

Nurses' Knowledge and Attitudes Toward Hepatitis C Viral Infection at the National Institute of Cardiovascular Diseases, Bangladesh

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Abstract

This study aimed to assess nurses' knowledge and attitudes regarding Hepatitis C viral infection. A descriptive cross-sectional study was conducted among 200 randomly selected nurses at the National Institute of Cardiovascular Diseases, Bangladesh. Data were collected using a semi-structured questionnaire and analyzed with SPSS version 22.0. Descriptive analysis and Pearson Chi-square tests were applied, with a p-value of less than 0.05 considered statistically significant. The mean age of the participants was 31.8 years, with 54.5% falling within the 23-33 age range and 75.0% being female. Overall, nurses' knowledge about Hepatitis C was satisfactory, with 66.0% of participants scoring between 50-69%. About 74.5% (95% CI: 67-80) of nurses were aware that Hepatitis C could lead to cirrhosis, while 24.0% (95% CI: 18-30) disagreed that Hepatitis C was linked to an increased risk of liver cancer. The study also found that 56.0% (95% CI: 48-62) of participants avoided examining patients diagnosed with Hepatitis C. Additionally, 33.5% (95% CI: 26-40) reported wearing gloves, and 46.5% (95% CI: 39-53) believed that preventive care measures could protect them from infection. Over two-fifths (46.1%) did not frequently worry about acquiring Hepatitis C due to their work, and 2.9% strongly agreed that their profession had a responsibility to treat people infected with Hepatitis C. Age ($p=0.002$) and educational qualification ($p=0.000$) were significantly associated with nurses' knowledge and attitudes. The study recommends regular infection control training, adherence to infection control practices, and implementation of preventive measures for all hospital nurses to reduce the risk of Hepatitis C viral infection.

Introduction

Hepatitis causes a form of liver inflammation and is also a highly infectious blood-borne disease. Acute hepatitis C, which represents the first six months of infection, is self-resolving in almost one-fifth of the cases but does not confer permanent immunity. Most of the infected people are not aware of their HCV-positive status due to a lack of disease-specific symptoms and go on to develop chronic hepatitis (EASL, 2011). This represents a challenge, as many infected people do not feel the need to be tested for the disease and remain undiagnosed. Though no vaccine is available, the disease is preventable and can be successfully treated and cured as well (Tiftikci and Tozun, 2009). Viral hepatitis leads to almost one million deaths in the world every year. Hepatitis C virus infection appears to be endemic in most parts of the world; more than 3% of the world population (200 million people) are infected with the Hepatitis C virus (Wands, 2004). According to the WHO report, about 170 million people, almost 3 percent of the world population, are infected with HCV, however, more than 3 million people are newly infected each year (Yaghi et al. 2010). In Bangladesh 5% prevalence has been reported in a work done by



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Japanese group (Akbar et al. 1997); other studies have reported extremely low prevalence of HCV in Bangladesh (Khan et al. 1993). Another report in Bangladesh has been found identifying HCV to be the etiological agent in a little over 24% of patients with chronic liver diseases (Khan et al. 1995). HCV is known to be spread primarily by direct contact with human blood. Transmission through the reuse of inadequately sterilized needles, syringes or other medical equipment, especially in dental treatment, also transmission through needle-sharing among drug-users, and blood transfusions that are not well screened for HCV infection are well documented. The infection lasts for decades for a person to develop serious complications due to chronic HCV; it is usually slowly progressive (Van de Mortel, 2002). Moreover, HCV-infected people serve as a reservoir for transmission of infection to others if left untreated (Basal et al. 2011). Having adequate knowledge and the right attitudes toward Hepatitis C virus (HCV) infections is crucial for preventing its spread. Unfortunately, lack of awareness and understanding about Hepatitis C in the community often results in misinformation, missed prevention and treatment opportunities, and the stigmatization of infected individuals in the workplace, within families, and among community members. This is particularly concerning for at-risk communities, as missed prevention opportunities can result in the further spread of HCV (Basal et al., 2011). Health personnel play a crucial role in preventing the disease by improving their knowledge and educating patients, since they have close contact with individuals infected with hepatitis (Ghahramani and Mohammad, 2006). This study was conducted to assess nurses' knowledge and attitudes regarding Hepatitis C viral infection.

Materials and methods

Study design

This cross-sectional descriptive study was carried out among nurses working at the National Institute of Cardiovascular Diseases (NICVD), Bangladesh, to assess their knowledge and attitude regarding hepatitis C viral infection.

Setting and sample

A list of a total of 1010 nurses was collected from the National Institute of Cardiovascular Diseases (NICVD), the concerned authority, during January-October 2016. The list of nurses working in the hospital was used as a sampling frame from which a total of 200 study participants were recruited for data collection using a systematic random sampling technique. The National Institute of Cardiovascular Diseases (NICVD), Bangladesh, is made up of 15 departments. With the use of random numbers, 8 departments were selected using a stratified random sampling technique. A total of 25 study participants were selected from each of the 8 randomly selected departments in the National Institute of Cardiovascular Diseases (NICVD), Bangladesh. The questionnaire used in this study was pre-tested to ensure its validity and reliability. The study participants were selected randomly from each of the study clusters in the National Institute of Cardiovascular Diseases (NICVD), Bangladesh. The inclusion criteria were all the nurses working at NICVD, Bangladesh and those nurses who were available and willing to participate during the period of the study.

Measurements/Instruments

In this study, a semi-structured self-administered questionnaire was created to collect information. The questionnaire was divided into six sections: socio-demographic details, general knowledge about Hepatitis C, routes of transmission, prevention methods, protective measures against infection, and the participants' attitudes towards Hepatitis C.

Data collection Procedure:

Data was collected using the developed semi-structured questionnaire during January to October 2016. The researcher contacted the study participants in their respective departments in the National Institute of Cardiovascular Diseases (NICVD), Bangladesh. The researcher started with an explanation about the purpose of the current study and its data collection methods to the nursing leadership and requested their participation in this study. The study participants who met the eligibility criteria were recruited as per the inclusion criteria. The recruited study participants were asked to complete the informed consent form before participating.

Data analysis

All the collected data were coded numerically and entered into SPSS 22.0 version for analysis. Descriptive statistical analysis was used to calculate the frequencies and percentages. The descriptive analysis was presented as tables, where some analyses were performed using the Pearson Chi-square test and a p-value of at least than 0.05 was considered a significant level.

Ethical consideration

Institutional Review Board (IRB) approval has been obtained from the Institutional Faculty Ethics Committee (FAHS-REC/DIU/2017/1007).

Results

Socio-demographic Information of the respondents

The mean age of the study participants was 31.81 (SD±16.70) years. Slightly above half (54.5%) of the study participants were in the age group 23-33 years, followed by 26.5% who were in the age group 34-44 years. Three-fourths (75.0%) of the study participants were females, and the rest were males. Exactly half of the study participants (50.0%) were staff nurses, followed by 36.0% senior staff nurses. A little more than half of the (52.0%) of the study participants were married, and the rest were unmarried. In respect of professional status, more than one-third (38.0%) of the study participants had a diploma in nursing, followed by more than one-fourth (28.0%) B.Sc. in Nursing, and a very few of them had M.Sc., MPH and others (Table 1).

Table 1: Socio-demographic Characteristics of the respondents (n=200)

Variables	Frequency	Percentage
Age (years)		
≤22	17	8.5
23-33	109	54.5
34-44	53	26.5
≥45	21	10.5
Mean± SD	31.8±16.7	
Gender		
Male	50	25.0
Female	150	75.0
Designation		
Staff Nurse	100	50.0
Senior Staff Nurse	72	36.0
Supervisor	17	8.5
Others	11	5.5

Marital status		
Married	160	80.0
Unmarried	40	20.0
Educational Qualification		
Diploma in Nursing	76	38.0
B.Sc. in Nursing	56	28.0
M.Sc. in Nursing	22	11.0
MPH	35	17.5
Others	11	5.5

General knowledge on Hepatitis C

Table 2 shows the general knowledge of study participants based on hepatitis C. Majority of the study participants (84.5%) stated that hepatitis C is caused by virus, where around three-fourths of them (74.5%) of them mentioned that hepatitis could lead to cirrhosis and only 24.0% of them did not agree that hepatitis C was associated with increased risk of liver cancer. More than one-fourth of them (29.0%) agreed that a person could be infected with hepatitis C and show no symptoms of the disease. The majority of the study participants (78.5%) agreed that people with hepatitis should restrict their alcohol intake.

Routes of Transmission of Hepatitis C

The majority of the study participants (80.0%) agreed that Hepatitis C can be transmitted through needle and sharps, while 26.0% did not agree that it can be transmitted through sexual intercourse. Most of the study participants (70.0%) reported that hepatitis C can be transmitted through close personal contact, and only 28.0% of them agreed that it can be transmitted through air in an enclosed environment (Table 2).

Ways of preventing Hepatitis C infection

More than two-fifths (46.5%) of the study participants mentioned that hepatitis C could be prevented through vaccination. The majority of them (77.5%) stated that hepatitis-C could also be prevented through proper disposal of sharps, needles and blood. More than seven-tenths (72.0%) mentioned that hepatitis C could be prevented by avoiding casual sex and multiple sexual partners; however, more than two-thirds (69.0%) mentioned that avoiding drinking contaminated water could not prevent hepatitis C (Table 2).

Measures taken to protect against hepatitis C infection

Around two-thirds (65.5%) of the study participants believed that it could be protected through wearing gloves, 26.5% of them mentioned adequate disposal of sharps, whereas 31.5% stated that it could be protected by multivitamin/blood tonic (Table 2).

Table 2: Knowledge, Transmission Routs, Prevention and Protection Measures of Hepatitis C (n=200)

Items	True n (%)	False n (%)
General knowledge on hepatitis C		
Hepatitis C is caused by a virus	169(84.5)	31(15.5)
Hepatitis C is caused by bacteria	44(22.0)	156(78.0)
Hepatitis C is a serious disease	136(68.0)	64(32.0)
Hepatitis C can lead to cirrhosis	149(74.5)	51(25.5)

Hepatitis C is associated with an increased risk of liver cancer	152(76.0)	48(24.0)
A person can be infected with Hep C and show no symptoms	58(29.0)	142(71.0)
There is a pharmaceutical treatment available for hepatitis	108(54.0)	92(46.0)
HIV is easier to catch than hepatitis C	92(46.0)	108(54.0)
A person can have hep-C antibodies without being currently infected	90(45.0)	110(55.0)
People with hepatitis should restrict their alcohol intake	157(78.5)	43(21.5)
Once the patient has had hepatitis C, they cannot catch it again	143(71.5)	57(28.5)
Routes of transmission of hepatitis C		
Blood and blood products	133(66.5)	67(33.5)
Needles and sharp	160(80.0)	40(20.0)
Sexual intercourse	148(74.0)	52(26.0)
Faeco-oral	124(62.0)	76(38.0)
Close personal contact	140(70.0)	60(30.0)
Through the air in an enclose environment	56(28.0)	144(72.0)
Hepatitis C can be transmitted as a nosocomial Infection	113(56.0)	87(43.5)
Hepatitis C can also be widely transmitted like HIV/ AIDS	143(71.5)	57(28.5)
Health workers are at risk of hep-C infection by their work	145(72.5)	55(27.5)
Ways of preventing hepatitis C infection		
Vaccination	93(46.5)	107(53.5)
proper disposal of sharps, needles and blood	155(77.5)	45(22.5)
Avoid needle/ sharps injury	156(78.0)	44(22.0)
Avoid casual sex and multiple sexual partners	144(72.0)	56(28.0)
Avoid drinking contaminated water	62(31.0)	138(69.0)
Avoid well-cooked food well cooked	109(54.5)	91(45.5)
Hep-C patients should be restricted from working in the food industry	80(40.0)	120(60.0)
Measures taken to protect against hepatitis C infection		
Wearing gloves	131(65.5)	69(34.5)
Wearing goggles	73(36.5)	127(63.5)
Adequate disposal of sharps	147(73.5)	53(26.5)
Avoid patients diagnosed with hepatitis B	112(56.0)	88(44.0)
Multivitamin/blood tonic	63(31.5)	137(68.5)

Attitudes regarding hepatitis C

Table 3 presents the attitudes towards Hepatitis C among the study participants. It shows that more than two-fifths (46.1%) of participants disagreed with the statement that they frequently worry about acquiring Hepatitis C due to their work. Only 2.9% strongly agreed that their profession has a responsibility to treat people infected with Hepatitis C. Additionally, 15.7% agreed that they try to avoid caring for patients infected with Hepatitis C, while 34.8% strongly agreed that all patients undergoing surgery should be tested for Hepatitis C to protect the staff caring for them. The majority of participants (70.6%) disagreed with the statement that the way a patient contracted Hepatitis C influences how they should be treated. More than two-fifths (45.1%) agreed that touching someone infected with Hepatitis C does not make them uncomfortable, and only 10.3% disagreed with the statement, "I can't always follow standard precautions because my patients need to come first."

Table 3: Distribution of Respondents Based on Attitudes Regarding Hepatitis C (N=200)

Variables	Strongly Disagree	Disagree	Agree	Strongly Agree
Frequently worry about acquiring Hep-C because of my work	16(8.0)	94(47.0)	51(25.5)	39(19.5)
Our profession has a responsibility to treat people infected with hepatitis C	69(3.0)	24(12.0)	59(29.5)	111(55.5)
I prefer an exciting, unpredictable life	20(10.0)	143(71.5)	20(10.0)	17(8.5)
I try to avoid looking after patients infected with hepatitis	32(16.0)	120(60.0)	32(16.0)	16(8.0)
My risk of becoming infected with hepatitis C through my work is low	14(7.0)	30(15.0)	146(73.0)	10(5.0)
It is not necessary for patients to undergo mandatory testing for hepatitis C upon admission to the hospital	17(8.5)	137(68.5)	24(12.0)	22(11.0)
Patients undergoing surgery should be tested for Hepatitis C to protect the staff looking after them	4(2.0)	16(8.0)	71(35.5)	109(54.5)
I enjoy taking risks in life	61(30.5)	105(52.5)	24(12.0)	10(5.0)
Patients who know that they have hepatitis C should disclose their infectious status to the people caring for them	19(9.5)	36(18.0)	128(64.0)	17(8.5)
I use standard precautions to protect myself whenever I suspect, I might be exposed to body fluids	8(4.0)	2(10.0)	135(67.5)	37(18.5)
The way the patient caught hepatitis C influences the way I treat him/her	28(14.0)	144(72.0)	21(10.5)	7(3.5)
When looking after a patient with Hep C, I try to spend as little time with them as possible	9(4.5)	32(16.0)	141(70.5)	18(9.0)
If I know someone has hepatitis C, I treat them differently from other patients	16(8.0)	49(24.5)	97(48.5)	38(19.0)
I have no problem looking after someone with Hep-C, regardless of how they caught the disease	14(7.0)	56(28.0)	110(55.0)	20(10.0)
Touching someone infected with Hep C doesn't make me uncomfortable	37(18.5)	45(22.5)	92(46.0)	26(13.0)
I can't always follow standard precautions because my patient's needs come first	16(8.0)	21(10.5)	144(72.0)	19(9.5)
The infection control guidelines necessary to treat patients with hepatitis C would be a financial burden on my practice /ward	17(8.5)	97(48.5)	70(35.0)	16(8.0)

Average Knowledge scores distribution of the respondents

Table 4 shows average knowledge scores of the study participants regarding the general knowledge of hepatitis C. Almost two-thirds (65.2%) of the study participants had a satisfactory level of knowledge, and only 35.7% had a poor level of attitude regarding hepatitis C.

Score	General Knowledge on Hep-C (%)	Knowledge on routes of transmission of Hep-C	Knowledge on ways of preventing Hep-C infection	Knowledge of measures taken to protect against Hep-C infection	Level of attitudes regarding Hep-C	Average overall knowledge
Correct (Yes)	65.2	69.8	66.4	64.5	64.3	66.0
Incorrect (No)	34.8	30.2	33.6	35.5	35.7	34.0
Total	100	100	100	100	100	

Key to the scores

Excellent	90-100%
Very Good	80-89%
Good	70-79%
Satisfactory	50-69%
Poor	0-49%

Associations between socio-demographic factors and other variables

Table 5 shows the relationship between socio-demographic factors and certain variables. It reveals that age is significantly related to the likelihood of avoiding caring for patients with hepatitis ($P=0.002$). However, there is no significant link between educational qualification and the knowledge that Hepatitis C is transmitted like HIV/AIDS ($P=0.345$). On the other hand, there is a significant association between the respondents' educational qualifications and their understanding that hepatitis is caused by a virus ($P=0.000$).

Table 5: Associations between Socio-Demographic Factors and Other Variables (N=200)

Age group	I try to avoid looking after patients infected with hepatitis					Statistics
	Strongly Agree	Not Agree	Agree	Agree Strongly	Total	
≤22	1	7	3	6	17	$X^2=26.17$ $P=0.002$
23-33	19	66	17	7	109	
34-44	6	38	8	1	53	
45-55	6	9	4	2	21	

Professional status	Hepatitis C is also widely transmitted, like HIV/AIDS		Total	
	True	False		
Diploma in nursing	52	24	76	X ² =4.48 P=0.345
B.Sc. in nursing	37	19	56	
M.Sc. in nursing	18	4	22	
MPH	26	9	35	
Others	10	1	11	
Professional status	Hepatitis is caused by virus		Total	
	True	False		
Diploma in nursing	54	22	76	X ² =46.49 P<0.001
B.Sc. in nursing	54	2	56	
M.Sc. in nursing	22	0	22	
MPH	35	0	35	
Others	4	7	11	

Discussion

The hepatitis C virus (HCV) is a blood-borne disease that attacks the liver. Most people do not know they are infected due to an absence of symptoms in the initial stages of the disease. In the present study, the mean age of the study participants was 31.81 years. Slightly above half of the study participants (54.5%) were in the age group 23-33 years. Seventy-five percent of the study participants were females. This is similar to the findings of another study conducted in Macedonia (Prodanovska et al. 2010). According to the general knowledge on hepatitis C, three-fourths of the study participants mentioned that hepatitis can lead to cirrhosis only 24.0% of the study participants did not agree that hepatitis C is associated with increased risk of liver cancer. Another study reported that half of the personnel indicated that cirrhosis was caused by hepatitis C, and 37.0% thought it caused liver cancer (Nicklin et al. 1999). Regarding routes of transmission of hepatitis C, four-fifths of the study participants agreed that it can be transmitted through needles and sharps. This is in line with another finding of a study conducted in Kuwait, which reported that the majority of the participants were aware that blood and blood products, sharps and needles were the main routes of transmission (Alkandari et al. 2013). Twenty-six percent of the study participants did not agree that HCV can be transmitted through sexual intercourse. Nonetheless, 70.0% stated that it can be transmitted through close personal contact. Studies done by D'souza et al in 2004 and Van de Mortel in 2002 reported that most of the study participants indicated that blood transfusion is a major mode of transmission. According to measures taken to protect against hepatitis C infection; 65.5% of the study participants believed that it can be protected through wearing gloves, adequate disposal of sharps (26.5%), and by multivitamin/blood tonic (31.5%). In a study conducted by Askarian et al. in 2011, he stated that appropriate hand washing and use of obstacles such as masks, gloves and gowns are the major components of standard precautions that can diminish mucocutaneous exposures. This is consistent with the finding of a study, which reported that HCWs are at an increased risk of blood borne diseases (Wang, 2007). Based on attitudes regarding hepatitis C; close to 3.0% of the study participants were strongly agreed that their profession has a responsibility to treat people infected with hepatitis C, only 15.7% of the study participants agreed to try to avoid looking after patient infected with hepatitis, 34.8% agreed strongly that all patients undergoing surgery should be tested for hepatitis C to protect the staff looking after them. In our study, 64.3% of study participants had a satisfactory level of attitude regarding

hepatitis C. This result is inconsistent with the finding of another study, which reported that more than half of the study participants had a negative attitude towards hepatitis C (Hassan et al. 2011). Most of our study participants had a satisfactory level of knowledge (66.0%). This goes in line with another study, which found that the mean knowledge level score was acceptable (Joukar et al. 2011). Our result is similar to the result of another study, which found that the mean knowledge level of the respondents was relatively low toward HCV infection (Mansour-Ghanaei et al. 2009).

Conclusion

This study found that participants had a good understanding of general knowledge about Hepatitis C and held positive attitudes toward the infection. The results showed a significant link between the participants' level of education and their knowledge that Hepatitis C is caused by a virus. Based on these findings, it is recommended that continuous education programs be implemented to raise awareness about Hepatitis C, especially in different risk groups. Increasing education on the disease, its prevention, management, and infection control will help nurses and health workers better care for patients with Hepatitis C and reduce negative attitudes toward them. It is also suggested that further research with a larger, more diverse group of participants from different regions could provide more comprehensive insights into nurses' knowledge of Hepatitis C.

Conflict of Interest

The authors declare that they have no competing interests.

Abbreviations: AIDS

Acquired Immune Deficiency Syndrome, HCV: Hepatitis C Virus, HIV: Human Immunodeficiency Virus, MPH: Master of Public Health, NICVD: National Institute of Cardiovascular Diseases, SPSS: Statistical Package for the Social Sciences, WHO: World Health Organization.

Author's contribution

SH designed the study and developed the questionnaire. ABMAC supervised the data collection and the entire process. FM analyzed the data and prepared the first draft of the manuscript. MGDH and MIH contributed to the interpretation of the findings. MH and MC contributed to the development of the overall study concept and the drafting of the paper. All authors read and approved the final manuscript.

References

- Akbar, S. M. F., Hossain, M., Hossain, M. F., Sarker, S., Hossain, S. A. S., Tanimoto, K., Masumoto, T., Michitaka, K., Horiike, N., & Onji, M. (1997). Sero-epidemiology of hepatitis viruses of chronic liver diseases in Bangladesh: High prevalence of HCV among blood donors and healthy persons. *Hepatology Research*, 7, 113–120.
- Alkandari, A., Aljodarb, S., Albahhouh, H. A., Makboul, G., & El-Shazly, M. (2013). Knowledge, attitudes, and self-reported behavior of primary health care workers for hepatitis B and C virus and other health care-associated infections. *Greener Journal of Medical Sciences*, 3(1), 18–31.
- Askarian, M., Yadollahi, M., Kouchak, F., Danaei, M., Vakili, V., & Momeni, M. (2011).

Precautions for health care workers to avoid hepatitis B and C virus infection. *International Journal of Occupational and Environmental Medicine*, 2(4), 12.

Basal, A., Kamel, E., & Nafady, H. (2011). Studying the quality of life of chronic hepatitis C patients and the associated factors. *Journal of American Science*, 7(12), 649–655.

D'Souza, R. F., Glynn, M. J., Alstead, E., Osonayo, C., & Foster, G. R. (2004). Knowledge of chronic hepatitis C among East London primary care physicians following the Department of Health's educational campaign. *QJM*, 97, 331–336.

European Association for the Study of the Liver. (2011). EASL clinical practice guidelines: Management of hepatitis C virus infection. *Journal of Hepatology*, 55, 245–264.

Ghahramani, F., & Mohammad Beigi, A. (2006). Survey of the students' knowledge about hepatitis. *Hepatitis Monthly*, 6(2), 59–62.

Hassan, S. G., El-Ghitany, M. E., & El-Sheikh, W. (2011). Knowledge, attitude, and lifestyle changes among chronic hepatitis C patients in Alexandria, Egypt: An ear-appeal intervention. *Journal of American Science*, 8(2), 73–79.

Joukar, F., Mansour-Ghanaei, F., Soati, F., & Meskinkhoda, P. (2011). Knowledge levels and attitudes of health care professionals toward patients with hepatitis C infection. *World Journal of Gastroenterology*, 18(18), 2238–2244.

Khan, M., Ahmed, N., Rabtuan, S., Zaki, K. M. J., & Matin, M. A. (1995). Interferon therapy in chronic viral hepatitis in Bangladesh: A preliminary report. *International Hepatology Communications*, 3(Suppl), 104.

Khan, M., Husain, M., Yano, M., Hashizume, K., Yousuf, M., Tanaka, E., Matsumoto, A., Furuta, S., & Kiyosawa, K. (1993). Comparison of sero-epidemiology of hepatitis C in blood donors between Bangladesh and Japan. *Journal of Gastroenterology*, 28(5), 28–31.

Mansour-Ghanaei, R., Joukar, F., Souti, F., & Atrkar-Roushan. (2009). Knowledge and attitude of medical science students toward hepatitis B and C infections. *International Journal of Clinical and Experimental*, 6(3), 197–205.

Nicklin, D. E., Schultz, C., Brensinger, C. M., & Wilson, J. P. (1999). Current care of hepatitis C-positive patients by primary care physicians in an integrated delivery system. *Journal of the American Board of Family Practice*, 12(6), 427–435.

Prodanovska-Stojčevska, V., Isjanovska, R., & Popova-Ramova, E. (2010). Knowledge of HCV infection among nursing students of the Medical College of Bitola. *Arhiv za Higijenu Rada i Toksikologiju*, 61, 197–201.

Tiftikci, A. O., Atug, A., & Tozun, N. (2009). Awareness of hepatitis C virus transmission routes among patients, their household contacts, and health care staff: Does perception match the reality? *Turkish Journal of Gastroenterology*, 20(2), 104–107.

Van de Mortel, T. F. (2002). Health care workers' knowledge and attitudes toward hepatitis C patients with hepatitis C: A pilot study. *Australian Journal of Advanced Nursing*, 20(1), 13–19.

Wands, J. R. (2004). Prevention of hepatocellular carcinoma. *New England Journal of*

Medicine, 351, 1567–1570.

Wang, S. (2007, July 23). Hepatitis B study takes a new approach to health: Questionnaire developed to use a patient's quality of life as a part of treatment. *Daily Bruin Newspaper*.

Yaghi, S. A., Btihal Al-Habib, E. S., Sadik, A. A., Almutairi, G. R., Makboul, G., & El-Shazly, M. K. (2010). Knowledge, attitude, and behavior of primary health care workers about hepatitis C, Kuwait. *Greener Journal of Medical Sciences*, 2(4), 84–91.