KNOWLEDGE AND ATTITUDE OF HEALTH CARE WORKERS TOWARD PATIENTS WITH HEPATITIS C INFECTION

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Abstract. This study aimed to evaluate the level of knowledge of healthcare workers in Kutahya (a western province of Turkey) about HCV infection and their attitudes toward patients with hepatitis C infection. A total of 335 healthcare workers working in Kutahya Evliya Celebi Research and Training Hospital were included in the study. A questionnaire evaluating demographic characteristics, level of knowledge and attitudes of healthcare workers toward patients with hepatitis C infection was administered to the participants. Thirty-six point four percent of the participants were males. According to the occupations, distributions of the participants were as followings: 54.6% nurse, 25.1% physician, 11.6% trainee nurse, 4.5% intern and 4.2% anesthesia technician. The mean age of healthcare professionals was 30.32±8.10 years. Fifty-eight point eight percent of them experienced percutaneous injury. The mean knowledge score was 18.05±3.01 (from a total of 25). There was a statistically significant relationship between knowledge score and age, working year, occupational group (p<0.001). There was also a significant relationship between total attitude score and gender (p=0.006), age (p=0.002), working year (p=0.021) and occupational group (p<0.001). It was determined that as total knowledge score of the participants increased they exhibited a more positive attitude toward patients with hepatitis C infection (p<0.001). A positive relationship was determined between the level of knowledge of healthcare workers and positive attitudes toward patients with hepatitis C infection. Therefore, increasing the level of knowledge is necessary for more positive attitudes.

Keywords: healthcare workers, hepatitis C, knowledge, attitude, occupational exposure

INTRODUCTION

Hepatitis C virus (HCV) infection is an important health problem since it affects all countries and chronic hepatitis C may cause cirrhosis and hepatocellular carcinoma (HCC) (Lavanchy, 2011; European Association for the Study of the Liver, 2015). According to WHO, 2.8% of the world's population is infected with hepatitis C virus (WHO Europe, 2012). In a study performed in Turkey between the years 2008-to-2011 throughout the country by the Turkish Liver Research

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Association, the anti-HCV positivity rate was found to be 0.95% in 5,471 individuals (Tosun, 2013).

Health-care workers are facing viruses like hepatitis B, hepatitis C and human immunodeficiency virus (HIV) since they are contact with blood and blood fluids (Beltrami *et al*, 2000). Occupational exposures to percutaneous injuries are substantial source of infections with blood-borne pathogens (Prüss-Ustün *et al*, 2005). Worldwide, approximately 40% of hepatitis B and hepatitis C infections developing in health care workers result from percutaneous injuries (WHO, 2002). In a study conducted by Hosoglu *et al* (2009), with a total of 5,258 health care workers in Turkey, 50.1% of health care workers reported that they had exposure to percutaneous sharps injuries at least once in the previous year. Again in the same study, the groups with the highest risk of percutaneous sharps injuries were reported to be physicians and nurses (Hosoglu *et al*, 2009).

Social relations of the HCV-infected individuals are affected considerably with diagnosis of hepatitis C. Therefore, hepatitis C should be not be considered as a disease affecting only the liver but also a disease that affects mood, family and social life of the individual. The feeling of stigmatization in hepatitis C carriers may cause anxiety and isolate them from the society (Marinho and Barreira, 2013). This condition may affect the quality of life of the individuals with hepatitis C (Butt, 2008). While discrimination against people living with hepatitis C virus is seen in many settings, it is most commonly encountered in health care settings (Richmond *et al*, 2007).

Due to higher risk of transmission with hepatitis C, health care workers may be discriminatory and may exhibit negative attitudes toward these patients. It is important to determine and prevent the deficiencies causing discrimination for prevention of discrimination among health care workers. In the studies performed, knowledge level about hepatitis C was found to be related with positive attitudes toward these patients (Joukar *et al*, 2012, Mansour-Ghanaei *et al*, 2013). However, in another study performed, it was observed that some health care workers might exhibit negative attitudes toward these patients despite sufficient knowledge level (Richmond *et al,* 2007).

There are limited numbers of studies that may include different results regarding evaluation of attitudes of health care workers toward the patients with hepatitis C. To the best of our knowledge, although there are studies investigating knowledge level of health care workers in our country, there is no study evaluating attitudes, willingness to treat, and fears of health care workers. If the factors affecting the attitudes of health care workers toward the patients with hepatitis C can be evaluated in our country, it may be possible to prevent these negative attitudes toward these patients and enable them to get better health care service. However, if the factors causing negative attitudes can be evaluated, this may also enable health care workers to feel more confident and more comfortable during providing health care to the patients with hepatitis C.

In this study, it was aimed to evaluate the factors causing negative attitudes of health care workers and consequently to contribute to provision of better health care to the patients with hepatitis C.

MATERIALS AND METHODS

Study population

Health care workers who serve in Kutahya Evliya Celebi Training and Research

Hospital between July 22 and August 22, 2015 were included in the study.

Ethical considerations

The Dumlupinar University Clinical Research Ethics Committee approved this study (Ref Nº 2015-KAEK-86/08-36). Written informed consents of all participants (physician, nurse, anesthetic technician, trainee nurse and intern) who agreed to participate in the study were taken after being informed about study protocol in detail.

Questionnaire

While preparing the questionnaire used in our study, survey questions used in the study performed previously by Richmond *et al* (2007) and assessing the level of knowledge and attitudes of health care workers regarding the patients with hepatitis C. Our questionnaire was prepared also by adding the questions from the relevant similar studies performed previously (Van de Mortel *et al*, 2002; Mansour-Ghanaei *et al*, 2013). The questionnaire prepared was translated into Turkish.

Forty-seven questions including the following were asked to the participants: 4 questions related to age, gender, occupation, working years; 25 questions related to the knowledge about HCV infection; 10 questions related to description of attitude toward the patients with hepatitis C virus; 2 questions related to attitude and willingness to treat the patients with hepatitis C; 2 questions related to attitudes and the fears about contact with HCV; 4 questions including history of sharp object injury, training about hepatitis C, the source of knowledge and whether the respondent finds the level of knowledge sufficient or not.

The level of knowledge of healthcare workers was evaluated with correct responses to total 25 questions given to them. During evaluation of the level of knowledge in our study, the mean knowledge score was used for discrimination (Joukar *et al*, 2012). Scores over the mean knowledge score were defined to be good knowledge level and the scores below the mean knowledge score were defined to be poor.

A Likert scale was used in the questionnaire to evaluate the attitudes of health care workers toward the patients with hepatitis C. Attitudes were evaluated by asking 10 questions. In the description of positive and negative attitudes, the scores ≤30 were defined to be negative and the scores >30 were defined to be positive attitude (Joukar *et al*, 2012) (Table 1).

Statistical analysis

SPSS® (version 22.0; IBM, Armonk, NY) was used for the statistical analysis. The calculation of frequency and percentages for the classified data, mean, and standard deviations were obtained. While statistical differences between the classes were done with chi-square test, and mean differences between the groups were investigated by using Mann-Whitney *U* test and Kruskal-Wallis tests. Differences with a significant level of 5% were investigated.

RESULTS

Sixty-three point six percent of health care workers participated in the study were females, and the mean age was 30.32±8.10 years. Demographic characteristics of health care workers participated in the study were given in Table 2. The mean knowledge score of health care workers was 18.05±3.05. Ninety-four point nine percent of the participants answered the question of hepatitis C was caused by a virus correctly; 99.7% of them knew that hepatitis C virus could be spread through

Table 1
Questions in the questionnaire for Hepatitis C.

Hepatitis C knowledge questions (response options: true, false and uncertain)

1. Hepatitis C is caused by a virus.
2. Hepatitis C can be spread through close personal contact (*eg*, handshaking, kissing).
3. Hepatitis C can be spread by mosquitoes.
4. Hepatitis C can be spread through sharing injecting equipment, such as surgery materials.
5. Hepatitis C can be spread from mother to baby during delivery.
6. Some people are infected with hepatitis C after blood transfusions.
7. Sexual transmission is a common way in hepatitis C transmission.
8. A medical and/or dental procedure performed increases a person's chances of contracting hepatitis C.
9. Sharp object injury such as syringe or suture material is a condition at highest risk for transmission of hepatitis C for health care workers.
10. People with hepatitis C should be restricted from working in the food industry.
11. Some people are infected with hepatitis C through unsterile tattooing.
12. Hepatitis C virus can be transmitted through endoscopy and colonoscopy equipment.
13. Transmission may occur from a hepatitis C positive individual to the other family members.
14. Hepatitis C can be spread through sharing dishes of the patients with hepatitis C.
15. Hepatitis C can lead to cirrhosis.
16. Hepatitis C is a mutation of hepatitis B virus.
17. Hepatitis C is associated with an increased risk of liver cancer.
18. A person infected with hepatitis C may not have any symptoms of the disease.
19. Symptoms of the disease are observed immediately after the entrance of hepatitis C virus into the body.
20. The risk for transmission of hepatitis C through needle stick injury is 30-50%.
21. There is a vaccine for hepatitis C.
22. Hepatitis C is screened in the tests performed before marriage.
23. There is an efficient prophylactic treatment for the injury through a syringe of a patient with hepatitis C.
24. There is a pharmaceutical treatment available for hepatitis C.
25. People with hepatitis C should restrict their alcohol intake.

Attitudes and self-reported behavior (response options: strongly agree, agree, uncertain, disagree, and strongly disagree)

1. All patients should be tested for HCV before they receive health care.
2. Patients with HCV should be given the last appointment for the day.
3. Health care professionals who are HCV positive should be discouraged from having contact with patients.
4. I deliver the same standard of care to patients with HCV as I do for other patients.
5. I pay attention not to spend time during care for the patients with hepatitis C.
6. I feel that I do not have the skills needed to effectively and safely treat patients with HCV.
7. I would prefer to wear two pairs of gloves when treating a bleeding hepatitis C-positive patient.
8. I often use additional infection control precautions when treating patients with HCV.
9. Following infection control guidelines will protect me from being infected with hepatitis C at work.
10. My possibility of being infected with hepatitis C is low while working at hospital.

Attitudes and self-reported willingness to treat people with hepatitis C

I do not like treating people with HCV.
I am willing to treat people with HCV.

Attitude and self-reported fear of contracting hepatitis C

I am afraid of catching hepatitis C infection.
I am afraid I might have hepatitis C infection.

Table 2
Demographic data of health care workers.

Variable	*n* (%)
Gender	
Men	122 (36.4)
Women	213 (63.6)
Sharp object injury	
Present	197 (58.8)
Absent	138 (41.2)
Occupation	
Physician	84 (25.1)
Nurse	183 (54.6)
Anesthetic technician	14 (4.2)
Trainee nurse	39 (11.6)
Intern	15 (4.5)
Education about hepatitis C	
Present	290 (86.6)
Absent	21 (6.3)
Do not remember	24 (7.1)
Working year (*n*=281)	
≤ 5	99 (35.2)
6-10	72 (25.6)
≥ 11	110 (39.2)
Educational resources (*n*=332)	
Lecture notes	170 (51.2)
Conference and lecture notes	64 (19.3)
Internet and newspaper	32 (9.6)
Conference	25 (7.5)
Other	41 (12.4)
Age (years)	
≤ 30	176 (52.5)
31-40	135 (40.3)
≥ 41 years	24 (7.2)
Adequate knowledge about hepatitis C	
Present	93 (27.8)
Absent	127 (37.9)
Not sure	115 (34.3)

sharing injection materials such as needles and surgical equipment. Ninety-two point five percent of them knew that hepatitis C virus could be contracted through non-sterile tattoos; 82.0% of them knew that it could be spread through endoscopy and colonoscopy equipment, and 95.2% of them knew that blood transfusion was a method of transmission correctly.

However, some deficiencies were found in knowledge levels of health care workers. Fifty-three point nine percent of health care workers thought that hepatitis C virus can spread through mosquitoes, and 68.6% of them considered that sexual transmission of hepatitis C virus is more common. Forty-eight point six percent of them felt that working of the individuals with HCV should be limited in the food sector. The rate of health care workers believing that there is prophylactic treatment against hepatitis C virus was 39.5%.

Forty-eight point three percent of them knew that there was an efficient treatment against hepatitis C virus; 41.0% did not know, and 10.6% stated that they had no knowledge about treatment. The mean knowledge score of males was 18.60±2.57, when it was evaluated according to the occupation; the mean knowledge score of physicians was 20.30±2.06. Physicians are the most knowledgeable professional group and when it is compared with the other professional groups, the difference is statistically significant (p<0.001). The mean knowledge score is significantly greater in the individuals with greater experience and older age (p<0.001) (Table 3).

Total scores of knowledge higher than 18.05 were determined to be a good knowledge level and total scores of knowledge lower than 18.05 to be a poor knowledge level. Older age and working year, being a physician was statistically significant for having a good knowledge level (p<0.001).

Mean behavior score of health care workers participating in the study is 27.27±4.59. One hundred and fifty-nine health care workers (54.3%) showed negative attitudes (score: 10-30) and 153 health care workers (45.7%) showed positive

Table 3
Association of knowledge levels of health care workers about hepatitis C with different variables.

Variables	Mean knowledge score	*p*-value
Age (years)		
≤30	17.3 ± 2.95	<0.001
31-40	18.88 ± 2.77	
≥41	19.46 ± 2.15	
Occupation		
Physician	20.30 ± 2.06	<0.001
Nurse	17.36 ± 2.97	
Anesthetic technician	18.95 ± 2.41	
Trainee nurse	16.49 ± 3.46	
Intern	18.00 ± 2.48	
Gender		
Female	18.60 ± 2.57	0.365
Male	18.07 ± 3.09	
Sharp object injury		
Present	18.01 ± 2.87	0.090
Absent	18.74 ± 2.93	
Interval of working years		
≤5	17.17 ± 3.07	<0.001
6-10	18.69 ± 2.97	
≥11	18.95 ± 2.41	
Training about hepatitis C		
Present	18.39 ± 2.92	0.079
Absent	17.25 ± 2.77	
Do not remember	17.71 ± 2.74	

attitudes (score: 31-50). Older age, male gender and being physician were found to be statistically significant for positive attitude ($p<0.05$) (Table 4).

There was a positive correlation between total scores of knowledge and behavior score ($p<0.001$). Eighty-one point five percent of health care workers stated that they believed test for hepatitis C should be performed in all patients before health care service, 84.3% of them stated that they took additional infection control precautions during treatment of the patients with hepatitis C infection. About two-thirds (69.6%) of them expressed that they preferred wearing two pairs of gloves during treatment of bleeding of the patient known to be hepatitis C, and the same percentage believed that the patients with hepatitis C should be given the last appointment of the day.

While 28.4% of health care workers stated that they agreed with the opinion of disliking to treat the patients with hepatitis C, 21.5% of them expressed they had no idea, and 50.1% of them reported that they did not agree with this opinion. Eighty point six percent stated that they were afraid of catching hepatitis C infection; 46.3% expressed they were afraid

Table 4
Association of attitudes of health care workers with different variables.

Variables	Negative attitude *n* (%)	Positive attitude *n* (%)	*p*-value
Age (Years)			
≤30	108 (61.36)	68 (38.64)	0.025
31-40	63 (46.67)	72 (53.33)	
≥41	11 (45.83)	13 (54.17)	
Occupation			
Physician	24 (28.57)	60 (71.43)	<0.001
Nurse	111 (60.66)	72 (39.34)	
Anesthetic technician	10 (71.43)	4 (28.57)	
Trainee nurse	30 (76.92)	9 (23.08)	
Intern	7 (46.67)	8 (53.33)	
Gender			
Female	132 (54.33)	81 (45.67)	<0.001
Male	50 (40.98)	72 (59.02)	
Sharp object injury			
Present	116 (58.88)	81 (41.12)	0.058
Absent	66 (47.83)	72 (52.17)	
Interval of working years			
≤5	59 (59.60)	40 (40.40)	0.127
6-10	36 (50)	36 (50)	
≥11	50 (45.45)	60 (54.55)	
Training about hepatitis C			
Present	157 (54.14)	133 (45.86)	0.909
Absent	11 (52.38)	10 (47.62)	
Do not remember	14 (58.33)	10 (41.67)	

of having hepatitis C infection in them. Only 35.2% reported that they would be willing to treat patients with hepatitis C infection. The knowledge score of the group stating that they disliked treating patients with hepatitis C was significantly lower (p=0.040). Again, the positive attitude proportion of the group disliking to treat the patients with hepatitis C was significantly lower (p=0.001).

DISCUSSION

The mean knowledge level of health care workers about hepatitis C infection was 18.05±3.05, and it was acceptable. The knowledge level was higher than the mean in approximately half of the health care workers, and it was considered to be a good knowledge level. Similarly, the mean knowledge level in two other studies were 17.5±3.5 (Richmond *et al*, 2007) and 17.43±2.65 (Joukar *et al*, 2012).

In our study, physicians were determined to be the most knowledgeable group. The results were similar to the other studies (Van de Mortel, 2002; Richmond *et al*, 2007, Joukar *et al*, 2012). Good knowledge level of physicians about hepatitis C may result from having a detailed training about this subject.

Health care workers who were older than 41 years of age and who had greater experience were more knowledgeable, similar to other studies which found that the 30-49-year age group was the group with higher knowledge level (Richmond *et al*, 2007, Joukar *et al*, 2012) while Islam *et al* (2014) found the 35-45 year age group was more knowledgeable about hepatitis C infection. This suggests that experience increasing with age may also have an impact on the level of knowledge.

Although gender was assessed to be independent from level of knowledge in some other studies (Van de Mortel 2002; Brailo *et al*, 2011; Cekin *et al*, 2013; Mansour-Ghanaei *et al*, 2013), in our study, male health care workers have better knowledge level compared to female health care workers.

Health care workers gave correct answers to the questions related to modes of transmission of hepatitis C with high rate. However, 68.6% of health care workers consider that sexual transmission of hepatitis C virus is a common way. Also in other studies, it was reported that health care workers thought that sexual transmission was a common way in transmission of hepatitis C (Van de Mortel, 2002; Richmond *et al*, 2007; Joukar *et al*, 2012).

Despite recent advances in hepatitis C treatment and a higher level of sustained virological response obtained with treatment only, 48.3% of our health care workers (data not showed) know that there is an efficient treatment for hepatitis C. In similar studies some deficits were identified in knowledge level of health care workers about possibility of treatment for hepatitis C (Van de Mortel, 2002; Richmond *et al*, 2007).

Consideration of hepatitis C is substantially untreatable by health care workers may negatively affect their attitudes toward the patients with hepatitis C. Therefore, updating the knowledge regarding treatment and prophylaxis of blood borne diseases in the postgraduate trainings related to protection from blood borne diseases given to health care workers is of vital importance in prevention of discrimination against the patients with hepatitis C. The median behavior score in our study was 27.

Physicians were the most positive group towards patients with hepatitis C. Due to presence of a positive correlation between positive attitudes and higher levels of knowledge, physicians who were the most knowledgeable group had also the most positive attitude scores. Similarly, a positive correlation was seen between level of knowledge and attitude score in the other studies (Vitale *et al*, 2005; Richmond *et al*, 2007; Razi *et al*, 2010; Joukar *et al*, 2012; Bianco *et al*, 2013).

In a study investigating the factors affecting behavior of medical science students toward the patients with hepatitis B and C infection, gender, family history of hepatitis, and level of knowledge were found to be correlated with behavior score (Mansour-Ghanaei *et al*, 2013). In a study performed with dental students, a significant correlation was found between level of knowledge and positive attitude and also level of knowledge was determined to be significantly different between senior and junior students (Brailo *et al*, 2011).

About two-thirds (69.6%) of health care workers (data not showed) stated they believed that the patients with hepatitis C should be given the last appointment of the day. Other studies found lower results; whereby, rates were 30% (Ricmond *et al*, 2007), 48.5% (Joukar *et al*, 2012), and 29.2% (Mansour-Ghanaei *et al*, 2013).

Statements by health care workers in our study that they want the patients with hepatitis C to be given the last appointment of the day and use additional infection control precautions with higher rate during the contact with these patients suggest that they believe standard precautions are insufficient to prevent the transmission from the patients with hepatitis C to the other patients.

When level of knowledge of health care workers dislike to treat the patients with hepatitis C was evaluated, and it was observed that their knowledge levels were significantly lower. However, in our study no significant correlation was determined between willingness to treat these patients and knowledge level. Same as in some of the studies a significant correlation was not found between level of knowledge and willingness to treat the patients with hepatitis C; however, in some of the studies level of knowledge of health care workers who had willingness to treat these patients was determined to be higher (Van de Mortel, 2002; Richmond *et al*, 2007; Brailo *et al*, 2011; Joukar *et al*, 2012).

In our study, no significant correlation was determined between fear of contracting hepatitis C and level of knowledge of health care workers. This also shows us that some personal factors and lack of knowledge about the rate of transmission and treatment of hepatitis C might be caused to this condition.

Additional infection control precautions during the care for the patients with hepatitis C, and believing that standard precautions are insufficient to prevent the transmission from patient to patient and from patients to health care workers, which would put health workers at higher risk could play an important role in this fear.

It was observed that more positive attitudes of health care workers toward the patients with hepatitis C virus was affected directly by levels of knowledge, clinical experience, and older age of respondents. We believe that increasing the quality of training about hepatitis C and emphasizing the efficiency of standard infection control precautions for preventing transmission of hepatitis C in clinical practice may have an important role about health care workers feeling themselves confident during care for the patients with hepatitis C, preventing fear of contracting hepatitis C and increasing willingness to treat these patient.

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