

# Attitudes and Awareness Regarding Hepatitis B and Hepatitis C Amongst Health-care Workers of a Tertiary Hospital in India

Setia S, Gambhir RS, Kapoor V<sup>1</sup>, Jindal G<sup>1</sup>, Garg S<sup>1</sup>, Setia S<sup>2</sup>

Department of Public Health Dentistry, Gian Sagar Dental College and Hospital, <sup>1</sup>Department of Oral Surgery, Gian Sagar Dental College and Hospital, Rajpura, Punjab, <sup>2</sup>Department of Radiology, Government Multispeciality Hospital, Chandigarh, India

## Address for correspondence:

Dr. Ramandeep Singh Gambhir,  
Gian Sagar Dental College, Rajpura,  
Punjab - 140 601, India.  
E-mail: ramang@yahoo.co.in

## Abstract

**Background:** Hepatitis is an inflammatory disease of the liver. In sever cases, it may lead to permanent liver damage including liver cirrhosis or hepato-cellular carcinoma and may ultimately lead to death. Health-care workers (HCWs), due to their regular contact with patients are at a high-risk of acquiring this disease. **Aim:** The aim of this study was to assess the knowledge and attitude toward hepatitis B and C infection among the health-care interns and correlate the level of awareness to the attitude they behold toward the disease. **Subjects and Methods:** A closed ended questionnaire consisting of questions to evaluate the knowledge regarding hepatitis B and C infection and attitude of the (HCWs/interns) was duly filled by 255 participants including, 100 dental, 100 medical, and 55 nursing interns. Statistical analysis was carried out using the Chi-square test, ANOVA test, *post-hoc* test and Pearson's correlation. **Results:** Although most of the interns were aware of the existence of hepatitis B and C infection, the level of awareness regarding the modes of transmission and vaccination was found to be dissatisfactory. Awareness level regarding the infection among nursing interns was statistically significantly lower than the dental and medical interns. A direct positive correlation as found between awareness score and behavior score, which reveals that interns with better awareness level had better attitudes toward the infection and prevention of its transmission. **Conclusion:** There is an urgent need to increase the level and quality of training among HCWs to prevent the spread of hepatitis B virus and hepatitis C virus.

**Keywords:** Attitude, Health-care workers, Hepatitis B, Hepatitis C, Interns, Knowledge

## Introduction

Hepatitis is characterized by the inflammation of liver and in many cases hepatitis B and C can lead to permanent liver damage including liver cirrhosis or hepatocellular carcinoma and even death.<sup>[1]</sup> In South-East Asian Region, there are estimated 80 million hepatitis B virus (HBV) carriers (about 6% of the total population).<sup>[2]</sup> India has the intermediate endemicity of hepatitis B, with hepatitis B surface antigen prevalence between 2% and 10% among the population

studied.<sup>[3]</sup> The number of carriers in India has been estimated to be over 40 million.<sup>[3]</sup> The true prevalence of hepatitis B in non-tribal populations is 2.4% tribal populations is 15.9% as per recent data.<sup>[4]</sup> Alarmingly two studies specifically, looking at professional donors have noted prevalence of 55.3% and 87.3% for hepatitis C.<sup>[5,6]</sup> It has been estimated that 14.4% and 1.4% of hospital workers are infected with HBV and hepatitis C virus (HCV), respectively.<sup>[7]</sup> Physicians, dentists, nurses, laboratory staff, and chair side assistants are at high-risk of acquiring infection via the contact with blood (and other body fluids) in the course of their work.<sup>[8]</sup> Among the health care personals', HBV, and HCV is transmitted by the skin prick with an infected, contaminated needles and syringes or through accidental inoculation of minute quantities of blood during the surgical and dental procedures. It has been seen in the literature that the highest prevalence of HBV exists in dentists.<sup>[9]</sup> HBV can be prevented by strict adherence to standard microbiological

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practices and techniques, and routine use of appropriate barrier precautions to prevent skin and mucous membrane exposure when handling blood and other body fluids of all patients in health-care settings and pre-exposure vaccines. Even after many publications about programs and strategies to prevent transmission, HBV, and HCV infections still remains a major public health issue for mankind.<sup>[10]</sup>

It has been recommended that prevention is a safeguard against epidemic of viral hepatitis. By knowing facts, having proper awareness, and attitudes the menace of this disease can be prevented to a great extent.<sup>[11]</sup> As health-care workers (HCWs) remain at a high-risk of transmission by skin prick with infected, contaminated needles and syringes or through accidental inoculation of minute quantities of blood during the surgical and dental procedures it is very important for them to follow proper measures of infection control and prevention.

Patients with hepatitis C may sometimes experience discrimination and stigmatization in the work place, by family members and by members of their communities. In addition, they may face discrimination from health-care professionals.<sup>[12,13]</sup> These discriminatory practices may be a result of lack of knowledge, which may lead to negative attitudes toward these kinds of diseases, which could interfere with their willingness to treat these patients because of a fear of contracting the infection.

Knowledge and attitudes of the clinician play a key role in prevention of spread of infection. Therefore, the objectives of the present study were to assess knowledge, attitudes and practices of HCWs including, dental interns, medical interns, and nursing interns regarding hepatitis B and C and to compare their knowledge and behavior/attitude score between different health-care groups. Another important objective of the study was to correlate the awareness regarding hepatitis B and C infection to the clinical attitudes and behavior regarding this disease in order to estimate how attitude and behavior can be influenced by education and awareness.

## Subjects and Methods

A questionnaire-based study was conducted amongst dental, medical, and nursing interns studying in Gian Sagar Group of Institutions, Punjab, India. All institutions of Gian Sagar Institute come under tertiary health-care level of the health system and provide undergraduate training in medical, dental, and nursing fields. This institute comes under one of the major health care delivery facilities of the Punjab State and caters to medical needs of a large population of the state. Selection of respondents from different departments was based on systematic random sampling. Prior permission was taken from heads of relevant departments of the institutions. Permission and clearance was taken from the institutional

ethics committee. Confidentiality of identity was insured to all the HCWs and a verbal consent was obtained prior to filling up of the questionnaire. The questionnaires were pretested for validity and reliability.

A close-ended questionnaire containing eleven questions was distributed among the respondents. The questions pertained to information regarding knowledge and clinical attitudes and behavior for hepatitis B and C infections. Demographic data including sex and age were asked.

Seven questions with subparts were used to explore knowledge levels. These questions included a question on awareness regarding hepatitis B and C infection and the respondents were supposed to mark if they knew about the hepatitis B and C infection. Another question was based on modes of transmission of hepatitis B and C infection. It included options such as blood and blood products, sharps and needles, sexual intercourse, transmission by mosquitos, hospital acquired infection, and feco-oral route as a mode of transmission. Knowledge about the vaccine against this infection and source of knowledge about the vaccine against hepatitis B were asked, Knowledge regarding exposure to the infection due to their profession and questions regarding the hepatitis vaccine they have received and its dosage received were asked. Three questions with subparts were used to determine behavior and attitudes toward clinical aspect of the disease and toward patients. These questions included questions regarding the necessity of gloving during the insertion of intra-venous cannula, need of pretesting of patients when exposure to blood is involved and methods of preventing cross infection by means of prevention of contamination by use of vaccination, proper disposal of sharps, needles and blood, avoiding needle/sharps injury, avoiding casual sex or/and multiple sexual partners, avoiding drinking contaminated water, and avoiding food not well-cooked. All the questions were close ended questions.

In the study, the sample size consisted of 255 respondents including, 100 dental, 100 medical, and 55 nursing interns. The questionnaire was administered during a 4 week period during the months of August and September in the year 2012, to collect information about the knowledge, attitude and practices of interns regarding hepatitis B and C. The questionnaires were made to be filled in front of the investigator to avoid any kind of discussion or consultation amongst the respondents. Confidentiality of identity was assured to all the respondents and their verbal consent was obtained. The ethical clearance was obtained for the same from the Institutional Ethic Committee. The maximum knowledge score was 15 and the maximum behavior score was 8. Mean knowledge and behavior scores were estimated to compare the knowledge and behavior between various groups and to correlate the knowledge with the behavior toward the disease and its cross infection in clinical practice.

## Statistical analysis

Results obtained were entered into SPSS version 16.0 software for statistical analysis (Chicago IL, USA). These results were statistically analyzed using the Chi-square test, ANOVA test, *post hoc* test and Pearson's correlation. The level of significance was set at  $P$  value  $< 0.05$ .

## Results

A total of 255 subjects were involved in the study including, 100 dental, 100 medical, and 55 nursing interns. All the participants were in the age group of 22-26 years with a mean (SD) age of 23.1 years. The dental, medical, and nursing interns had a mean age of 22.8 years, 23.7 years, and 22.2 years respectively. Dental and medical interns made up the majority of the respondents, accounting for 39.2% (100/255) each respectively. Among all the participants, 31% (79/255) were males and 69% (176/255) were females.

### Knowledge regarding the transmission of hepatitis B and C infection

Results revealed that all respondents were aware of the hepatitis B infection and almost all (99%) (253/255) of the respondents were aware of the hepatitis C infection. The awareness regarding modes of transmission of hepatitis B and C infection suggested that all interns knew about blood and blood products, as a mode of transmission, but awareness in relation to other modes of transmission was dissatisfactory [Table 1].

### Knowledge regarding acquiring hepatitis B infection

76% (76/100) of the dental interns, 81% (81/100) of medical and 63.6% (35/55) of nursing interns believed that HCWs are at a risk of developing hepatitis B infection owing to their profession due to constant contact with their patients, which pre-disposes them to acquire and transmit infection. The difference in the result was almost statistically significant ( $P = 0.05$ ). 69% (69/100) of dental, 68% (68/100) medical and 43.6% (24/55) nursing interns believed that HCWs are at a risk of developing hepatitis C infection owing to their profession due to transmission via the contact with their patients and the difference in the result was statistically significant ( $P < 0.01$ ). These results revealed that not all interns believe that the HCWs can acquire hepatitis B and

C infection owing to their professional contact with their patients. Some interns felt that they were safe from any transmission of infection via patients, which showed a lack of awareness among these interns.

### Knowledge regarding availability of hepatitis B and C vaccine

All dental and medical interns and 87.3% (48/55) nursing interns were aware of the presence of vaccine against HBV. 48% (48/100) of dental, 29% (29/100) of medical and 65.5% (36/55) of nursing interns agreed that the vaccine against HCV exists whereas no such viable vaccine exists at present. The knowledge regarding the existence of hepatitis B vaccine is mainly acquired by the interns due to the curriculum of medical education, which includes study of hepatitis in various subjects including, microbiology, infection control, pathology, medicine, surgery, etc., 56.3% (31/55) of nursing interns claim that they became aware of the vaccine against hepatitis B during a mandatory protocol followed to be vaccinated against common transmissible diseases, while they were getting admission in the college. The difference in the result among the different groups was statistically significant [Figure 1].

### Vaccination status among interns

Nearly, 88% (88/100) of dental interns, 89% (89/100) of medical interns and 78.2% (43/55) of nursing interns were vaccinated against hepatitis B. Out of these only 69.3% (61/88) of dental interns vaccinated against hepatitis B had received a complete three dose schedule of vaccine against hepatitis B. In the other groups, 73% (65/89) of medical and 72% (31/43) of nursing interns had received a complete dose of vaccine against HBV. 24% (21/88) of the dental interns, 17% (15/89) of medical interns and 14% (6/43) of the nursing interns vaccinated against hepatitis B had received only a single dose for the vaccine against HBV, which actually consists of three doses given at 0, 1, 6 months. Results revealed that most of the interns who did not receive the vaccine gave a reason of being too careful while handling patients and did not feel the need to be vaccinated against this infection [Figure 2].

### Knowledge regarding prevention of hepatitis B and C

It was found that 38% (38/100) of dental, 31% (31/100) of medical and 49.1% (27/55) of nursing interns claimed

**Table 1: Awareness regarding modes of transmission of hepatitis B and C infection**

	Dental interns (100 interns) %	Medical interns (100 interns) %	Nursing interns (55 interns) %	Total (255 interns) %	Significance ( $P$ value $< 0.05$ )
Blood and blood products	100	100	100	100	-
Needles and sharps	87.0	86.0	76.4	84.3	0.18
Sexual intercourse	81	79	61.8	76.1	0.02
Faeco-oral and contaminated water	38	29.3	43.6	35.8	0.17
Nosocomial infection	63	74	58.3	66.3	0.09
Mosquitoes	26	17	47.3	27.1	$< 0.01$

to be vaccinated for hepatitis C vaccine whereas no such vaccine exists. 60.8% (155/255) of interns agreed that wearing of gloves should be made mandatory during the insertion of an intra-venous cannula and 85.1% (217/255) of total interns agreed that patients should be screened for Hepatitis B Surface Antigen (Hb<sub>s</sub> Ag) and HCV Ag before undertaking them for any procedure involving exposure to blood. The difference in the result amongst the groups was not statistically significant.

All the interns were aware of preventing hepatitis B and

hepatitis C infection by proper disposal of sharps, needles, and blood, but the other ways of prevention of infection revealed statistically significant difference in results among different intern groups [Table 2].

On applying the ANOVA test, difference in mean awareness score and mean behavior score amongst the various groups was statistically significant. Medical interns had the highest square ANOVA [Table 3]. On applying the *post-hoc* test, knowledge score and behavior score of nursing interns was significantly lower than that of dental and medical interns

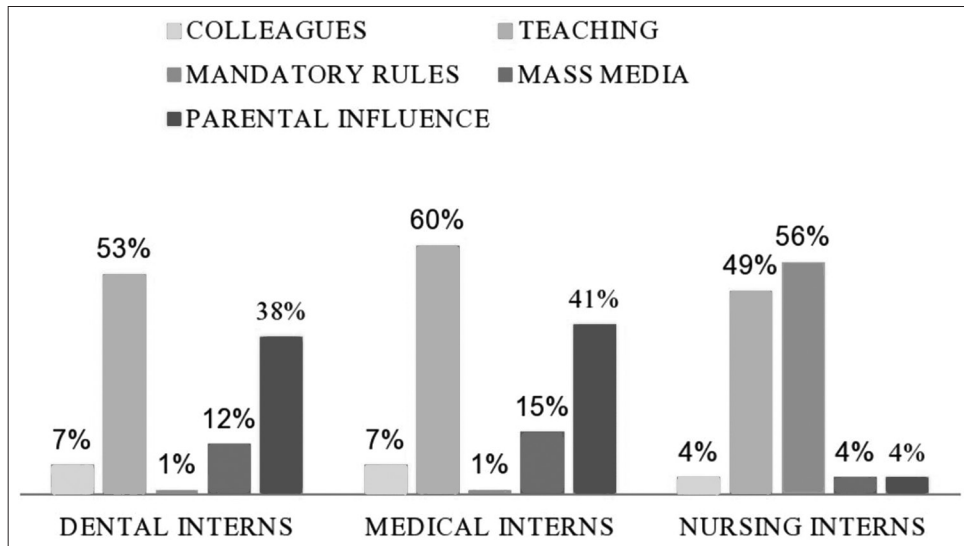


Figure 1: Mode of receiving knowledge about hepatitis B vaccine

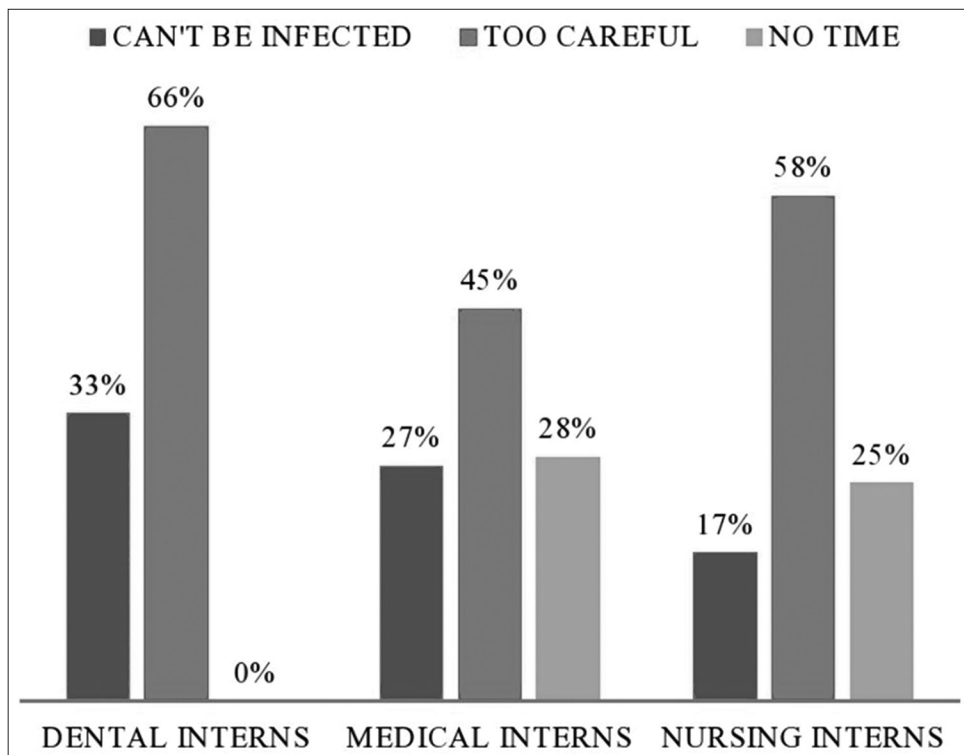


Figure 2: Reasons for not being vaccinated against hepatitis B

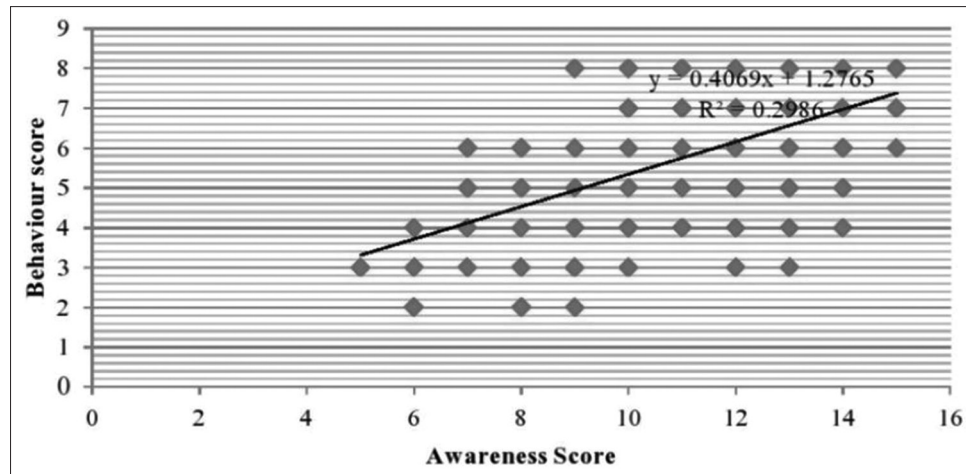


Figure 3: Correlation of awareness score with behavior score (Pearson's correlation)

Table 2: Awareness regarding ways of preventing hepatitis B and C infection

	Dental interns (100 interns) %	Medical interns (100 interns) %	Nursing interns (55 interns) %	Total (255 interns) %	Significance ( $P < 0.05$ )
Vaccination	71	81.5	56.4	71.7	<0.01
Proper disposal of sharps, needles and blood	100	100	100	100	-
Avoid needle/sharps injury	87	86	76.4	84.3	0.18
Avoid casual sex or/and multiple sexual partners	81	79	61.8	76.1	0.02
Avoid drinking contaminated water	50	29.3	43.6	40.6	0.01
Avoid food not well cooked	50	29.3	43.6	40.6	0.01

Table 3: Comparison between awareness score and behavior score (ANOVA test)

	Sum of squares	df	The mean square	F	Significance
Age					
Between groups	86.43	2	43.21	63.17	<0.01
Within groups	172.38	252	0.68		
Total	258.81	254			
Awareness score					
Between groups	128.93	2	64.46	15.46	<0.01
Within groups	1050.47	252	4.17		
Total	1179.39	254			
Behavior					
Between groups	25.85	2	12.93	5.18	<0.01
Within groups	628.27	252	2.49		
Total	654.12	254			

\*Significance is set at 0.05 level

whereas no statistically significant difference was found between the dental and medical interns [Table 4]. Pearson correlation of awareness score with behavior score was found to have direct positive correlation ( $r = 0.55$ ,  $P < 0.01$  showing significance) [Figure 3]. This means that HCWs with low awareness level had dissatisfactory attitude toward the infection including its aspects of transmission across patients and poor attitude toward prevention of cross infection.

## Discussion

Hepatitis B and hepatitis C are major health problems

globally casting an enormous burden on the health-care system and a major source of patient's misery.<sup>[14,15]</sup> They are important causes of hepatocellular carcinoma and are likely to remain a serious health problem resulting in substantial morbidity and mortality for several decades to come.<sup>[16]</sup> These infections are also an important occupational hazard for HCWs. Generally, it is easy to assume that health workers by virtue of their proximity to the health facility should have adequate knowledge about diseases and other health conditions.<sup>[17]</sup> Therefore, this study has been carried out with a motive to assess the knowledge regarding the hepatitis



**Table 4: Multiple comparisons between different groups showing difference in awareness and behavior score (post hoc test)**

Dependent variable	(I) group	(J) group	Mean difference (I-J)	Standard error	Significance	95% confidence interval	
						Lower bound	Upper bound
Age	Dental	Medical	-0.90*	0.12	<0.01	-1.18	-0.62
		Nursing	0.58*	0.14	<0.01	0.25	0.91
	Medical	Dental	0.90*	0.12	<0.01	0.62	1.18
		Nursing	1.48*	0.14	<0.01	1.15	1.81
	Nursing	Dental	-0.58*	0.14	<0.01	-0.91	-0.25
		Medical	-1.48*	0.14	<0.01	-1.81	-1.15
Awareness score	Dental	Medical	-0.46	0.29	0.25	-1.14	0.22
		Nursing	1.43*	0.34	<0.01	0.62	2.23
	Medical	Dental	0.46	0.29	0.25	-0.22	1.14
		Nursing	1.89*	0.34	<0.01	1.08	2.69
	Nursing	Dental	-1.43*	0.34	<0.01	-2.23	-0.62
		Medical	-1.89*	0.34	<0.01	-2.69	-1.08
Behavior	Dental	Medical	-0.43	0.22	0.13	-0.96	0.10
		Nursing	0.41	0.27	0.28	-0.22	1.03
	Medical	Dental	0.43	0.22	0.13	-0.10	0.96
		Nursing	0.84*	0.27	<0.01	0.21	1.46
	Nursing	Dental	-0.41	0.27	0.28	-1.03	0.22
		Medical	-0.84*	0.27	<0.01	-1.46	-0.21

\*The mean difference is significant at the 0.05 level. Editorial comments; every table must maintain a uniform decimal place and all *P* values must reported to the nearest two decimal place with the lowest value as 0.01

infection and help in increasing the awareness level for the benefit of the entire medical fraternity.

A majority of the respondents demonstrated an adequate level of knowledge of hepatitis B and C infection and the routes of transmission of the infection and the fact that the infection can be transmitted as a nosocomial infection. This finding is however, at variance with another study done in Karachi (Pakistan) where the respondents demonstrated a very low knowledge of hepatitis B infection.<sup>[18]</sup> The results were similar but slightly better than another study done on Nigerian HCWs.<sup>[19]</sup>

Hepatitis B vaccine is 95% effective in preventing HBV infection and its chronic consequences.<sup>[20]</sup> 86.3% (220/255) of interns were vaccinated against hepatitis B. It is however, noteworthy that only 71% (157/220) of those who started the vaccination program completed the schedule. The result of the present study is better than another study carried out in Germany where 41.2% of vaccinated participants received the three doses.<sup>[21]</sup> It is also better than findings from Sofola *et al.*<sup>[22]</sup> and Adebamowo<sup>[23]</sup> in their studies carried out in Nigeria among health workers in which only 37.9% and 18.1% of their respondents respectively were reported to be fully vaccinated against hepatitis B infection. Some other studies have also shown similar results.<sup>[24]</sup> In a Knowledge, Attitude and Practice (KAP) study of medical groups with 369 participants in Tehran, Zanjan, and Ahwaz, Iran, 88.1% of studied groups were vaccinated and their knowledge of disease transmission was unsatisfactory.<sup>[25]</sup>

Nearly, 38% (38/100) of dental, 31% (31/100) medical and

49.1% (27/55) of nursing students claim to be vaccinated against hepatitis C infection whereas no viable vaccine against HCV exists at present.<sup>[26]</sup> Poor compliance of health workers to hepatitis B vaccination and lack of knowledge and misconception of existence of hepatitis C vaccine is an issue that deserves serious attention.<sup>[27,28]</sup>

When asked about the reason for not being vaccinated against hepatitis B infection most of the interns stated that they were too careful to acquire the infection. A similar lack of infection control practices and incidence of exposure to needle stick injury was suggested in other studies.<sup>[29-31]</sup> Satisfactory behavior towards methods of preventing the transmission and cross infection of the hepatitis B and C infection was found from the study [Table 2]. Adequate awareness level regarding ways of prevention of hepatitis B infection were found in a KAP study done in Nigeria.<sup>[19]</sup>

HCWs who were weak in knowledge were more likely to show negative attitudes and those who were knowledgeable were more likely to show positive attitudes (*P* value < 0.001 showing significance). There was a positive correlation between knowledge score and attitude [*r* = 0.546, Figure 3]. A similar positive correlation for awareness level and attitude was found in a study done on HCW in Iran.<sup>[32]</sup>

Nearly, 24.7% interns are of the opinion that they are not at risk of contacting the hepatitis B infection due to their profession. 36.3% interns believe that they cannot acquire the hepatitis C infection from their patients. This gap in knowledge of risk perception calls for concern among all health workers because of their high frequency of exposure

to blood and other body fluids coupled with the high contagiousness of HBV and HCV.

### Limitation of the study

This study is a self-reported questionnaire based study. Therefore, in the present study, the subjective self-reported information should be carefully evaluated, due to the limitation of the reliability of the questionnaire surveys.

### Conclusion

HBV and HCV infections are serious public health problems that can have consequences in terms of psychological and occupational diseases. HBV and HCV are common causes of occupational diseases, which can be transmitted from patients to health-care professionals and from the professionals to their patients and may also spread to members of their family due to intimate contact. Fortunately, the infection transmission at occupational level can be prevented by following standard precautions. Discriminatory behavior and attitude is common towards patients with hepatitis infection. Attitudes are directly under the influence of knowledge levels; therefore, it is necessary to increase the level and quality of training among HCWs to prevent discrimination and prejudice towards the infection and the patients.

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