and controls are statistically significant.

Table 8: Comparison between Experimental & Control groups regarding their Knowledge (Healthy diet and Total level of knowledge) after the intervention program

Knowledge' sub scores and total score	Experimental		controls		χ^2	P value
	No	%	No	%		
Healthy diet for persons infected with HCV score						
Poor	2	2	66	66	136.46	0
Average	5	5	23	23		
Good	93	93	11	11		
Total level of knowledge score						
Poor	1	1	6	68	107.27	0
Average	5	5	8	8		
Good	94	94	82	24		

Table (8) illustrates that knowledge about healthy diet for persons infected with HCV is improved among experimental as result of intervention program. Poor knowledge about healthy diet for persons infected with HCV is more among controls; 66% compared with 2% for experimental while Good knowledge about healthy diet for persons infected with HCV is more prevalent among experimental; 94 % compared with 24% for controls. This difference among the experimental and controls are statistically significant. The table illustrates that total level of knowledge for HCV is improved among experimental as result of intervention program. Poor total level of knowledge for HCV is more among controls; 68%compared with 1% for experimental while good total level of knowledge for HCV is more prevalent among experimental; 94 % compared with 24% for controls. This difference among the experimental and controls are statistically significant .

Table 9: Comparison between Experimental & Control groups regarding their Behavior after the intervention program

Behavior' subs cores and total score	Experimental		Controls		χ^2	P value
	No	%	No	%		
Life style behavior						
Poor	0	0	7	7	42.05	0
Average	10	10	45	45		
Good	90	90	48	48		
Protection of other						
Poor	0	0	39	39	112.58	0
Average	32	32	60	60		
Good	68	68	1	1		
Total behavior scores						
Poor	0	0	2	2	75.3	0
Average	3	3	58	58		
Good	97	97	40	40		

Table (9) illustrates that life style behavior for HCV is improved among experimental as result of intervention program. Poor life style behavior for HCV is more among controls; 7% compared with 0% for experimental while good life style behavior for HCV is more prevalent among experimental; 90 % compared with 48% for controls. This difference among the experimental and controls are statistically significant .As regard, protection of other for HCV is improved among experimental as result of intervention program. Poor protection of other for HCV is more among controls; 39% compared with 0% for experimental while good Protection of other for HCV is more prevalent among experimental; 68 % compared with 1% for controls. This difference among the experimental and controls are statistically significant . The table illustrates that total behavior score for HCV is improved among experimental as result of intervention program. Poor total behavior score for HCV is more among controls; 2% compared with 0% for experimental while good total behavior score for HCV is more prevalent among experimental; 97 % compared with 40% for controls. This difference among the experimental and controls are statistically significant .

Table 10: Comparison between Experimental & Control groups regarding their Health Related Quality Of Life (HRQOL) after intervention program

HRQOL domains	Experimental	controls	T test	P value
	Mean (SD)	Mean (SD)		
General Health	69.8(13.7)	29.3(27.5)	9.89	0
Bodily Pain	86.7(12.1)	44.9 (33.2)	11.81	0
Physical Functioning	89.9(13.8)	57.8(33.3)	7.48	0
Role Limitation Physical	54(50)	31 (46.5)	3.36	0.001
PCS	75.1(20.3)	45.8(31.6)	7.79	0
Social functioning	86.5(12.5)	41.7(38.8)	10.95	0
Role Limitation Emotional	99(10)	27.6(44.3)	15.7	0
Vitality	75.1(17.1)	38.8(27.8)	11.08	0
Mental health	80.8(8.3)	26.5(21.6)	23.45	0
MCS	81.7(14.8)	33.8(26.1)	15.9	0

Table (10) illustrates that mean of Physical Component Summary (PCS) and Mental Component Summary (MCS) are improved among experimental as result of intervention program and their items are more prevalent in experimental group compared with control group. This difference among the experimental and controls are statistically significant.

3. Discussion

The present case-control study aimed to determine the risk factors of hepatitis C virus infection in Kafr Elsheikh governorate. More over an intervention study was done to assess the impact of health education and level of health related quality of life using SF-36 to measure the quality.

The socio-demographic data were collected on the studied 250 HCV patients and 250 non HCV individuals showed that nearly two thirds of the cases were female (65.2%) while 56.8% of the controls were female. Males were 30% less risk to develop hepatitis C than females and this difference is statistically insignificant (OR= 0.7, 95% CI: 0.48-1.07).

The sex distribution among the studied cases was similar with that reported by **Kenny-Walsh (1999)** who found that the rate of hepatitis C infection appears to be more in women.

The study showed that the age of 45-55 years represents the highest percentage of HC cases (41.6%) compared to (23.6%) among the control and the age group from 45-55 years was

the most risky group to develop hepatitis C 89% higher than the group 25-35years with a statistically significant difference (P= 0.019).Our result corporate with that reported by **Muhammad and Jan (2005)** found that the highest incidence of chronic hepatitis C was found among age group from 41-50 years.

In the present study, the prevalence of hepatitis C was more common among rural populations 83.2% and rural populations were affected by HCV by 59% more than urban population. This difference is statistically significant (OR= 1.59, 95% CI: 1.03-2.48). Our result in accordance with **Frank et al. (2000)** found that in Egypt, HCV prevalence was very high (estimated among adults at 10% and 20% in urban and rural areas, respectively). Another study by **Tasawar et al. (2006)** found that the prevalence of hepatitis was higher (70%) in rural population as compared to urban population (30%).

The present study demonstrated that 26.8% of the hepatitis C cases had history of transfusion of blood or blood component and history of transfusion of blood or blood component was a significant risk factor for HCV infection (OR= 2.24; 95% CI= 1. 42-3.54) . This means that unsafe blood transfusion as an important factor that can share in the spread of hepatitis C virus, and this result add to similar results in many previous studies. **Darwish (1992)** cleared that in a study among 90 blood donors in Cairo, 14.4% were anti-HCV positive by RIBA testing. Also, **Darwish et al. (1993)** found that 26.6% among 188 blood donors were HVC positive. In addition, **Bassily et al. (1995)** explained that 22% among 163 donors were positive, with both of these studies were carried in Cairo.

In our study, the risk was 2.24 times among those had past history of blood transfusion 2.24 (1. 42-3.54). Our result was corporate with **Eassa et al. (2007)** found that the risk was 5 times among those had past history of blood transfusion.

The study results had also showed that 42.8% of the hepatitis C cases had history of unsterilized surgical equipment compared with 22.4% of the controls. History of use unsterilized surgical equipment was a significant risk factor for HCV infection (OR= 2.59; 95% CI=1.75-3.82) and this may due to the method of sterilization is not well developed in the hospitals during the time where the cases were arisen.

Our result was corporate with **Eassa et al. (2007)** found that the risk was 2.5 times among those had past history of unsterilized surgical equipment.

The study results declared that 30.4% of the hepatitis C cases had history of dental interference compared with 10% of the controls and the history of unsterilized dentate equipment was significant risk factor for HCV infection (OR= 3. 93; 95% CI=2.40 - 6.43) in the present study.

In our study, the risk was 4 times among those had past history of unsterilized dentate equipment with an odds ratio of 4 (95% CI=2.40 - 6.43). Our result was corporate with **Eassa et al. (2007)** found that the risk was 3 times among those have had past history of unsterilized dentate equipment.

The results of the present study have revealed dissatisfied level of knowledge and behavior among hepatitis C patients who attended outpatient clinic of Kafr Elsheikh Liver Research Center.

The study declared that mean of Physical Component Summary (PCS) and Mental Component Summary (MCS) and their items is more prevalent in control group compared with case group and this might reflect the negative role of hepatitis C virus on the quality of life of the patients. In our study, the mean of PCS and MCS were high in control group; accounting for 45.5% and 34.4%, respectively. Within the case group, however, the mean PCS and MCS was 88.4% and 81.1%, respectively.

Our results corporate with **Forton et al. (2006)** found that patients with chronic hepatitis C, even without major disease-related complications, perceive themselves to be unwell and have significant physiological effect on quality of life and as a result all the participants struggled to maintain a meaningful life.

After the implementation of the developed health educational program, the experimental group showed significant improvement in their knowledge compared with the control group.

These findings have appeared in agreement with the results of similar previous study conducted in El- Mansoura where the educational program was found to increase the studied samples' awareness and the level of knowledge about HCV infection ***(ElHoseiny, 2005)***.

Similar results were also reported by **Tawfik (2011)** where the great majority of his studied sample gave dissatisfied level of knowledge about HCV, but after implementing health educational program, the experimental group showed significant improvement in their knowledge about HCV compared with the control. Also, the majority of the experimental group showed a significant improvement of all studied behavior items, with a significant improvement in all health domains of the SF-36 measuring HRQOL compared with the control group as result of educational program **(Tawfik, 2011).**

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 **(Foster, 2009).**

Similarly**, Myra et al. (2008) and Paola et al. (2007)** have reported a significant improvement of the eight domains of SF-36 of HRQOL measurement of the studied sample of HCV patients after conducted to health education program .

Furthermore, **Ibrahim and Madian (2011)** conducted a study about the impact of health education program on the health related quality of life of HCV in Egypt. The authors denoted

that, after the implementation of health education program, experimental group was showed a significant improvement in their knowledge compared with control group. Also, 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. Comparing the health quality of life before and after the intervention program, the study revealed a significant improvement in physical and mental components summary and all health domains of SF-36 measuring HRQOL in the experimental compared with the control group.

4. Conclusion

The disease was more common in females than males; with male sex was in significant risk factor for the studied HCV disease.

- The age group (45-55) was significant risk factor for hepatitis C compared to age group (25-35).
- Hepatitis C was clearer in rural residence individuals and rural residence was significant risk factor.
- Illiterate and high school were significant risk factor for hepatitis C compared to university.
- The disease was slightly increased in married subjects. Marriage was insignificant risk factor.
- The disease was more abundant in unemployed. Unemployment was significant risk factor.
- Low and middle socioeconomic level more risky to develop hepatitis C compared to high socioeconomic level with a statistically significant difference.
- The disease was prevalent among those with history of transfusion of blood or blood component. History of transfusion of blood or blood component was a significant risk factor for HCV infection.
- The disease was prevalent among those with history of unsterilized surgical equipment. History of unsterilized surgical equipment was a significant risk factor for HCV infection
- The disease was prevalent among those with history of sharing instruments with others. History of sharing instruments with others was a significant risk factor for HCV infection.
- Hepatitis C was abundant among those who had taken parenteral antibilharzial medications. History of parenteral antibilharzial medications was a significant risk factor for HCV infection.
- Hepatitis C was clearer among those who had history of unsterilized surgical equipment. History of unsterilized surgical equipment was insignificant risk factor for HCV infection.
- The disease was more identify in persons who had circumcised. The circumcision was significant risk factor for HCV infection
- The results of the present study revealed dissatisfied level of knowledge and behavior among hepatitis c patients who attended outpatient clinic of Kafr Elsheikh Liver Research Center.

In the present study, 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.

As regard to hepatitis c patients' generic HRQOL, the program created a positive effect on PCS and MCS of SF-36 domains and all its' items as general health, bodily pain, physical functioning, role limitation physical, social functioning, role limitation emotional, vitality and mental health

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 findings have supported the previous reports of the positive effect of health education program on HRQOL of HCV patients.

5. Recommendations

Recommendation concerning the hospitals and specialized centers:

- The study recommends establishing developing a health education unit in each hospital or specialized centers.
- A full-time qualified nurses, and one social worker as well as part time psychiatrist are needed to carry out the following activities:

a) In and outpatient health education activities:.

- Educate infected HCV about HCV disease and how to live healthy with it, recommend them for hepatitis A and B vaccinations and inform where to access them and encourage return visits for vaccine completion.
- Incorporation of quality of life questionnaire in the periodic assessment of HCV to discover early hepatitis c patient at risk for physical, psychological, social and spiritual troubles or poor adherence.

b) Training programs for healthcare providers (medical and paramedical personnel):

- More attention should be given for the using of Personal Protective Equipment (PPE).
- Intensify attention should be given to infection control measures in contact with infected patients and methods of refuse disposal done in hospitals, specialized centers and out patients' linics.

Recommendation concerning community (population at risk and general population):

- Design and distribute booklet to inform community leaders about the public health and safety benefits of using infection control measures.
- Mass media campaigns about the HCV disease
- Improving and strengthening the announcement of the hot line for HCV.
- Focus attention for hidden risky groups of transmission of HCV infections (pharmacists, dentists, barber, and hairdressers).
- Special attention should be given to health screening and early detection programs of the high risk groups.
- All knowledge and behavior related to HCV should be integrated in the school curriculum of both general school and nursing school.

Recommendation concerning Ministry of Health (MOH) activities:

Allocate health inspectors to audit the infection control measures among barber, hair dressers, pharmacists, dentists

and hospitals to provide annual or bi-annual state certifications.

References

[1] ***Bassily S, Hyams KC, Fouad RA, Samaan MD and Hibbs RG (1995):*** A high risk of hepatitis C infection among Egyptian blood donors: The role of parenteral drug abuse. Am J Trop Med Hyg, 52(6): 503–5.

[2] ***Darwish NM (1992):*** Hepatitis C virus infection in blood donors in Egypt. J Egypt Public Health Association, 67(3-4): 223–36.

[3] ***Darwish MA, Raouf TA, Rushdy P, Constantine NT, Rao MR and Edelman R (1993):*** Risk factors associated with a high seroprevalence of hepatitis C virus infection in Egyptian blood donors. Am J Trop Med Hyg, 49(4): 440–7.

[4] ***Donald,A.(2010):***What is Quality of life? Hayward Medical Communication. 1(9). Available from: http://www.evidence-based-medicine. co. uk. Accessed on July 2, 2010.

[5] ***Eassa, S.; Eissa, M.; Sharaf, S. M.; Ibrahim, M. H. and Hassanein, O. A. (2007):*** Prevalence of Hepatitis C Virus Infection and Evaluation of a Health Education Program in El- Ghar Village in Zagazig, Egypt.

[6] ***EHIS (Egypt Health Issues Survey) (2015):*** Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. 2015. Egypt Health Issues Survey 2015. Cairo, Egypt and Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

[7] ***El Hoseiny, S. (2005):*** Preventive health education for family with hepatitis C virus infected member. Faculty of Ain Shams. Faculty of Nursing.

[8] ***Esmat, G. (2013):*** Hepatitis C in the Eastern Mediterranean Region. Eastern Mediterranean Health Journal, 19, 587-588.

[9] ***Forton, D.M.; Taylor-Robinson, S.D. and Thomas, H.C. (2006):*** Central nervous system changes in hepatitis C virus infection. Eur J Gastroenterol Hepatol. 2006; 18: 333–8.

[10] ***Foster, G.R. (2009):*** Quality of life considerations for patients with chronic hepatitis C. Journal of Viral Hepatitis; 16: 605-11.

[11] ***Frank, C.; Mohamed, M.K.; Strickland, G.T.; Lavanchy, D. and Arthur, R.R. (2000):*** The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt. Lancet, 355: 887–91.

[12] ***Hlla,T,h. and Dore, G.J.(2010):*** Cognitive function, mood and health-related quality of life in hepatitis C virus-infected individuals.

[13] ***Ibrahim, E.M. and Madian, A.A. (2011):*** Impact of Hepatitis C on Health-Related Quality of Life in Egypt. J Am Sci ; 7(11):430-439]. (ISSN: 1545-1003).

[14] ***Kenny-Walsh E (1999):*** Clinical outcomes after hepatitis C infection from contaminated anti-D immune globulin. Irish Hepatology Research in Uganda: a review of progress and challenges between 2001 and 2007". Health policy and planning, 28(1), 30-40

[15] ***Muhammad, N. and Jan, M.A. (2005):*** Frequency of Hepatitis C in Buner, NWFP. JCPSP, 15(1): 11–4.

[16] ***Myra, S.; Louise, O. and Debra, J. (2008):*** Living with hepatitis C and treatment: the personal experiences of patients. Journal of Clinical Nursing. 18: 2282–91.

[17] ***Paola, S.; Vincenzo, G. ; Assunta, N. ; Maria, L. and Maria,A.(2007):*** Impact of hepatitis C virus infection on lifestyle World J Gastroenterol; 13(19): 722-6.

[18] ***Tawfik, E.H. (2011):*** Impact of an educational program on Health Related Quality of Life among virus hepatitis C patients. Alexandria University. High Institute of Public Health.

[19] ***Tasawar, H. ; Zaib, U. and Maria, R. (2006):*** The Effects of Blood Groups, Sex, Marital Status , Residential Status, Ethnicity, Income and Age on The Prevalence of Hepatitis in The Patients Visiting Victoria Hospital, Bahawalpur Pakistan J. Zool. 38(1). 15-20.

[20] ***Waked, I.; Doss, W.; El-Sayed, M.H.; Estes, C. and Razavi, H. (2014):*** The current and future disease burden of chronic hepatitis C virus infection in Egypt. Arab JG;15(2):45-52***http://dx.doi.org/10.1016/j.ajg.2014.04.003.***

[21] ***World Health Organization (2014):*** Guidelines for the screening, care and treatment of persons with hepatitis C infection. available at http://www.who.int.