

Knowledge, Attitude and Lifestyle Changes among Chronic Hepatitis C Patients in Alexandria, Egypt: A Fear-Appeal Intervention

Sherine Gaber Hassan¹, Engy Mohamed El-Ghitany^{2,*} and Wafaa El-Sheikh³

¹ Dept. of Health Education and Behavioral Sciences, High Institute of Public Health, Alexandria University, Egypt

² Dept. of Tropical Health, High Institute of Public Health, Alexandria University, Egypt

³ Dept. of Gastroenterology, Faculty of Medicine, Alexandria University, Egypt

ingv.elghitany@gmail.com

Abstract: Background: Hepatitis C virus (HCV) infection is a public health threat particularly in Egypt. The current knowledge, attitude and behavior especially of chronically infected patients would determine the areas of defect to be targeted. Counseling and education about epidemiological and medical aspects of the disease would probably improve knowledge and attitude. To control infection, efforts should be spent to enhance perception and encourage healthy and safe behavior. Objectives: To assess HCV-related knowledge, attitude, risk behavior and changes of lifestyle in a sample of Egyptian chronic HCV patients and to evaluate the effect of a health education intervention program on these factors. Study Design: A randomized pre-post test was used in the study. Methods: Knowledge and attitude of 148 chronic HCV patients were assessed using specific scoring system set by the authors through a self-administered questionnaire. This questionnaire included questions about risky behaviors adopted by the patient before diagnosis and the changes encountered thereafter. Health education session was held using a fear-appeal method and posttest was done 6 months later to 46 subjects who continued the study. Results: participants showed poor knowledge and negative attitude. The most frequent potential risk factors were; repeated dentist visits (71.6%), hospitalization (66.9%), and using common sharp objects (48.6%). Diet control was the most prominent change following diagnosis. Counseling improved knowledge dramatically but had no effect on attitude and had improved behaviors although most of them did not reach a statistically significant degree. Conclusions: Chronic HCV patients have low standard body of knowledge and negative attitude about their disease. Corrections of malpractices following diagnosis were documented, but also unnecessary restrictions were adopted. Although health education evidently improved knowledge, the satisfactory changes in attitude and behaviors need to be further studied using more intense, frequent or various health education techniques.

[Sherine Gaber Hassan, Engy Mohamed El-Ghitany and Wafaa El-Sheikh **Knowledge, Attitude and Lifestyle Changes among Chronic Hepatitis C Patients in Alexandria, Egypt: A Fear-Appeal Intervention**] Journal of American Science 2012; 8(2): 73-79].(ISSN: 1545-1003). <http://www.americanscience.org>. 11

Keywords: Hepatitis C, Knowledge, Attitude, Behavior, Health education, Fear-appeal

1. Introduction

WHO estimates that about 170 million people, 3% of the world's population, are infected with HCV^{1,2} and 3-4 million persons are newly infected each year³. HCV infection is commonly referred to as the "silent epidemic"⁴ because there are no symptoms in the initial stages of the disease and as a consequence, many people infected may still be unaware of their status. However, it can slowly progress to end-stage cirrhosis and liver cancer⁵. Egypt has possibly the highest HCV prevalence in the world; 10%-20% of the general population are infected and HCV is the leading cause of HCC and chronic liver disease in the country⁶⁻⁸. High rates of infection are observed among all age groups although there are regional differences in the average overall prevalence^{3, 9}. Previous research has suggested that the Egyptian HCV epidemic results from the use of unsterile injection equipment during mass treatment of the general population with parenteral antischistosomal therapy¹⁰. Nevertheless, children and young adults have relatively high anti-HCV prevalence, but still less than that in the older population group. This situation suggests that HCV transmission continues in the country⁷.

HCV is spread primarily by direct contact with human blood. Transmission through blood transfusions that are not screened for HCV infection, through the reuse of inadequately sterilized needles, syringes or other medical equipment especially in dental treatment, or through needle-sharing among drug-users, is well documented. Other modes of transmission through social, cultural, and behavioral practices using percutaneous procedures (e.g. ear and body piercing, circumcision, tattooing) can occur if inadequately sterilized equipments are used¹¹. Sexual and prenatal transmission may also occur, although less frequently¹². HCV is not spread by sneezing, hugging, coughing, food or water, sharing eating utensils or casual contact¹¹, although there are household contacts with unexplained HCV infection¹³.

The manner in which patients perceive their illness is likely to influence many aspects of their behaviors including the likelihood of seeking medical care, compliance with medical advice, having good quality of life and accepting recommended lifestyle changes¹⁴. Dissemination of HCV-specific knowledge aiming at better perception or improvement of attitude and behaviors can be critical to public health efforts to prevent disease

transmission and to reduce HCV- related disability-adjusted life-years^{15, 16}.

Educational programs targeting chronic HCV patients should include knowledge about how to reduce the risk of transmission to others¹⁷, reassuring information for the patient regarding management of the disease¹⁸ and avoiding long-term complications. Chronic HCV patients may be able to slow down the workload of the liver and decrease the risk of cirrhosis and liver cancer¹⁹. This would be achieved through adherence to healthy behaviors (e.g. reduction in tobacco use and/or alcohol consumption)²⁰ and modifications in life style²¹ and dietary practices²⁰. Unnecessary restrictions as on dietary intake have also been observed in patients with chronic liver disease²². There are few data available regarding how many patients with hepatitis C infection change their lifestyle, adopting healthy behaviors and/or unnecessary restrictions^{23, 24}.

Knowledge, attitude and practice assessment studies are crucial steps to direct the attention towards certain deficient aspects of knowledge or malpractice. Accordingly, proper actions would be adopted. Therefore, the aim of this study was to assess the knowledge, attitude, risk behavior and changes of lifestyle in a sample of Egyptian chronic HCV patients and to evaluate the effect of a health education intervention program on these factors.

2. Patients and Methods

In this study a randomized pre-test post-test design was used after obtaining the approval of the High Institute of Public Health ethics committee. The study was conducted between March and December 2009. Two hundred patients with chronic HCV infection were randomly selected out of about 1000 patients attending El-Nokrashy Insurance Hepatology out-patient clinic, Alexandria, Egypt.

A standardized self-administered questionnaire was presented to each participant after obtaining an informed consent. The questionnaire comprised six sections investigating different areas; (1) Socio-demographic characteristics (gender, age, years of education, job status, income) (2) History of infection/disease (duration of symptoms, complications and treatment), (3) Knowledge about transmission, risk behaviors, symptoms, complications and treatment (4) Attitude towards hepatitis C infection and complications, (5) Previous at-risk behaviors (use of unsterilized tools, hospitalization, dentist visit, sexual behaviors; drug addiction), and (6) Lifestyle changes following diagnosis; diet, smoking, sexual life, drug intake and family life.

Knowledge was scored so that right answer was scored 2, "don't know" was scored 1 and wrong answer was scored 0 with a maximum total score of 46. General knowledge about hepatitis C (being a contagious or hereditary disease and the possibility of cure) had a maximum score of 6. Knowledge

about modes of transmission had a maximum score of 20, knowledge about symptoms of hepatitis C had a maximum score of 10, knowledge about complications had a maximum score of 6, knowledge about treatment and vaccination had a maximum score of 4. Then the total score was divided into poor, fair or good knowledge when (<60%), (60-80%) and (>80%) of the maximum score respectively has been achieved.

Regarding attitude: Answers were scored so that answers reflecting negative attitude was scored "1", neutral attitude was scored "2" and positive attitude was scored "3" with a maximum total score of 24. The total score was calculated as a proportion from the maximum one and classified into negative attitude (<33%), neutral attitude (34-66%) and positive attitude (>66%).

After completing the questionnaire, patients were invited to attend a lecture-discussion session about HCV infection. Only 46 patients were willing to attend and complete the post test. A one hour-session was conducted by the researchers explaining modes of transmission, symptoms, signs, complications and treatment of chronic HCV. Lifestyle changes recommendations following diagnosis of chronic HCV were stressed upon. Following the lecture, a 30 minutes discussion session was held about patients believes and attitude concerning HCV and all patients' queries were appropriately answered. The fear-appeal technique was used by stressing on complications and mode of transmission to enhance behavioral changes. Brochures summarizing the lecture contents were distributed to all participants at the end of the session.

Using the previously used self-administered questionnaire, the post test was conducted after six months interval at the date of the patients' regular checkup. Data were entered, processed and analyzed using *SPSS*, version 16. Frequencies were compared using chi square or fisher's exact test when appropriate. Continuous data were presented in means and standard deviations and compared using t-test, paired-samples t-test or ANOVA.

3. Results

A total of 148 chronic hepatitis C patients agreed to be included in the pre-test stage of the study of whom, 72.3 % were males. Nearly two thirds (66.9%) of the study subjects were aged 41-60 years, while 16.9% of them were aged 20-40 years. Regarding educational level, 38.5% had completed secondary education, while 14.9% were illiterate. Most of the patients (68.9%) were diagnosed as chronic hepatitis C patients since a maximum of five years. Only 15.5% of the studied sample received antiviral treatment while 61.5% of them didn't know the type of treatment they were receiving.

About half of the participants (49.3%) had poor knowledge about hepatitis C versus (1.4%) having good knowledge with a mean score of 29.9±4.5

(65.2%±9.8%). General knowledge about hepatitis C had a mean score of 3.2 ± 1.1 (53.2%±18.3%).

Mean score of knowledge about modes of transmission was 13.4 ± 2.7 (67.0%±13.5%) where 82.6%, 73.9% and 76.1% knew that hepatitis C can be transmitted by sharing sharp objects or tooth brush or through blood transfusion respectively. A substantial proportion (49.3%) of the sample thought that HCV can be transmitted through personal tools (as towel, spoon,... etc), 73% by mosquitoes bites, 35.8% by breathing and 60.8% by contaminated food. On the other hand, only 34.8% and 32.6% of the sample knew that the disease could be transmitted through sexual activities and from mother to child during pregnancy and labor respectively. Mean score of knowledge about symptoms was 6.08 ± 1.9 where 45.7% of patients thought that hepatitis C cannot be asymptomatic while 54.3% and 21.7% thought that fever and jaundice respectively are the symptoms of hepatitis C infection. The mean score of knowledge about complications was 4.7 ± 1.2 (78.2%±19.5%) while that of treatment and vaccination was 2.6 ± 1.1 (64.8%±27.5%).

Regarding attitude, 46.3% of the patients had neutral attitude towards hepatitis C and 53.3% had a negative attitude with a mean score of 17.0 ± 2.8 ; 33.8% of the patients believed that the end result of the disease is death and 67.6% stated that they are liable to complications; 50.0% and 74.3% of them believed that HCV infection would end up with either cancer or cirrhosis respectively. Only 16.9% of the participants believed that they can be cured.

The patients committed many potential risk behaviors prior to HCV diagnosis (Table 1), some of them were continued to be practiced after diagnosis. The most frequent risk behavior was repeated dentist visits (71.6%), hospitalization (66.9%), using common sharp objects (54.1%) and undergoing surgical procedures (48.6%). Most patients adopted lifestyle changes following diagnosis (Figure I). Diet habits modification was the most prominent modification adopted by the patients. Most patients started to use separate personal tools. Although sexual practice modifications were considerable, safe sex was the least adopted one.

Table 1: Frequencies of Potential Risk Factors of HCV Acquisition among the Studied Population

Risk factor	No. n= 148	%
Used common sharp objects (scissors, razors)	80	54.1
Sharing toothbrush with other person	15	10.1
Using non sterilized syringe or stitches	38	25.7
Tattoo	10	6.8
Labor by unprofessional health care worker	6	14.6*
Exposure to contaminated blood or needles in work	10	6.8
Repeated dentist visits	106	71.6
Hospitalization	99	66.9
IV Drug abuse	10	6.8
Surgical procedures	72	48.6
Extramarital sex	8	5.4

* (out of 41 female)

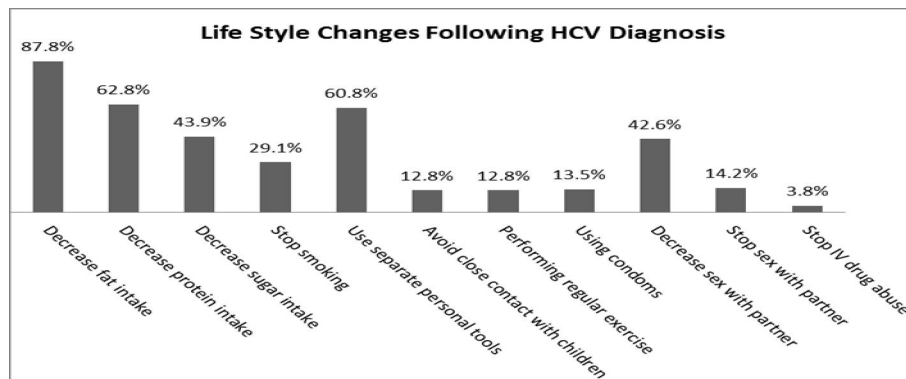


Figure I. The percentage of those who stopped smoking was calculated from the original smokers

Nearly one third of smokers had given up after the diagnosis of hepatitis. The least adopted behavior was performing regular exercise. Similar percentage unnecessarily avoided contact with their children.

Only 46 individuals attended the health education session and completed the posttest. Their mean age was 49.6 ± 11.9 which did not differ statistically from the original population (50.8 ± 10.4).

Also no sex or educational level difference was shown as 76.1% were males and 67.4% had a school education. The mean duration of HCV infection discovery was 4.5 ± 3.6 years.

There was a significant improvement of knowledge (Table 2) about modes of transmission, symptoms, and total knowledge with a mean score difference of 1.7 ± 4.2 , 1.7 ± 3.0 and 3.4 ± 7.3

respectively. Regarding attitude (Table 2), there was an insignificant deterioration of attitude towards

HCV with a mean score difference of -0.3 ± 4.5 .

Table 2: Knowledge and Attitude Changes Following Health Education Intervention

Variable	Pre-test n=46 mean±SD	Post-test n=46 mean±SD
General knowledge about hepatitis C	4.7±1.2	5.0±1.1
Knowledge about transmission	17.1±4.4	18.8±3.6**
Knowledge about symptoms of hepatitis C	5.8±1.8	7.5±3.1**
Knowledge about complications	4.6±1.1	4.3±1.5
Knowledge about vaccination& treatment	1.3±0.6	1.4±0.8
Total knowledge	31.8±5.9	35.2±5.4**
Attitude	18.3±3.7	18.0±3.3

**significant at $p < 0.05$

Neither sex nor educational level had significant impact on changes in knowledge ($p = 0.67$ and 0.83 respectively). Sex and level of education had also no relation to changes in attitude following the program ($p = 0.39$ and 0.14 , respectively).

Although most of the lifestyle parameters were improved after the intervention, they did not reach statistically significant levels (Table 3).

Table 3: Lifestyle Changes Following Health Education Intervention

Life Style Changes	Pre-test n=46		Post test n=46		p-value
	No.	%	No.	%	
Decrease intake of fat					
No	10	21.7	3	6.5	0.07
Yes	36	78.3	43	93.5	
Decrease intake of sugars					
No	25	54.3	16	34.8	0.08
Yes	21	45.7	30	65.2	
Decrease intake of animal proteins					
No	19	41.3	16	34.8	0.68
Yes	27	58.7	30	65.2	
Stop smoking					
Not applicable	23	50.0	23	50.0	0.35
No	9	19.6	5	10.9	
Yes	14	30.4	18	39.1	
Using condoms					
Not applicable	12	26.1	12	26.1	0.08
No	29	63.0	20	43.5	
Yes	5	10.9	14	30.4	
Decrease sex with partner					
Not applicable	3	6.5	3	6.5	0.19
No	23	50.0	17	37.0	
Yes	20	43.5	26	56.5	
Absenteeism					
Not applicable	3	6.5	3	6.5	0.02**
No	36	78.3	26	56.5	
Yes	7	15.2	17	37.0	
Stopping extra-marital sex					
Not applicable	42	91.3	42	91.3	0.49
No	2	4.3	1	2.2	
Yes	2	4.3	3	6.5	
Use separate personal tools					
No	29	63.0	22	47.8	0.05
Yes	17	37.0	24	52.2	
Stop I.V drug abuse					
Not applicable	43	93.5	43	93.5	0.59
No	2	4.3	2	4.3	
Yes	1	2.2	1	2.2	
Avoid close contact with children					
Not applicable	2	4.3	2	4.3	0.22
No	36	78.3	40	87.0	
Yes	8	17.4	4	8.7	
Regular exercise					
No	37	80.4	32	69.9	0.27
Yes	9	19.6	14	30.4	

** significant at $p < 0.05$.

The proportion of patients who diminished fat contents in diet was raised from 78.3% to 93.5% and those who reduced sugar intake increased from 45.7% to 65.2% while those who restricted animal protein intake varied from 58.7% to 65.2% before and after intervention respectively.

Regarding sexual habits, the percent of participants using condom increased from 10.9% to 30.4% following the intervention. Patients reporting decrease sexual activity with partner increased from 43.5% to 56.5%. Only two patients reported extra-marital sex, one of them stopped after the intervention program. There was also a significant increase of absenteeism among patients from 15.2% to 37%.

The results revealed that the percent of patients giving up smoking was raised from 60.86% to 78.26% -calculated from the number of smokers-following the intervention, and the percent of patients performing regular exercise increased from 19.6% to 30.4%. However, there was no cessation of drug abuse among those admitting I.V drug.

There was an increase of participants who were using separate personal tools (from 37.0% to 52.2%) and a decrease of patients avoiding contact with their children (from 17.4% to 8.7%).

4. Discussion

Chronic liver disease is a devastating condition in Egypt requiring prompt attention. For many decades, this was mainly due to the longstanding endemicity of schistosomiasis. The emergence of HCV infection contributed massively to this situation. The prevalence of HCV in Egypt is considered the highest worldwide. Having no commercial vaccine against HCV infection, the public health efforts are the cornerstone for control. These efforts should primarily be directed towards the primary preventive measures; mainly improving knowledge, awareness and perception aiming at reducing transmission and better quality of life. Knowledge of the study group was assessed quantitatively as well as qualitatively. The results revealed that it was significantly low as 49.3% of the patients had poor knowledge regarding all aspects of HCV. Knowledge about complications of the disease got the highest score (78.17%±19.5%). Patients had not only deficient knowledge, but they have also wrong conception. There was over-estimation of the ability of the virus to be transmitted by personal tools (as towel, spoon..etc), mosquitoes bites, breathing and contaminated food. There was also a low level of knowledge about the possibility of HCV to be transmitted sexually and perinatally. These misconceptions will either lead to adopting unnecessary restriction as avoiding contact with children and sharing food or practicing risky behaviors such as practicing unsafe sex. Eventually, poor quality of life and continuous disease transmission would be expected to exist. The low level of knowledge among patients was documented

among chronic hepatitis C patients in different parts of the world as Turkey²⁵, USA^{26,27}, and Pakistan²⁸.

More than half of the sample had negative attitude towards hepatitis C as about one third of the participants believed that the end result of the disease is death while one half and three quarters of them believed that they will end up with cancer and cirrhosis respectively. More than two thirds of the patients stated that they are liable to complications while only 16.9% of them thought that hepatitis C can be cured. This attitude can be explained by the relative high knowledge of patients about complications of hepatitis (4.69±1.17). The negative attitude among the present sample is consistent with the results of the study conducted in France where more than half of patients (59%) thought that HCV was always associated with a fatal outcome whereas 3% thought that they would stay healthy²³. Other studies also found high perceived severity and increased distress among chronic hepatitis C patients²⁹.

Similar to the findings of a study conducted in Greater Cairo³⁰, the most frequent risky behaviors among the present sample were repeated dentist visits (71.6%) and hospitalization (66.9%). The high percentages of using common sharp objects (54.1%) and sharing of syringe (25.7%) are comparable to the results of a study conducted in rural areas in upper Egypt⁹. The clinic where the present study was conducted is serving hepatitis C patients from Alexandria city and its rural surroundings. For decades, sharing sharp objects was a common risky behavior in rural areas.

The highest changes in life style following hepatitis diagnosis were concerning diet particularly reducing fat intake followed by proteins and sugar. The current findings are similar to many studies revealing that patients follow a more healthy diet low in fat and sugar following hepatitis C diagnosis^{23,24,31}. As regards sexual life, a high percentage of patients reported changes in their sexual life either in the form of decreased sexual intercourse frequency, absenteeism or using condom. In agreement with these results, studies conducted in USA and Europe revealed similar changes in sexual life of hepatitis C chronic patients^{23,24,31}.

It was obvious that many hepatitis C patients tried to adopt better lifestyle practice (more healthy diet, cessation of smoking), but they also started unnecessarily behaviors such as avoiding close contact with their children and using separate utensils. This improper practice can be attributed to the poor knowledge and the wrong believes among the study group that hepatitis C can be transmitted through breathing (35.8%) and sharing food utensils (49.3%).

Regarding the effect of the health education program; only 46 individuals showed interest in attending and completing the posttest. This may be attributed to either the negative attitude or the belief that they had enough knowledge got from their

consultants. We did not find any relation between completing the study and sex, age, level of education or duration since diagnosis. There was a significant improvement of knowledge six months following the health education sessions among the intervention group especially knowledge concerning modes of transmission and symptoms of the disease. This result supports the results of other studies about the long term effect of educational intervention on patients' knowledge^{26, 27, 32, 33}.

Regarding the insignificant deterioration of attitude towards hepatitis C, this may return in part to the fear-appeal technique used during the session to enhance lifestyle changes and also to the appearance of complications of the disease or drug side effects during the six months interval between the intervention and the post-test.

Although most of the lifestyle practices after intervention showed changes towards the better ones, only few were statistically significant, most probably due to the small sample size. The reported reductions in fat, animal protein and sugar intake were insignificant ($p=0.065$, 0.678 , 0.078 respectively). These reductions in almost all food types may be attributed to decrease of the total amount of food intake rather than any specific item.

Regarding sexual life, although only safe sex was explained and recommended, there were overreactions regarding sex practices. There was insignificant increase in condom use ($p=0.079$). There was a decrease in the frequency of sexual intercourse and moreover a significant increase in absenteeism ($p=0.017$); both were not recommended in the intervention. These changes may be caused by the improved patients' knowledge about the possibility of hepatitis C transmission by sex (percentage of right answers raised from 34.8% to 78.7% following the intervention). It could also be influenced by the concern of the partner and social stigma of the disease. A special attention should be focused in further studies on the knowledge and attitudes of households particularly partners and awareness programs should be tailored. Another possible explanation is the fear-appeal technique used during the session. A focus group study conducted in Massachusetts, USA discovered that newly diagnosed hepatitis C patients prefer that the educational materials convey an optimistic message³⁴ and focus on how to cope physically and emotionally with hepatitis C.

A higher percentage of patients reported stopping smoking (39.1% versus 30.4% before the program) and practicing exercise (30.4% versus 19.6% before the program). The percentage of patients that avoided close contact with children dropped from 17.4% to 8.7% following the intervention that can be explained by the improvement in knowledge about the modes of transmission of hepatitis C.

The fear-appeal technique had positive results on the diet behavior, smoking and exercise of the

patients which is in agreement with other studies using fear-appeal to promote behavior changes as diverse as stop smoking³⁵, breast examination³⁶, and condom use³⁷. However, the changes in sexual life and increase use of separate personal tools raise the question about using this technique with patients having such a high negative attitude towards their disease.

In conclusion, chronic HCV patients had low standard body of knowledge and negative attitudes towards their illness. The most common practices considered as potential source of infection were iatrogenic. Diagnosis of the disease had positive impact on behaviors. Health education using fear-appeal technique significantly improved knowledge but did not affect the attitude. Although it had also positive impact on some practices especially those which may transmit the infection, it had no or negative effect on others.

Acknowledgement:

The authors would like to thank Dr. Mahmoud for helping us recruiting the participants. Special thank is given to El-Nokrashy hospital team and health insurance authority for their kind cooperation. We are also grateful to all patients participated with us in this study.

Declarations:

Funding: All funds were provided by the authors.

Competing interests: None declared

Ethical approval: Were obtained from the Ethics Committee of High Institute of Public Health.

Corresponding author

Engy Mohamed Ali El-Ghitany,
Tropical Health Department, High Institute of Public Health, Alexandria University, Egypt.-165 El-Horreya Avenue, Alexandria, Egypt
ingy.elghitany@gmail.com

References:

- 1- WHO. Hepatitis C. Fact sheet No. 164. Geneva, World Health Organization, 2009.
- 2- Global surveillance and control of hepatitis C. Report of a WHO Consultation organized in collaboration with the Viral Hepatitis Prevention Board, Antwerp, Belgium. *J Viral Hepatol.*, 1999; 6: 35- 47.
- 3- Alter MJ. Epidemiology of hepatitis C virus infection. *World Journal Gastroenterology*, 2007; 13(17):2436-41.
- 4- Kim W. The burden of hepatitis C in the United States. *Hepatology*, 2002; 36(5) (Suppl. 1): S30-4.
- 5- Alter MJ. Epidemiology of hepatitis C. *Hepatology*, 1997; 26(Suppl 1): S62-5.
- 6-El-Zayadi A, Abaza H, Shawky S, Mohamed M K, Selim O, Badran HM. Prevalence and epidemiological features of hepatocellular carcinoma in Egypt—a single centre experience. *Hepatology*, 2001; 19: 170-9.
- 7-Habib M, Mohamed MK, Abdel-Aziz F, Magder LS. Hepatitis C virus infection in a community in the Nile Delta: risk factors for seropositivity. *Hepatology*, 2001; 33:248-53.

- 8-Hassan MM, Zaghloul AS, El-Serag HB, Soliman O, Patt YZ, Chappell CL, et al. The role of hepatitis C in hepatocellular carcinoma—a case control study among Egyptian patients. *J. Clin. Gastroenterol.*, 2001; 33:123-6.
- 9- Medhat A, Shehata M, Magder LS, Mikhail N, Abdel-Baki L, Nafeh M, et al. Hepatitis C in a community in Upper Egypt: risk factors for infection. *Am J Trop Med Hyg.*, 2002; 66(5):633-8.
- 10- Frank C, Mohamed MK, Strickland GT, Lavanchy D, Arthur RR, Magder LS, et al. The role of parenteral antischistosomal therapy in the spread of hepatitis C in Egypt. *Lancet.*, 2000; 355:887-91.
- 11- WHO. Hepatitis C. Fact sheet no. 204. Geneva, World Health Organization, 2009.
- 12- Infectious Diseases and Immunization Committee, Canadian Paediatric Society (CPS). Vertical transmission of the hepatitis C virus: Current knowledge and issues. *Paediatr Child Health*, 2008;13(6):529-34.
- 13- Health Canada. Prevention and control of hepatitis C. Guidelines and recommendations. *Can Commun Dis Rep.*, 1995; 21(Suppl 2):1-18.
- 14- Fontana R. The patient's perspective in hepatitis C. *Hepatol.*, 2004; 39(4): 903-5.
- 15- Fraenkel L, McGraw S, Wongcharatrawee S, Garcia-Tsao G. Patients' experiences related to anti-viral treatment for hepatitis C. *Patient Educ Couns.*, 2006; 62: 148-55.
- 16- National Cancer Institute. Health Information National Trends Survey. National Cancer Institute, Bethesda, MD (USA); 2007.
- 17- Straits-Troster K. Psychiatric and substance use disorder comorbidity with hepatitis C. *Psychiatric Annals*, 2003; 33(6): 362-8.
- 18- Alter M. Prevention of spread of hepatitis C. *Hepatol.*, 2002; 36(5)(Suppl. 1): S93-8
- 19- El-Serag H. Hepatocellular carcinoma and hepatitis C. *Hepatol.*, 2002; 36(5)(Suppl. 1): S74-S83
- 20- Blanchard CM, Denniston MM, Baker F, Ainsworth SR, Courneya KS, Hann DM, et al. Do adults change their lifestyle behaviors after a cancer diagnosis?. *Am J Health Behav.*, 2003; 27: 246- 56.
- 21- Siston AK, Knight SJ, Slimack NP, Chmiel JS, Nadler RB, Lyons TM, et al. Quality of life after a diagnosis of prostate cancer among men of lower socioeconomic status: results from the Veterans Affairs Cancer of the Prostate Outcomes Study. *Urology*, 2003; 61: 172-8.
- 22- Badruddin S, Jafri S, Ahmed A, Abid S. Dietary practices and beliefs of patients with chronic liver disease. *J Pak Med Assoc.*, 1999; 49: 216-20.
- 23- Castera L, Constant A, Bernard PH, De Ledinghen V, Couzigou P. Lifestyle changes and beliefs regarding disease severity in patients with chronic hepatitis C. *J Viral Hepatol.*, 2006; 13: 482-8.
- 24- Fabris P, Tositti G, Giordani MT, Baldo V, Grasso A, Pignattari E, et al. Assessing patients' understanding of hepatitis C virus infection and its impact on their lifestyle. *Aliment Pharmacol Ther.*, 2006; 23: 1161-70.
- 25- Tiftikçi A, Atuş O, Tözün N. Awareness of hepatitis C virus transmission routes among patients, their household contacts and health care staff: Does perception match the reality? *The Turkish Journal of Gastroenterology*, 2009; 20(2):104-7.
- 26- Gupta K, Romney D, Briggs M, Benker K. Effects of a brief educational program on knowledge and willingness to accept treatment among patients with hepatitis C at inner-city hospitals. *J Community Health.*, 2007; 32 (4): 221-30.
- 27- Beste LA; Straits-Troster K; Zickmund S; Larson M; Chapko M; Dominitz JA. Specialty care and education associated with greater disease-specific knowledge but not satisfaction with care for chronic hepatitis C. *Aliment Pharmacol Ther.*, 2009;30(3):275-282.
- 28- Moiz salahuddin M, Abdul Rauf MU, Noorani MM. Knowledge of patients attending free hepatitis clinic at civil hospital Karachi about hepatitis 'B' and 'C'. *Me d i c a l C h a n n e l*, 2010; 16(3): 365-7.
- 29- Constant A, Castera L, Quintard B, Bernard P H, De Ledinghen V, Couzigou P, et al. Psychosocial factors associated with perceived disease severity in patients with chronic hepatitis C: relationship with information sources and attentional coping styles. *Psychosomatics*, 2005; 46:25-33
- 30- Jimenez A P, Sharaf Eldin N, Rimlinger F, El-Daly M, El-Hariri H, El-Hoseiny M, et al. HCV iatrogenic and intrafamilial transmission in Greater Cairo, Egypt. *Gut.*, 2010; 59:1554-60
- 31- Scognamiglio P, Galati V, Navarra A, Longo MA, Aloisi MS, Antonini MG, et al. Impact of hepatitis C virus infection on lifestyle. *Gastroenterol.*, 2007; 13(19): 2722-6.
- 32- Davison JW, Hansen EC, Sullivan NM, Meaghan F, Splan MF, Dominitz JA. Effectiveness of a hepatitis C group education class in Veterans Administration treatment settings. National viral hepatitis prevention conference. Washington DC. December 5-9;2005.
- 33- Surjadi M, Torruellas C , Ayala C , Hal F, Yee HF, Khalili M. Formal patient education improves patient knowledge of hepatitis C in vulnerable populations. *Dig Dis Sci.*, 2011; 56:213-9.
- 34- Massachusetts Department of Public Health, Market Street Research, Policy Studies, Inc. Attitudes about hepatitis C education campaign for people newly diagnosed with hepatitis C. Cambridge, Massachusetts (USA): Market Street Research, Inc; 2001.
- 35- Padmawati RS, Ng N, Prabandari YS, Nichter M. Smoking among diabetes patients in Yogyakarta, Indonesia: cessation efforts are urgently needed. *Trop Med Int Health.*, 2009; 14 (4): 412-9.
- 36- Ruitter RAC, Kok G, Verplanken B, Brug J. Evoked fear and effects of appeals on attitudes to performing breast self-examination: an information-processing perspective. *Health Education Research*, 2001;16(3): 307-19. (abstract)
- 37- Johnson CS, Struckman-Johnson D, Gilliland RC, Ausman A. Effect of Persuasive Appeals in AIDS PSAs and Condom Commercials on Intentions to Use Condoms. *Journal of Applied Social Psychology*, 1994; 24(24): 2223-44.

1/5/2012