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Assessment of risk factors of hepatitis B and hepatitis C infection and knowledge regarding its transmission among adults, New Delhi, India

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Abstract
Introduction: Hepatitis B Virus infection and Hepatitis C Virus infection is a global health problem affecting millions of people worldwide, causing an estimated 1.3 million deaths each year from acute infection and hepatitis-related liver cancer and cirrhosis. It is estimated that more than two billion people are infected with Hepatitis B virus worldwide and about 350 million of them suffer from chronic Hepatitis B virus infection. There is also about 177.5 million carriers of Hepatitis C virus, resulting in about 350,000 global deaths occur every year. Health education regarding about risk factors of Hepatitis B and C infection and knowledge regarding prevention of transmission is helpful in decreasing the Hepatitis B and C infection among adults in community. The aim of this study is to assess the risk factors of Hepatitis B and C infection and knowledge regarding its transmission among adults.
Methods: Quantitative research study using survey method was used for the present study. Convenient sampling technique was used to enrolled 500 adults attending a selected clinic at Delhi Government Dispensary, Chhatarpur, Delhi. A structured tool was prepared to assess the risk factors of Hepatitis B and C infection among adults. A structured knowledge questionnaire was prepared to assess the knowledge regarding transmission of Hepatitis B and C among adults.
Results: The mean knowledge score of the adults was 5.6 with the mean percentage of 37.4 percent. The knowledge scores ranged from 0 to 13 with a standard deviation of 3.17. The knowledge score was highest in the domain 'Transmission of Hepatitis B and C infection' with mean score 2.80 and mean percentage score of 46.8 percent followed by the knowledge in domain 'General information regarding Hepatitis B and C infection' with a mean score 1.57 and mean percentage of 31.4 percent. The least knowledge was found in domain 'Prevention of transmission of Hepatitis B and C infection' with a mean score 1.24 and mean percentage of 31 percent. There was significant association found between knowledge regarding prevention of transmission of Hepatitis B and C with type of family of the adults (p= 0.01). There was significant association between knowledge and the risk factors namely, History of dental procedures (p= 0.01), History of jaundice (p= 0.01, History of working in hospital/ clinic (p= 0.02), History of handling biomedical waste in biomedical waste management unit/ hospital (p= 0.01), Sharing of razors (p= 0.001) and regularly visiting barber shop for shaving (p= 0.03).
Conclusion: It concluded that adults had least knowledge in the domain 'Prevention of Hepatitis B and C infection'. The knowledge regarding prevention of transmission is associated with risk factors namely, History of dental procedures, History of jaundice, History of working in hospital/ clinic, History of handling biomedical waste in biomedical waste management unit/ hospital, Sharing of razors and Regular visiting barber shop for shaving.

Keywords: Knowledge, clinical features, complications, coronary artery disease, adults

Introduction
According to World Health Organization (WHO) estimates that two billion people in the world have been infected with Hepatitis B Virus infection and about 350 million people live with chronic HBV infection, about 600,000 people die from Hepatitis B Virus - related liver disease or HCV each year. The prevalence of chronic HBV infection varies geographically, from high (> 8 percent), intermediate (2–7 percent) to low (< 2 percent) prevalence (World Health Organization, 2017).
In India Hepatitis B and C is increasingly being recognized as a public health problem in India. Hepatitis B Virus and Hepatitis C Virus are important causes of acute viral hepatitis and Acute Liver Failure (ALF). Hepatitis B Virus is responsible for 10-30 percent of acute hepatitis and 5-15 percent of acute liver failure cases in India.

It is further reported that Hepatitis C Virus responsible for 10-40 percent of acute hepatitis and 15-45 percent of acute liver failure (MHFW, 2014).

Proper knowledge among general population about prevention of transmission of Hepatitis B and C such as avoiding high-risk sex, unsafe injection practices and tattooing and importance of regular screening and vaccination against Hepatitis B should be performed for high-risk patients (i.e. sexual and household members in close contact with patients/carriers, health care workers, dialysis patients, intravenous drug users, persons who receive multiple blood transfusions, participate in acupuncture, are incarcerated, or on immunosuppressive, biologics or cancer chemotherapy, etc.) (Garg, Sarin, Kumar, Garg, Sharma, Kumar, (2011) [9].

A safe and effective vaccine against Hepatitis B Virus is available for 20 years and is effective in preventing infection and others serious consequence of hepatitis including liver cancer and cirrhosis when given before or after exposure. Vaccination gives long term protection from Hepatitis B infection (Bajubair, *et al*., 2008) [6].

Problem Statement

A study to assess the risk factors of Hepatitis B and Hepatitis C infection and knowledge regarding its transmission among adults attending clinic at a selected Delhi Government Dispensary.

Aim of the study: The aim of the present study is to assess the risk factors of Hepatitis B and C infections and knowledge regarding prevention of its transmission among adults.

Objectives of the Study

Primary objectives

1. To assess the risk factors of Hepatitis B and C infections among adults attending clinic at a selected Delhi Government Dispensary.
2. To assess the knowledge regarding transmission of Hepatitis B and C among adults attending clinic at a selected Delhi Government Dispensary.

Secondary objectives

1. To find the association of knowledge regarding transmission of hepatitis B and Hepatitis C infections among adults with their selected demographic variables.
2. To find out the association between the knowledge regarding transmission of Hepatitis B and C infection among adults with their risk factors of Hepatitis B and C.

Hypotheses

All hypotheses are tested at 0.05 level of significance:

H_1: There is a significant association between the knowledge regarding transmission of Hepatitis B and C among adults attending a selected Delhi Government Hospital with their demographic variables.

H_2: There is a significant association between the risk factors of Hepatitis B and C and knowledge regarding its transmission among adults attending a selected Delhi Government Hospital as measured by structured tool for assessment of risk factors of Hepatitis B and Hepatitis C and structured knowledge questionnaire.

Methodology

Study Setting: For this study, Delhi Government Dispensary, Block A, Chhatarpur, New Delhi- 110074, India was selected. This study has been conducted during February- March 2020.

Study sample and sampling: A Convenient sampling technique was used in the present study. An estimated sample size of 500 participants with a prevalence rate of 2 to 3 percent In India having design effect within 95% confidence interval. Sample of the present study compromised of all the adult persons/or their relatives who were attending clinic at Delhi Government Dispensary Chhatarpur, New Delhi, India.

Study data collection: A community-based cross-sectional study was conducted among healthy population of adults who were attending clinic at Delhi Government Dispensary Chhatarpur, New Delhi, India. Ethical approval to conduct the study was granted from the ethics committee under the study no CONEC/ILBS/06/19/Dated14.06'19.

Study analysis: Data is analysed using both descriptive (mean, median, range, percentage and standard deviation) and inferential (One Way ANOVA test and Independent 't' Test) statistics based on the objectives of the study by using SPPS version 22.

Results

Demographic Variables: A total of 500 adult participants were involved in the study. About 55.7 percent of adults were between the age of 18-31 years and 60.6 percent were female and 39.4 percent were male. Majority of adults, 69.8 percent were married and 28.8 percent of adults were unmarried. Mostly, 69.6 percent of the adults belonged to joint family. It was found that 19.8 percent of Female adults had home delivery and 79.3 percent of adults had institutional delivery. Approx. 50.7 percent of adults had two children and 33.2 percent of adults had one child. Nearly, 16.1 percent of adults had more than three children and 25.7 percent of adults did not have a child yet. It was found that all the members of 33.2 percent of adults had been immunized against Hepatitis B and 27.6 percent of adults had reported that some of the family members had been immunized against Hepatitis B. whereas 33 percent of adults didn't know about their family members' Hepatitis B immunization status. Approximately 6.2 percent of adults reported that none of the family member is immunized against Hepatitis B. In relation to educational level it was noted that 34 percent of adults were graduate and 24.8 percent of adults were having high school certificate and socio- economic class of adults, half the number (50.2 percent) of adults belonged to upper lower socioeconomic class. Likewise, a small percentage (3.0 percent) were in lower socioeconomic class.

Section I

Risk factors of Hepatitis B and Hepatitis C of adults by their Medical History, Family History, Work History, Personal History and Social History

Table 1: Frequency and Percentage Distribution of adults by their Risk Factors of Hepatitis B and C: - Domain - Medical History, Family History, Work History, Personal Care History and Social History n=500

Risk Factor	Frequency	Percentage
Domain: Medical History		
Diagnosed with Hepatitis B Virus or Hepatitis C Virus infection	8	1.6
History of requiring treatment in emergency department	92	8.4
History of hospitalization	232	46.4
Not immunized for Hepatitis B	303	60.6
History of blood transfusion	37	7.4
History of dental procedures	122	24.4
History of haemodialysis	6	1.2
History of jaundice	54	10.8
History of HIV infection	7	1.4
History of major surgery	71	14.2
History of accidental needle stick injury	6	1.2
Family History		
History of family member with Hepatitis B infection.	8	1.6
History of family member with Hepatitis C infection.	1	0.2
Work History		
History of work in hospital/ clinic.	64	12.8
History of handling biomedical waste (BMW) in BMW management unit/ hospital.	38	7.6
Personal Care History		
History of Pierced ears	297	59.4
History of having a tattoo	92	18.4
Sharing of razors	13	2.6
Regularly visiting barber shop for shaving	122	24.4
Social History		
History of having sex with person of same sex	23	4.6
History of sex with multiple partners	16	3.2
History of injected drugs/ self-injected for recreational purpose	5	1.0

Table 1 show the result about 1.6 percent of adults were having history of Hepatitis B infection and 18.4 percent of adults had history required emergency treatment and 46.4 percent of adults had history of hospitalization. A large percentage 60.6 percent of adults reported that they were not immunized for Hepatitis B. 7.4 percent of adults reported of having received blood transfusion and 24.4 percent of the adults had history of undergoing dental procedures. Whereas, 1.2 percent of adults were having history of haemodialysis and10.8 percent of adults were having history of jaundice and 1.4 percent of adults were having history of HIV infection and 14.2 percent of adults were having history of undergoing major surgery whereas 1.2 percent of adults were having history of accidental needle stick. It was found that 1.6 percent of adults had family history of Hepatitis B Infection and 0.2 percent of adults had family history of Hepatitis C infection. Approximately 12.8 percent of adults were working in clinic or hospital and 7.6 percent of adults were handling biomedical waste in biomedical waste management unit/ hospital. It was found that 59.9 percent of adults had history of pierced ears and 18.4 percent of adults had undergone tattooing. Whereas 24.4 percent of adults were regularly visiting barber shop for shaving and about 2.6 percent adults had history of sharing razor. It was found that 4.6 percent of adults had a history of sex with person of same sex and 3.2 percent of adults had history of sex with multiple partners. Whereas, 1.0 percent of adults used to take injectable drugs/ self-injected for recreational purpose.

Section II

Table 3: Frequency and Percentage distribution of adults by their level of knowledge related to General Information regarding Hepatitis B and C n=500

Knowledge in Domain 'General Information Regarding Hepatitis B and C'	Frequency	Percentage
Hepatitis C is caused by Hepatitis C virus	189	37.8
Hepatitis C is curable	287	57.8
Hepatitis C has potential for chronicity	261	52.2
Incubation period for Hepatitis B is one month to six months	115	23.0
Incubation period for Hepatitis C is one to three months	183	36.6
The common symptoms of Hepatitis B and C include:		
– Nausea & vomiting	226	45.2
– Loss of appetite	274	54.8
– Jaundice	363	72.6
– All the three- Nausea& vomiting, Loss of appetite and Jaundice	190	38.0
The long-term consequences of Hepatitis B and C include		
– Cirrhosis of the liver	226	45.2
– Liver failure	288	57.6
– Liver cancer	309	61.8
– All the three i.e. Cirrhosis, Liver failure and Liver cancer	170	34.0

The table 2 reveals that 37.8 percent of adults knew that Hepatitis C is caused by Hepatitis C virus and 57.8 percent of adults were aware that Hepatitis C is curable while 52.2 of participants were aware that Hepatitis C has high chronicity potential. Whereas 45.2 percent of adults knew that nausea and vomiting is a common symptom of Hepatitis B and C and 54.8 percent were aware that loss of appetite is a common symptom. Majority of the adults (72.6 percent) were aware that jaundice is a common symptom of Hepatitis B and C. The knowledge of adults about long-term consequences of Hepatitis B and C namely 1) Cirrhosis of liver, 2) Liver failure and 3) Liver cancer was found in 45.2 percent, 57.6 percent and 61.8 percent of adults respectively.

Table 3: Frequency and Percentage of adults by their level of knowledge regarding transmission of Hepatitis B and C n=500

Knowledge in Domain: 'Transmission of Hepatitis B and C'	Frequency	Percentage
Hepatitis B and Hepatitis C is transmitted by contact with infected blood	279	37.8
Hepatitis B and Hepatitis C is transmitted by:		
– Transfusion of infected blood and blood products	96	59.2
– Sexual route	222	44.8
– Sharing contaminated injections/needles	355	71.0
– All i.e. Sexual route, transfusion of infected blood and blood products and Sharing of contaminated injections/needles	195	39.0
Hepatitis B can be vertically transmitted	337	67.4
Hepatitis C can be vertically transmitted	351	70.2
Both Hepatitis B and C can be vertically transmitted	255	51.0
Hepatitis B can be transmitted through piercing and tattooing	227	45.4
Hepatitis B does not transmit by Hugging and kissing	267	53.4
Awareness of the following risk factors for contracting Hepatitis B and C:		
– Piercing and tattooing	257	51.4
– Heterosexuality	320	64.0
– Multiple sexual partners	266	53.2
– All the three i.e. Piercing and tattooing, Heterosexuality and Multiple sexual partner	180	36.0

The data in Table 3 shows the frequency distribution of adults according to the level of knowledge related to transmission of Hepatitis B and C infection. It was found that 55.8 percent of adults were aware that Hepatitis B and C is transmitted through contact with infected blood and 59.2 percent of adults were aware that it can be transmitted through transfusion of infected blood and blood products. Out of all the adults, 44.8 percent were aware that hepatitis B and C can be transmitted by sexual route. Majority of the adults (71 percent) knew that the infection can be transmitted by sharing of contaminated injections/needles More than half the number of adults (67.4 percent) answered for Hepatitis B and 70.2 percent of adults answered for Hepatitis C as an infection that can be transmitted vertically. Also, 51 percent of adults said that both Hepatitis B and Hepatitis C infection can be vertically transmitted. The fact that piercing and tattooing can transmit hepatitis B infection was known to 45.4 percent of adults. Around 53.4 percent of adults were aware that Hepatitis B and C does not get transmitted by hugging and kissing. Awareness for the risk factors for contracting Hepatitis B and C was found to be in 51.4 percent of adults for Piercing and tattooing, 64 percent of adults for Heterosexuality and 53.2 percent of adults for multiple sexual partners. Nearly one third of the adults (36 percent) were aware that all the three are the risk factors for contracting Hepatitis B and C.

Table 4: Frequency and Percentage of adult by their level of Knowledge regarding prevention of transmission of Hepatitis B and C n=500

Knowledge in Domain 'Prevention of transmission of Hepatitis B and C'	Frequency	Percentage
Awareness regarding:		
Prevention of transmission of Hepatitis B and C		
– Do not share needle	413	82.6
– Avoid getting tattoo	362	72.4
– Do not share personal care items such as toothbrush and razor	385	77.0
– Sharing of food and utensil need not to be avoided	143	28.6
Immunity through Hepatitis B vaccination	172	34.4
Hepatitis B immunization schedule	150	30.0
Primary vaccination of Hepatitis B doses	155	31.0

Table 4 reveals the distribution of adults according to their knowledge regarding prevention of transmission of Hepatitis B and C. Majority 82.6 percent were aware that they should not share needle, 72.4 percent knew that they should avoid tattooing and 77 percent were aware that they should not share personal items like toothbrushes or razor etc. Only 28.6 percent of adults were aware that they do not need to avoid sharing of food and utensils as Hepatitis B does not transmitted by sharing of food and utensils. Out of all the adults, only 34.4 percent knew that Hepatitis B vaccination provides lifelong immunity against Hepatitis B infection. Thirty percent of adults had knowledge regarding Hepatitis B immunization schedule for adults. Similarly, only 31 percent of adults had knowledge regarding primary vaccination doses of Hepatitis B.

Association between knowledge regarding prevention of transmission of Hepatitis B and C with selected demographic variables.

Table 5: Association between knowledge regarding prevention of transmission of Hepatitis B and C with selected demographic variables-types of family among adults using 't' test n=500

Demographic variables	Knowledge Score Mean ± SD	F/t	P
Type of family			
Nuclear family	6.11 ± 3.22	t=2.38	0.01**

The data presented in table 5 shows the findings related to association between knowledge regarding prevention of transmission of Hepatitis B and C with selected demographic variable type of family. However, (t=2.38, p= 0.01*) for Type of family of adults was found to be significant.

Association between knowledge regarding prevention of transmission of Hepatitis B and C with selected risk factors of Hepatitis B and C

Table 6: Association of knowledge regarding prevention of transmission of Hepatitis B and C with selected risk factors among adults using 't' test n=500

Risk Factor	Whether Risk Present or Not	F	Knowledge score Mean ± SD	t	P
History of dental procedures	No	378	35.59±20.01	3.48	0.01**
	Yes	122	43.16±23.47		
History of jaundice	No	446	36.60±20.65	2.54	0.01**
	Yes	54	44.32±23.88		
History of working in hospital/ clinic	No	436	36.65±20.57	2.18	0.02**
	Yes	64	42.81±24.10		
History of handling biomedical waste (BMW) in BMW management unit/ hospital	No	462	36.70±20.70	2.71	0.01**
	Yes	38	46.31±24.40		
Sharing of razors	No	487	37.00±21.00	2.85	0.001***
	Yes	13	53.84±20.26		
Regularly visiting barber shop for shaving	No	378	36.33±21.22	2.07	0.03**
	Yes	122	40.87±20.56		

0.05;**Significant, ***Significant

Table 6 shows that the 't' value and ' p' value for the selected risk factors viz (t= 3.48, p= 0.01**) for History of dental procedures and (t= 2.54, p= 0.01**) for History of jaundice, (t=2.18, p=0.02**) for History of working in hospital/ clinic, (t= 2.71, p=0.01**) for History of handling biomedical waste in biomedical waste management unit/ hospital,(t= 2.85, p= 0.001***) for Sharing of razors, and (t=2.07 , p= 0.03**) for Regularly visiting barber shop for shaving was found significant at the level of 0.05. It can be thus interpreted that there is a significant association between knowledge regarding prevention of transmission of Hepatitis B and C with History of dental procedures and History of jaundice among adults.

Discussion

In the present study it was found that (1.6%) of adults had history of Hepatitis B infection and (18.4%) had history of required emergency treatment and (46.4%) had history of hospitalization and more than half (60.6%) of adults were not immunized for Hepatitis B and (7.4%) had history of

receiving blood transfusion and (24.4%) had history of dental procedures and less (1.2%) had history of haemodialysis and (10%) had history of jaundice and (1.4%) had history of HIV infection and (14.2 %) had history of major surgery and about (1.2%) of adults had history of accidental needle stick respectively. Whereas the study result showed that (1.6 %) of adults family member had history of Hepatitis B Infection and (0.1%) of adults family member had history of Hepatitis C infection and (59.9%%) of adults had history of pierced ears and (18.4%) percent of adults had tattooing and (24.4%) of adults were used to regularly visiting barber shop for shaving and about (2.6%) of adults had history sharing of razors while (4.6%) of adults had history of sex with person of same sex and (3.2%) of adults had history of sex with multiple partners and only (1.0%) of adults used to take injectable drugs/ self-injected for recreational purpose.

Similar findings were seen in the study conducted by Gupta *et al*., (2018), to assess 'Risk factors for Hepatitis C': A clinical study. He reported that approximately (17.6%) of patients had donated blood in the past and (8.1%) patients had a history of blood transfusion and (34.4%) of the adults had their nose/ear piercing. Tattooing was done by (4.1%) of the adults and (43.2%) had history surgical intervention in the past. Majority (85.8%) adults had received dental treatment in the past, 270 (36.5%) were treated. However, he also reported a dissimilar finding that (39.8%) adults were intravenous drug abusers.

Knowledge regarding transmission of Hepatitis B and C

In relation to Knowledge regarding transmission of Hepatitis B and C it was found that (55.8%) of adults were aware that Hepatitis B and C is transmit through contact with infected blood and blood products. Majority (71%) of adults were aware that Hepatitis B and Hepatitis C is transmitted by sharing contaminated injections/needles and (59.2%) said that Hepatitis B and Hepatitis C is transmitted by infected blood transfusion and blood products whereas only (44.8%) replied that Hepatitis B and Hepatitis C is transmitted by Sexual route. It was also noted that 51% of adults said that both Hepatitis B and Hepatitis C can be vertically transmitted.

In a similar study regarding to assess the 'Knowledge of Hepatitis B among healthy population' conducted by Yasobant, Trivedi, Saxena, Puwar, Vora, and Patel, (2017), the study finding revealed that awareness regarding the modes of transmission of Hepatitis B was dissatisfactory as many of participants' believed that Hepatitis B is transmitted by mosquito bite or by feco-oral modes. and (10%) of participants had awareness that blood and blood products, (7.3%) of participant had awareness that needles and sharps, (3.8%) of participants had awareness that unprotected sex are the modes of transmission of Hepatitis B and C and it was concluded that participants knowledge level was very low and dissatisfactory.

Knowledge regarding prevention of transmission of Hepatitis B and C

Majority (82.6%) of adults were aware that they should not share needle and (72.4%) of adults knew that they should avoid tattooing and (77%) were aware that they should not use personal items like toothbrushes or razor etc. Only (28.6%) of adults aware that they do not need to avoid sharing of food and utensils as Hepatitis B does not transmitted by sharing of food and utensils. One third (34.4%) of adults were aware that Hepatitis B vaccination provides the lifelong immunity against Hepatitis infection. However, only (30%) of total adults were aware Hepatitis B immunization schedule i.e. 0, 1 month and 6 months whereas (31%) of total adults had knowledge regarding primary regarding Hepatitis B vaccination.

Similar study conducted to assess the 'Knowledge of Hepatitis B among healthy population' by Yasobant, Trivedi, Saxena, Puwar, Vora, and Patel, (2017), It was found that only 135 (22.5%) people were aware that Hepatitis B vaccination can prevent Hepatitis B transmission. About (24.2%) people have wrong belief that avoiding contaminated water and (20.8%) said that avoiding uncooked food also prevents the transmission of Hepatitis B Virus. Only (6.2%) of people were aware that proper disposal of sharps prevents transmission of Hepatitis B infection, (2.2%) of people knew that avoiding sharing of needles and (2%) knew that avoiding multiple sexual partners will prevent transmission of Hepatitis B infection. Only (36%) people were aware of vaccine against Hepatitis B Virus (HBV). Nearly, (24%) of people were vaccinated against Hepatitis B Virus (HBV) and majority of people were unaware about Hepatitis B vaccination and its schedule. The reason of non-vaccination people found to be lack of awareness (55.1%), lack of awareness of its benefit (15.4%), due to high cost (0.3%), non-availability (1.8%) and fear of side-effects (3%) respectively.

Limitations

The study was conducted only Government Dispensary, Chhattarpur, New Delhi and therefore results of the research are not representative of the entire population of Delhi, India.

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References

1. Aggarwal R, Naik SR. Cost efficacy evaluation of inclusion of hepatitis-B vaccine in expanded programme of immunization. In: Sarin SK, Singhal AK, ed. Hepatitis B in India. CBS Publishers and Distributors, 1996, 206-216.
2. Aijaz Ali, Samina Naeem Khalid, Huma Qureshi. Assessment of Knowledge Regarding Risk Factors of Hepatitis C Virus Transmission and Options to avoid them. International Journal of Collaborative Research on Internal Medicine & Public Health, 2015;7:9.
3. Akmal M, Zulkifle M, Ansari AH. Assessment of Awareness of Hepatitis B Virus Infection in the Patients Attending Nium, Bangalore, India. International Research Journal of Pharmacy. 2015;6(3):210-212. Doi:10.7897/2230-8407.06346
4. Ashraf H, Alam N, Rothermundat C, Brooks A, Bardhan P, Hossain L. Prevalence and risk factors of hepatitis B and C virus infections in an impoverished urban community in Dhaka, Bangladesh. BMC Infectious Diseases. 2010;10(1). Doi: 10.1186/1471-2334-10-208.

5. Baha W, Foullous A, Dersi N. Prevalence and risk factors of hepatitis B and Cvirus infections among the general population and blood donors in Morocco. BMC Public Health. 2013;13:50. https://doi.org/10.1186/1471-2458-13-50
6. Bajubair MA, Elrub AA, Bather G. Hepatic viral infections in Yemen between 2000 2005. Saudi Med J. 2008;29(6):871-874.
7. Bhate P, Saraf N, Parikh P, Ingle M, Phadke A, Sawant P. Cross sectional study of prevalence and risk factors of hepatitis b and hepatitis c infection in a rural village of India. Arquivos De Gastroenterologia. 2015;52(4):321-324. doi:10.1590/s0004 28032015000400013
8. Bhosale S, Tripathi S, Fernandez K. Knowledge attitude and practices regarding hepatitis ′B′ among class IV hospital workers of tertiary care teaching hospital in Pune, India, 2020.
9. Garg H, Sarin S, Kumar M, Garg V, Sharma B, Kumar A. Tenofovir improves the outcome in patients with spontaneous reactivation of hepatitis B presenting as acute-on-chronic liver failure. Hepatology. 2011;53(3):774-780. Doi: 10.1002/hep.24109
10. Giri M, Panda J, Sahoo A. Hepatitis B awareness and vaccination status first year medical students. International Journal of Community Medicine and Public Health, 2016, 530-532. doi:10.18203/2394-6040.ijcmph 20160445
11. Global health sector strategy on viral hepatitis, 2016-2021.