

## Performance of Health Care Workers towards Hepatitis C and B Patients

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### Abstract:

**Background:** Health care workers are a high risk group who are liable for acquiring infection of hepatitis B and C viruses and its transmission to their patients and close contacts. **Aim:** The aim of the present study was to identify performance of health care worker towards hepatitis B and C. **Research Design:** Cross-sectional descriptive study design was used. **Sample & setting** was consisted of 288 physician, nurse, and technician work directly with patients with HBV and HCV at four different settings which are affiliated to Main Mansoura University Hospitals (Specialized Medical Hospital, Gasteriology Center, Maternity and Gynecological Hospital, Egyptian Liver Research Institute and Hospital” in addition to elderly homes at Dakahlia Governorate). **Tools:** two tools were used to collect pertinent data which are structured questionnaire sheet and observational Checklist. **Results:** Results of current study revealed that study sample age ranged from 20 to 50 years with a mean age of  $31.94 \pm 7.40$  years, regarding knowledge, physicians were more knowledgeable than other groups (nurses and technicians). The staff members who work at GIT center, Liver Research Institute and Hospital and Specialized Medical Hospital were more knowledgeable than staff members in other health care settings. 83.3% of health care workers had a positive attitude and more than half of them (58.3%) had a good practice. There was positive correlation between the knowledge, attitude and practice ( $p>0.05$ ). **Conclusion:** The study revealed that, the physicians showed high level of performance regarding hepatitis B and C viruses’ infection compared with nurses and technicians. **The study recommended** that continuous in-service training program in safety measures is essential to all nurses and technicians to update their knowledge and improve their practice to care for patients with viral hepatitis.

**Keywords:** knowledge; attitude; practice; health care workers; hepatitis B and C

### Introduction:

Hepatitis B and C are diseases caused by the hepatitis B and C viruses (HBV and HCV), which are transmitted by contact with the blood or body fluids (i.e., semen, vaginal fluid, etc.) of an infected person<sup>(1)</sup>. Hepatitis B is 100 times more contagious than human immunodeficiency virus (HIV), and can survive on an untreated surface for at least 7 days<sup>(2)</sup>. The natural history of hepatitis B and C are complex, as it starts off as an acute infection that may evolve into chronic disease. It is a major problem because it can cause

chronic infection, resulting in cirrhosis of the liver, liver cancer, liver failure, and death<sup>(3,4)</sup>. Globally, it is estimated that approximately 400 million individuals are chronic carriers of HBV and more than a million people die annually from its related causes.<sup>(3,4)</sup> HBV infection is a major burden in resource-limited countries, accounting for 30% of cases of cirrhosis and 53% of cases of hepato-cellular carcinoma.<sup>(5)</sup> Studies in the Middle East showed that the prevalence of HbsAg ranged from 3% to 11% in Egypt<sup>(6)</sup>. It is estimated that

170 million individuals worldwide (3% of the world population) are chronically infected with HCV and around 80% of HCV infected persons go on to develop chronic hepatitis, up to 20% will develop cirrhosis of the liver and around 5% will develop hepatic cancer. <sup>(5)</sup> More than 50% of the patients with hepatocellular carcinoma are elderly over 60 years old. <sup>(7)</sup> During 2012, the statistical records of the liver diseases department of Specialized Medical Hospital revealed that about (67 %) elderly patients with Hepatitis B and C were admitted to the liver diseases department. <sup>(8)</sup> This high prevalence rate with its sequels makes HBV and HCV infection diseases of major public health problem in worldwide. <sup>(9)</sup>

HBV and HCV have common routes of transmission, such as occupational exposure among health care workers, intravenous drug use or through blood products and contamination during medical procedures. Sexual transmission and mother to child transmission are rare. <sup>(9,10)</sup> The greatest risk of transmission to health care workers is via a contaminated needle stick or sharps injuries. <sup>(11)</sup> Health care workers should follow standard precautions to protect against the transmission of all blood borne viruses. These precautions include safe handling and disposal of sharps into sharp containers, the use of personal protective equipment to prevent exposure to blood or body fluids and hand washing following patient contact. <sup>(12)</sup>

Despite the presence of effective HBV and HCV screening measures and the implementation of a free hepatitis B vaccine program for all neonates, HBV and HCV continues to be a leading cause of mortality in Egypt. <sup>(13)</sup> The persistence of high HBV and HCV-related mortality rates could be attributed in part to a lack of

health provider knowledge, which can be a major obstacle to implementation of preventive programs. To better target HBV and HCV detection and prevention programs, it is necessary to assess existing HBV and HCV knowledge, educational resources, reporting, and preventive practices, particularly among those health professionals who would be responsible for implementing such programs. <sup>(14, 15)</sup>

It is hypothesized that health care workers who are knowledgeable about all aspects of the disease, will have a positive attitude and confidence in treating or handling patients with HBV and HCV. Therefore, it is crucial that all health care workers have a firm foundation of HBV and HCV knowledge to cope with emerging challenges, prevent new infections, and treat those infected and affected by HBV and HCV. <sup>(16, 17)</sup>

### Significance of study:

Hepatitis C and B virus (HCV&HBV) is endemic worldwide, and it causes cirrhosis and other complications that often lead to death; nevertheless, our knowledge of the disease and its mechanisms is limited. HCV is most common in underdeveloped nations, including many in Africa and Asia. The virus is usually transmitted by parenteral routes, but sexual, perinatal, and other types of transfer have been known to occur. Approximately 80% of individuals who contract hepatitis C develop a chronic infection, and very few are able to spontaneously clear the virus. The persistence of high HBV and HCV-related mortality rates could be attributed in part to a lack of health provider knowledge, which can be a major obstacle to implementation of preventive programs <sup>(1, 12)</sup>.

### Aim of the study:

The aim of the present study was

to identify performance of health care workers towards patients with hepatitis B and C.

**Research questions:**

1. What performance do health care workers have towards hepatitis B and C?
2. What are the relationship between knowledge and practice, and attitudes and practice among health care workers towards hepatitis B and C?

**Subjects and Methods:****Study design:**

A cross-sectional descriptive study design was used in this study.

**Setting:**

The study was conducted at four different settings which affiliated to Main Mansoura University Hospitals namely; Specialized Medical Hospital, Gasteriology Center, Maternity and Gynecological Hospital, Egyptian Liver Hospital in addition to elderly homes at Dakahlia Governorate (El Amal, Thamaret El Kalama and Elwalae elderly homes).

**Subjects:**

The study subjects comprised all health care workers of both sexes work directly with patients who have HBV and HCV and accepted to participate in this study. 622 health care workers were enrolled in the study; only 288 continued the study. The sample included (46 physicians, 156 nurses and 86 technicians).

**Tools for data collection:**

In order to collect the necessary data, two tools were used: A Structured questionnaire sheet and an observational checklist were used in this study. They were developed by the researchers based on review of literature.

**(I) A Structured questionnaire sheet:**  
It was used to assess the health care

workers knowledge and attitude related to HBV and HCV which was divided into three parts:

**A. Demographic characteristics:**

Demographic characteristics of the study subjects namely age, gender, marital status, level of education, job category, years of experience and health care setting.

**B. HCV and HBV Knowledge:** This part consists of 61 statements to assess basic knowledge about HBV and HCV as severity of the disease, modes of transmission, prevention and treatment of the disease. Statements were phrased either correctly or incorrectly, and respondents had to choose one option between "true", "false" and "don't know". Each correct answer scored 1, and the wrong answer and "I don't know" scored 0 thus the knowledge score was scaled from 0 to 66. The total scores for each health care worker were further collapsed into categorical data to get poor, moderate and good knowledge. Health care workers scoring a total of (less than 50%) were taken as having poor knowledge, those scoring (50% to less than 75%) had moderate knowledge and those scoring (75 % and above) had good knowledge regarding HBV and HCV.

**C. Attitude towards HBV and HCV:**

The attitudes of health care workers were measured using 9 statements both positive and negative. A 5-point Likert scale was used for assessment. Scores for positive statement (statement no. 3, 4, 5, 7, 8 and 9) were given from 5-1 (5- strongly agree, 4- agree, 3- neither agree nor disagree, 2- disagree and 1- strongly disagree)

and for negative statements (statement number 1, 2 and 6) scores were given from 1- 5 from strongly agree to strongly disagree. Negative statements were reversed for the purpose of analysis. All answers were summed up to obtain mean score, divided all participants into three groups (positive attitude, neutral attitude and negative attitude). Health care workers scoring a total of 15 and less (less than 33.3%) were taken as having poor negative attitude, those scoring 16 to 35 (33.3% to 66.5%) had neutral attitude and those scoring 36 to 45 (66.6% and above) had positive attitude regarding HBV and HCV.

## **2. An observational checklist for HBV and HCV health practice:**

This tool was developed to assess the practice of health care workers for methods of infection control and attending of health education sessions.

### ***Scoring system:***

Scoring of the checklist of each item was made using 3-point likert scale ranging from 1 to 3, where "1" indicates that the skill was never done, "2" sometimes done and "3" always done. Negative statements were reversed for the purpose of analysis. Mean scores were used to classify the participant into three categories (poor, moderate and good performance). Health care workers scoring a total of 14 and less (less than 33.3%) were taken as having poor performance, those scoring 15 to 28 (33.3% to 66.6 %) had moderate performance and those scoring 29 to 42 (66.6% and above) had good performance regarding HBV and HCV.

### ***Content validity and reliability:***

The study tools were tested for content validity by five experts in the related fields as Medical-Surgical Nursing, Geriatric Medicine, and Community Health Nursing, Public Health and Preventive Medicine as well as Hepatology Medicine. The required corrections and modifications were carried out accordingly.

The questionnaire was tested for its reliability by test- retest method. The tool was applied on 40 health care worker selected from Mansoura University Hospital and the tool was repeated again for these health care workers after two weeks. The reliability was assured by Spearman's correlation coefficient  $r = 0.886$

### ***Pilot study:***

A pilot study was conducted on 10% of healthcare workers the previous mentioned settings in order to evaluate the clarity, applicability of the tool and to estimate the time needed to fill the sheet. These workers were excluded from the study.

### ***Fieldwork:***

The researcher started by explaining the purpose of the study and verbal consent from the health care workers to participate in the study was obtained after explanation of the study purpose. The time consumed to answer each questionnaire sheet ranged from 25-30 minutes. Sheet was collected in the same day or maximum next week because the healthcare workers busy during the time of interview. The data collection covered a period of three months from the middle of May till the middle of August 2013.

### ***Administrative and ethical considerations:***

An official permission for data collection was obtained from the

hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing.

Approval for this study was gained from the Research Ethics Committees in faculty of Nursing. The agreement for participation of the subjects was taken orally after the aim of the study explained to them. They informed that their participation is voluntary and they have right to withdraw from the study at any time without giving any reason. Also, they were assured that the information would be utilized confidentially and used for the research purpose only.

#### **Statistical analysis:**

Data entry and statistical analysis were done using SPSS version 16.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and Percentages. Chi-square test was used for comparing quantitative categorical variables. Statistical significance was considered at  $P\text{-value} < 0.05$ .

#### **Results:**

**Table (1):** Shows demographic data of health care workers. It can be noticed that the most of the study sample was females (67.7%), and 54.2 % were nurses. The majority of the study subjects (63.5%) were married and 37.5% of them had the duration of work ranged from 5 to 10 years, the level of education ranged from diploma 3 years to ph degree and more with (26.0% to 6.3%) respectively and the highest percentage of the subjects were working in University hospital (26.0%).

**Table (2):** Illustrates the attitude of health care workers toward hepatitis B and C. It clarifies that more than half (60.4% and 60.8%) of health care workers strongly agreed that there was no risk of exposure to infection by virus B and C because healthy life

style and job exposure for infection with virus B and C while 68.4% of them reported that each patient must be treated or treated like carrying a disease transmitted by blood. Nearly three quarters (74.3%) reported that health insurance system must provide free of charge treatment for all infected person especially elderly people. The majority of health care workers (81.6%) strongly agreed that vaccination against the virus B must be free of charge and available for each healthcare worker.

**Table (3):** Concerns with health care workers practice toward hepatitis B and C. As can be noticed more than two thirds of health care workers (68.8 % and 67.7% respectively) always place the needles and syringes and sharp objects in a special container immediately after use and wash hands before and after any therapeutic procedure. More than half (59 %) of health care workers always wear gloves before handling a patient or secretions from the body while ( 55.2 % and 63.2 %) of them never participated in the programs of health education on HBV and HCV respectively.

**Table (4):** Presents performance of health care workers toward hepatitis C and B. It indicates that 47.9% of study subjects had a good knowledge level while 33.7 % of them had a moderate knowledge level and the rest of the subjects had a poor knowledge. Regarding the attitude of health care workers toward hepatitis C and B, more the three quarters of study sample (83.3%) had a positive attitude, followed by 15.6% of them had a neutral attitude. Concerning practice of health care workers toward hepatitis C and B, more than half (58.3%) of study subjects had a good practice and 41.7% had a moderate practice.

**Table (5):** Clarifies correlation between knowledge, attitude and

practice of health care workers toward hepatitis C and B. It reveals that both total score of knowledge and total score of attitude of study subjects correlated significantly with poor or negative attitude and poor knowledge. In addition, the study subjects with positive attitude had good knowledge score. On the other hand, there were significant relations between moderate score of practice and moderate score of knowledge.

**Table (6):** Demonstrates correlation between attitude and practice of health care workers toward hepatitis C and B. As can be seen in the table, both total score of attitude and total score of practice of study subjects correlated significantly with neutral attitude and moderate practice. In addition, the study subjects with positive attitude had good score of practice.

**Table (7):** Displays correlation between demographic characteristics and performance of health care workers. According to the table, it was found that positive correlation between performance ( $p>0.05$ ) and demographic data such as, sex (male more knowledgeable than female), job (physician more knowledgeable than other job, and educational level (the highest level of education more knowledgeable and had positive attitude more than other educational level. Regarding duration of work, more than 10 years of work had highest score of knowledge and positive attitude and good practice. There is a statistically significance correlation between work setting and total score of knowledge.

### Discussion:

HBV and HCV are important occupational hazards for health care workers. They are preventable with safe and effective precautions. It is easy to generally assume that health

workers by virtue of their proximity to the health facility should have adequate knowledge about diseases and other health conditions.<sup>(18)</sup> The aim of the present study was to identify knowledge, attitude and performance of health care workers towards patients with hepatitis B and C.

In the present study, participants' knowledge concerning the various aspects of HBV and HCV were generally good, since the majority of them were aware about the route of transmission, complications, treatments and the way of preventing the infection. This is in line with Samuel et al.<sup>(18)</sup> who studied the workers' knowledge, attitude and behavior towards hepatitis B infection in Southern Nigeria and concluded that, the majority of respondents demonstrated a high level of knowledge of hepatitis B infection and the fact that the infection can be transmitted as a nosocomial infection. A study conducted in Kuwait by Habiba et al.,<sup>(19)</sup> concluded the same results.<sup>(19)</sup> This finding is however at variance with another study done in Pakistan where the respondents demonstrated a very low knowledge of HBV infection.<sup>(20)</sup> A study conducted in Australia revealed that the overall knowledge of health care workers regarding HCV was poor.<sup>(12)</sup> This finding is encouraging considering the fact that knowledge is usually the first step towards modification of a desirable behavior. However, despite the respondents high knowledge of infection, more than half of them is of the opinion that they are not at risk of contracting the infection. This gap in knowledge of risk perception calls for concern among all stakeholders seeing that health workers have a high risk of being infected with hepatitis B and C virus because of their high frequency of exposure to blood and other

fluids.<sup>(21)</sup>

In the current study, physicians were more knowledgeable than other groups (nurses and technicians). This is in agreement with study conducted in Iran who revealed that physicians were more knowledgeable than other groups.<sup>(22)</sup> On the same line two studies in Iran showed a significant relationship between medical groups and mean knowledge scores: doctors were the most knowledgeable group.<sup>(23, 24)</sup> The higher knowledge level of physicians was likely because of more advanced and professional education on gastrointestinal and liver diseases.<sup>(22)</sup>

In the present study, health care workers who were more than 40 years old were more knowledgeable. This is in accordance with Joukar et al.,<sup>(22)</sup> and Richmond et al.<sup>(23)</sup> who reported that we should not ignore the role of practice as a form of education as in the present study those who had duration in the work of 10 years and above were more knowledgeable. These findings show that, older age associated and greater experience can be associated with greater knowledge.

Education is effective agent for developing health care workers knowledge. This is in the same line with the current study which indicated that higher educational level associated with advance in knowledge levels. This is in harmony with other study conducted in Iran who revealed that, education was introduced as an effective agent for developing health care workers knowledge.<sup>(22)</sup> On the contrary, a study done by Richmond et al,<sup>(23)</sup> concluded that, while complementary therapists were the group most likely to have been educated about hepatitis C, they were not the most knowledgeable. In the same direction, studies conducted in London indicated that education did not produce any advance in knowledge

level. These discrepancies indicated that, other factors must influence the knowledge level of health care workers. However, we should not deny the fact that educational level cannot be effective if it has not been associated with repeated training and updating knowledge.<sup>(24, 25)</sup>

Work places significantly affect the level of knowledge of health care workers. Those staff members who work at GIT center, Liver Research Institute and Hospital and Specialized Medical Hospital were more knowledgeable than staff members in other health care setting. This may have been because staff that work at these setting is learnt more about HBV and HCV through caring for someone who had it, or that the knowledge they had was more easily retained through reinforcement via clinical practice. In the same direction, a study done in Australia showed that staff members who had the most experience, who had recently cared for someone with HCV, and who had the greatest contact with blood and body fluids and the most responsibility for patient care, had the greatest knowledge regarding HCV.<sup>(12)</sup>

Regarding attitude of health care workers toward patients with HBV and HCV, the present study revealed that, the majority of them had positive attitudes towards HBV and HCV infections. Physicians, male and higher educational level were the most group had positive attitude towards hepatitis B and C. This may be related to the fact that these groups were the most knowledgeable. These findings were also noted by van de Mortel<sup>(12)</sup> and Richmond et al.<sup>(23)</sup> However; it should be considered that health care workers attitudes on hepatitis B and C patients might be influenced by the attitudes of colleagues. A problem associated with consulting colleagues is that the information provided could be inaccurate, outdated, or reflect just

subjective clinical experiences about people with hepatitis.

Concerning performance of health care workers toward HBV and HCV, the present study revealed that, more than half of them had good performance towards HBV and HCV infections. This finding may be attributed to the participation of health workers in educational program about HBV and HCV. These results are in the same line of those of Goswami et al. <sup>(26)</sup> in India where they confirmed that high practice level of health care workers attributed to the instruction manual and the responsibility given to the staff for implementation of rules by the authorities.

A vaccine against hepatitis B infection has been available since 1982. Hepatitis B vaccine is 95% effective in preventing HBV infection and its chronic consequences, and it is the first vaccine against a major human cancer. Vaccination rates however have been found to be low among health care workers who paradoxically, given their level of exposure are supposed to have higher vaccine coverage rates. In this study, though majority of the respondents had positive attitude towards the hepatitis B and C infection and vaccine, only nearly half of them afraid of infection because they did not receive vaccination. This is in accordance with the study done in Nigeria which revealed that only 70.2% of health care worker had ever received hepatitis B vaccine and they reported that, the potential reasons for low vaccination coverage were: busy schedules, lost time and income and perception of low risk status. <sup>(18)</sup> This lack of compliance to hepatitis B vaccination among health workers calls for concern among stakeholders seeing that the only way to prevent hepatitis B infection among

health workers is through effective vaccination programmes and adherence to universal precaution which oftentimes cannot be guaranteed. This is evidenced from this study where some of the respondents still don't wear gloves (16.0%), or protective gown (19.4 %), or places the needles and syringes and sharp objects in a special container immediately after use (10.1 %) or recover the syringes manually after injection or taking blood sample (22.6%).

In the current study, there was a significant correlation between health care workers' knowledge levels and attitudes. This finding was also reported in other studies which mentioned that health care workers' attitudes were affected by their knowledge level and influenced their willingness to treat patients with hepatitis C. Also they revealed that, occupational experience and fear of contracting hepatitis C can influence the willingness to treat people with hepatitis C. <sup>(12, 21, and 23)</sup>

### **Conclusion:**

In the light of the main study findings, it can be concluded that the physicians showed high level of performance regarding hepatitis B and C viruses' infection compared with nurses and technicians and there is a positive correlation between knowledge and attitudes among health care workers towards hepatitis B and C.

### **Recommendations:**

Based on the results of the present study, the following recommendations were suggested: Continuous in-service training program in safety measures is essential to all nurses and technicians to update their knowledge and improve their practice to care for patients with viral hepatitis.



**Table (1): Demographic data of health care workers**

Items	N=288	%
<b>Age (in years):</b>		
▪ 15-	118	41.0
▪ 30-	123	42.7
▪ >40y	47	16.3
<hr/>		
<b>Mean ± SD</b>	SD=31.94±7.40	
<hr/>		
<b>Sex:</b>		
▪ Male	93	32.3
▪ Female	195	67.7
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<b>Marital status:</b>		
▪ Single	94	32.6
▪ Married	183	63.5
▪ Widow	9	3.1
▪ Divorced	2	0.7
<hr/>		
<b>Job:</b>		
▪ Physician	46	16.0
▪ Nurse	156	54.2
▪ Technician	86	29.9
<hr/>		
<b>Duration of work:</b>		
▪ <5	106	36.8
▪ 5-10	108	37.5
▪ >10	74	25.7
<b>Mean ± SD</b>	SD=1.88±0.784	
<hr/>		
<b>Level of education:</b>		
▪ Diploma 3year	75	26.0
▪ Diploma 5year	15	5.2
▪ Technical institution	79	27.4
▪ BSC	68	23.6
▪ Master degree	33	11.5
▪ Ph degree	18	6.3
<hr/>		
<b>Setting of health care:</b>		
▪ University Hospital	75	26.0
▪ Liver and Research Hospital	61	21.2
▪ Specialized Medical Hospital	41	14.2
▪ Elderly homes	16	5.6
▪ GIT Center	53	18.4
▪ Gynecological Hospital	42	14.6

**Table (2): Attitude of health care workers toward hepatitis B and C**

Variables	Strongly disagree		Disagree		Unknown		Agree		Strongly agree	
	N.	%	N.	%	N.	%	N.	%	N.	%
1. No risk of exposure to infection by the virus B&C because healthy life style.	8	2.8	15	5.2	29	10.1	62	21.5	174	60.4
2. No risk of exposure to infection by the virus B &C because careful manner are used when examined or taking sample from patients.	7	2.4	58	20.1	32	11.1	86	29.9	105	36.5
3. Each patient must be treated or treated like carrying a disease transmitted by blood	15	5.2	16	5.6	21	7.3	39	13.5	197	68.4
4. My job expose me to infected with virus B and C	11	3.8	12	4.2	26	9.0	64	22.2	175	60.8
5. Vaccination against the virus B must be free of charge and available for each healthcare worker.	11	3.8	17	5.9	18	6.3	7	2.4	235	81.6
6. Vaccination against the virus B may be expensive for me so if it is not free I cannot obtain it	32	11.1	96	33.3	27	9.4	129	44.8	4	1.4
7. Examine all patients when they admitted to hospital to make sure of the presence or absence of virus B and C	9	3.1	21	7.3	25	8.7	77	26.7	156	54.2
8. Afraid of infection with B&C because I did not receive vaccination	7	2.4	43	14.9	28	9.7	80	27.8	130	45.1
9. Health insurance system must provide free of charge treatment for all infected person especially elderly people.	8	2.8	14	4.9	22	7.6	30	10.4	214	74.3

**Table (3): Practice of health care workers toward hepatitis B and C**

Variables	Never		Sometimes		Always	
	N.	%	N.	%	N.	%
1. Re-cover the syringes manually after giving the drug by injection or after taking a blood sample.	65	22.6	135	46.9	88	30.6
2. Place the needles and syringes and sharp objects in a special container immediately after use.	29	10.1	61	21.2	198	68.8
3. Wear gloves before handling a patient or secretions from the body.	46	16.0	72	25.0	170	59.0
4. Wash hands before and after any therapeutic procedure.	33	11.5	60	20.8	195	67.7
5. Wear 'Protective gown to protect yourself when dealing with any patient.	56	19.4	208	72.2	24	8.3
6. Check or review the results of a blood test to make sure the patient of the presence or absence of infectious diseases before any action.	61	21.2	189	65.6	38	13.2
7. Be sure that the tools used are always sterilized before use.	58	20.1	85	29.5	145	50.3
8. Wearing a mask before dealing with any patient	87	30.2	135	46.9	66	22.9
9. Participated in the programs of health education on HIV (B).	159	55.2	80	27.8	49	17.0
10. Participated in the programs of health education on HIV (C).	182	63.2	70	24.3	36	12.5
11. Is there any educational method or counseling for virus B in your place of work?	67	23.3	70	24.3	151	52.4
12. Is there any educational method or counseling for virus C in your place of work	50	17.4	93	32.3	145	50.3
13. provide health education to patient with virus C	161	55.9	94	32.6	33	11.5
14. provide health education to patient with virus B.	160	55.6	92	31.9	36	12.5

**Table (4): Performance of health care workers toward hepatitis C and B**

Items	N=288	%
<b>Total score of knowledge:</b>		
▪ Poor knowledge	53	18.4
▪ Moderate knowledge	97	33.7
▪ Good knowledge	138	47.9
<b>Attitude toward hepatitis C and B :</b>		
▪ Poor and negative Attitude	3	1.0
▪ Neutral Attitude	45	15.6
▪ Positive Attitude	240	83.3
<b>Practice toward hepatitis C and B :</b>		
▪ Poor	0	0.0
▪ Moderate practice	120	41.7
▪ Good practice	168	58.3

**Table (5): Correlation between knowledge, attitude and practice of health care workers toward hepatitis C and B**

Items	Total score of knowledge							P- value
	Poor		Moderate		Good		Total	
	N.	%	N.	%	N.	%		
<b>Attitude toward hepatitis C and B</b>								
▪ Negative	3	100.0	0	0	0	0	3	.000
▪ Neutral	28	62.2	17	37.8	0	0	45	
▪ Positive	22	9.2	80	33.3	138	57.5	240	
<b>Practice toward hepatitis C and B</b>								
▪ Moderate practice	48	40.0	43	35.8	29	24.2	29	.000
▪ Good practice	5	3.0	54	32.1	109	64.8	109	

**Table (6): Correlation between attitude and Practice of health care workers toward hepatitis C and B**

Items	Attitude toward hepatitis C and B								P-value
	Negative		Neutral		Positive Attitude		total		
	No.	%	No.	%	No.	%			
<b>Practice toward hepatitis C and B</b>									
▪ Moderate practice	3	100	39	86.7	78	32.5	120	.000	
▪ Good practice	0	0	6	13.3	162	67.5	168		

Table (7): Correlation between demographic characteristics and performance of health care workers

Demographic Characteristics	Level of knowledge						Attitude						Level of practice				k	A	p
	Poor		Moderate		Good		Negative		Neutral		Positive		Moderate		Good				
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%			
Age in years																			
▪ 15-	17	14.4	45	38.1	56	47.5	3	2.5	11	9.3	104	88.1	47	39.8	71	60.2	.086	.024	.472
▪ 30-	22	17.9	43	35.0	58	47.2	0	0.0	27	22.0	96	78.0	56	45.5	67	54.5			
▪ >40	14	29.8	9	19.1	24	51.1	0	0.0	7	14.9	40	85.1	17	36.2	30	63.8			
Sex:																			
▪ Male	4	4.3	26	28.0	63	67.7	0	0.0	1	1.1	92	98.9	19	20.4	74	79.6	.000	.000	.000
▪ Female	49	25.1	71	36.4	75	38.5	3	1.5	44	22.6	148	75.9	101	51.8	94	48.2			
Marital status:																			
▪ Single	12	12.8	32	34.0	50	53.2	1	1.1	14	14.9	79	84.0	24	25.5	70	74.5	.342	.851	.000
▪ Married	41	22.4	60	32.8	82	44.8	2	1.1	28	15.3	153	83.6	93	50.8	90	49.2			
▪ Widow	0	0.0	4	44.4	5	55.6	0	0.0	3	33.3	6	66.7	3	33.3	6	66.7			
▪ Divorced	0	0.0	1	50.0	1	50.0	0	0.0	0	0.0	2	100.0	0	0.0	2	100.0			
Job :																			
▪ Physician	2	2.3	15	17.4	69	80.2	0	0.0	4	4.7	82	95.3	21	24.4	65	75.6	.000	.000	.000
▪ Nurse	47	30.1	64	41.0	45	28.8	3	1.9	40	25.6	113	72.4	83	53.2	73	46.8			
▪ Technician	4	8.7	18	39.1	24	52.2	0	0.0	1	2.2	45	97.8	16	34.8	30	65.2			
Work experience:																			
▪ <5	21	19.8	35	33.0	50	47.2	3	2.8	16	15.1	87	82.1	48	45.3	58	54.7	.037	.161	.173
▪ 5-10	21	19.8	45	41.0	42	38.9	0	0.0	20	18.5	88	81.5	48	44.4	60	55.6			
▪ >10	11	14.9	17	23.0	46	62.2	0	0.0	9	12.2	65	87.8	24	32.4	50	67.6			
Education:																			
▪ Diploma 3 years	33	44.0	32	42.7	10	13.3	2	2.7	23	30.7	50	66.7	45	60.0	30	40.0	.000	.000	.000
▪ Diploma 5 years	5	33.3	4	26.7	6	40.0	0	0.0	4	26.7	11	73.3	9	60.0	6	40.0			
▪ Technical institute	7	8.9	27	34.2	45	57.0	1	1.3	3	3.8	75	94.9	31	39.2	48	60.8			
▪ BSC.	7	10.3	23	33.8	38	55.9	0	0.0	13	19.1	55	80.9	22	32.4	46	67.8			

Continue table (7)

Demographic Characteristics	Level of knowledge						Attitude				Level of practice						k	A	p
	Poor		Moderate		Good		Negative		Neutral		Positive		Moderate		Good				
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%			
▪ Master degree	1	3.0	7	21.2	25	75.8	0	0.0	2	6.1	31	93.9	11	33.3	22	66.7	.000	.733	.073
▪ ph degree	0	0.0	4	22.2	14	77.8	0	0.0	0	0.0	18	100.0	2	11.1	16	88.9			
Work setting:																			
▪ University hospital	23	30.7	13	17.3	39	52.0	1	1.3	13	17.3	61	81.3	32	42.7	43	57.3			
▪ Liver institute	5	8.2	21	34.4	35	57.4	1	1.6	8	13.1	52	85.2	29	47.5	32	52.5			
▪ Medical hospital	3	7.3	18	43.9	20	48.8	0	0.0	3	7.3	38	92.7	15	36.6	26	63.4			
▪ Elderly home	0	0.0	4	25.0	12	75.0	0	0.0	2	12.5	14	87.5	1	6.3	15	93.8			
▪ GIT center	8	15.1	21	39.6	24	45.3	0	0.0	12	22.6	41	77.4	24	45.3	29	54.7			
▪ Maternity hospital	14	33.3	20	47.6	8	19.0	1	2.4	7	16.7	34	81.0	19	45.5	23	54.8			

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: ضوء النتائج الرئيسية للدراسة  
الحالية تم اقتراح التوصيات التالية: