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RESEARCH ARTICLE

HEPATITIS B KNOWLEDGE AND PREVENTIVE PRACTICES AMONGST MEDICAL STUDENTS IN A TERTIARY INSTITUTION IN ABIA STATE, SOUTH-EAST NIGERIA

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Abstract

Background: Hepatitis B virus infection is a life-threatening communicable disease of public health importance. Risk factors in the transmission of Hepatitis B are from exposures to infected blood and body fluids. Medical students in training are at risk of contracting the disease during clinical rotations in the hospital. This study was therefore conducted to determine the knowledge and practice level of HBV among medical students in Abia state.

Methods: This was a descriptive cross-sectional study conducted to assess the knowledge and practice of prevention of hepatitis B infection among undergraduate medical students in Abia State University, Uturu. A total of 395 students participated in the study. Data was collected using a self-administered questionnaire. Good knowledge was awarded for 70% of correct answers and poor knowledge for less than 70% correct answers. Data was analysed using SPSS version 21.0.

Results: Generally, most of the students had adequate knowledge of Hepatitis B infection. Two hundred and ninety-nine (75.7%) respondents had a score of 70% and above. Regarding vaccination status, 145 (36.7%) had received HBV vaccine, 83 (21%) hadn't while 167 (42.3%) didn't know their vaccination status. Students in year 5 [136 (87.2%)] had the highest knowledge score followed by students in year 4 [122 (70.5%)]. There was a statistical significant association between knowledge score of HBV and year of study.

Conclusions: This study showed that there was high knowledge of HBV infection among the students but low practice level on measures to prevent spread of HBV infection.

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Introduction:-

Hepatitis B infection is a disease of the liver caused by Hepatitis B virus (HBV). Hepatitis B infection is highly contagious commonly spread by exposure to infected blood and body fluids. Person to person transmission of viral hepatitis is propagated when infected sharp objects are shared between people, having unprotected sexual intercourse with an infected person and mother to child transmission. Health workers are at risk of hepatitis infection due to regularly handling of patients' body fluids. High level of standard precautions in patients' care is required by medical professionals for protection against hepatitis. Worldwide, approximately 240million people have chronic hepatitis B infection projected to remain high for the next 40-50 years without accelerated and expanded response (1). Viral hepatitis is responsible for an estimated 1.4million deaths per year from acute infection and hepatitis-

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related liver cancer and cirrhosis. Death toll is increased in co-morbid states. About 2.6million people living with HIV are co-infected with hepatitis B virus (2). In Nigeria, a study carried out in Kano state found that among 440 HIV positive patients, 12.3% were co-positive for HBV (3). Viral hepatitis is a growing cause of mortality among people living with HIV.

Prevalence of Hepatitis B is highest in Sub-saharan Africa and east Asia where between 5-10% of the adult population is chronically infected (1). An estimated 3.3%, 2.0% and 1.6% of adult population are infected with Hepatitis B in WHO Eastern Mediterranean Region, the WHO South –east Asia and the WHO European Region respectively. Mother to child transmission is the commonest mode of transmission in areas with high prevalence of Hepatitis B. Hepatitis B chronicity is developed in infants infected before the age of 5 years in about 95% of cases while infection in adulthood leading to chronicity occurs in less than 5%. Hepatitis B virus is very contagious. It can survive outside the body for at least 7 days. During this time, the virus can still cause infection if it enters the body of a person who is not protected. The incubation period of the hepatitis B virus is 75days but can vary from 30 to 180 days (4). The virus can be detected within 30-60 days after infection and can persist and develop into chronic hepatitis B. Chronic infection with hepatitis B may persist in the liver for lifetime (5), which can lead to HBV complications such as cirrhosis and hepatocellular carcinoma (6). The risk of developing liver-related complications from Hepatitis B infection increases as patient progresses from acute to chronic stage of the infection. Most HBV infections end up at the acute phase with about 10% progressing to the chronic phase. An estimated 44% cases of liver cirrhosis and 47% of hepatocellular carcinoma in Sub-saharan Africa are attributed to HBV (7).

Infection with hepatitis B virus among health care workers is two to four times higher than that of the general population (8). Risk in the health care setting arise from percutaneous and mucosal exposure to infected blood or body fluids (9). It is thus an occupational health hazard for health care practitioners (10-11). In Nigeria, a national survey of hepatitis showed a prevalence of 12.2% in the general population (12) and 17% among health professionals in a study conducted in south-south, Nigeria (13). An Ethiopian study found that 7.3% of health care workers (HCWs) were infected with HBV while only 0.9% of non-HCWs who participated in the study were infected. (14) High rates of transmission in health care facilities have been attributed to the practice of modern medicine. Lapses in sterilisation and improper waste disposal may create a variety of health risks from HBV infection (15). Re-use of needles and sharps, non-use of gloves, goggles, face masks and boots, are some practices that could expose a health worker to HBV. (16,17) Prevention of HBV infection is by the use of vaccines which is the mainstay and adherence to standard precautions while working in high risk environments (18). The complete dose of hepatitis B vaccine protects up to 95% of infants, children and young adults (19). Protection lasts at least 20 years and probably lifelong. Practices such as frequent handwashing, wearing of gloves, wearing of goggles, wearing of boots, cleaning of work surfaces and wearing of aprons are standard precautions that should be observed by every health worker to protect against HBV infection in health care settings. Adequate knowledge translated to right practices is needed to prevent the spread of viral hepatitis B amongst health workers.

Medical students are undergraduates in training to becoming medical doctors. During the course of training, they are expected to work closely with their supervisors to acquire the skills and knowledge for practice as doctors when they graduate. They are exposed to seemingly same level of risks as other health professionals as they are expected to assist in patients' care. Thus, there is need for medical students to be equipped adequately on practices to protect them from contracting HBV. This study was therefore carried out amongst medical students to ascertain their knowledge of hepatitis B infection and level of preventive practices against Hepatitis B virus infection.

Material And Methods:-

Study Area

This study was conducted at the college of medicine, Abia State University Uturu, Abia State, Nigeria. The medical college is under the faculty of Medicine and health sciences. It is the only state-owned medical school and the oldest state owned medical college in Nigeria. It trains her students at the Abia State University Teaching Hospital (ABSUTH) located in Aba, Abia state. Other departments under the college of medicine and health sciences are nursing and laboratory sciences. Students in the college of medicine receive 6 years training divided into 3 years of pre-clinical and 3 years of clinical. At the end of the training, they are awarded the degree of Bachelor of Medicine and Bachelor of Surgery. They have one year of internship after graduation before granting full licence to practice as medical doctors.

Study Population

The study population was students of the college of medicine in Abia State University, Uturu. It included both pre-clinical and clinical students.

Study design and period

This was a cross-sectional study conducted to assess the knowledge and practices of undergraduate medical students towards the prevention of hepatitis B infection. Data was collected on the 27th July, 2019 marking the World Hepatitis day.

Sample size determination

Single population proportion formula was used to calculate the sample size. Using an assumption of 50% proportion on knowledge of hepatitis amongst medical students, the formula was substituted based on 95% confidence interval ($Z=1.96$), and 5% error margin.

$$\begin{aligned} \text{Therefore } n &= Z^2 p(1-P)/d^2 \\ &= (1.96^2) \times 0.5(1-0.5)/0.05^2 = 384 \end{aligned}$$

Assuming a 10% non-response, 38 questionnaires were added for additional 38 students taking the total study population to 422. However, only **395** students attended the one-day workshop to mark the 'World Hepatitis day 2019'.

Data Collection

Data was collected using a self-administered questionnaire. Information on socio-demographic characteristics of respondents, knowledge of Hepatitis and practices to prevent the spread of Hepatitis B virus. Knowledge and practice on Hepatitis B infection were considered dependent variables; and age, sex and year of study as independent variables. Knowledge and practices regarding Hepatitis B were assessed objectively and assigned scores for good or bad knowledge and right or wrong practices. Good knowledge was awarded for 70% of correct answers and poor for less than 70% correct answers. Right practices were given for 70% correct practice answers and wrong practices for less than 70% correct practice answers.

All the students who attended the one-day sensitization and awareness campaign to mark the World Hepatitis day 2019 were included in the study.

Data Analysis

Data collected was analysed using SPSS software version 21.0. Data was presented in frequency tables. Inferential statistics was used to test association between categorical variables. P-value of <0.05 was taken to be statistically significant.

Ethical clearance

Ethical clearance for the study was obtained from the research and ethics committee of Abia State University Teaching Hospital. The aim and objectives of the study was explained to the participants and informed consent obtained before commencement of study.

Results:-

A total of 395 undergraduate medical students participated in the study giving a response rate of 100%.

Table 1 shows socio-demographic characteristics of respondents. The majority of the students 249 (63%) were in the age group of 21-24 years and males 207 (52.4%). Most of the students 173 (43.8%) were in their 4th year of study.

Table 2 shows the knowledge of Hepatitis B among the respondents. Generally, most of the students had adequate knowledge of Hepatitis B infection. Two hundred and seven (52.4%) students knew that hepatitis B infection is caused by a blood-borne pathogen. Two hundred and ninety-five (74.7%) students knew that Hepatitis B virus belongs to the Hepadnaviridae group. Regarding transmission of Hepatitis B virus, 160 (40.5%) knew it could be transmitted sexually and 288 (72.9%) agreed it could be transmitted by sharing infected sharp objects. Majority of the respondents 291 (73.7%) knew that vaccines protect against Hepatitis B virus. In terms of knowledge of Hepatitis B virus infection causing liver cancer, 301 (77.2%) were aware that HBV causes liver cancer. Regarding possibility of HBV been curable, 215 (54.4%) knew that it can be cured/treated.

Knowledge score of the respondents is shown in table 3. Two hundred and ninety-nine (75.7%) respondents had a score of 70% and above and so classified a good knowledge score.

Table 4 shows HBV prevention practices among the respondents. Of the 395 students interviewed, 233(60%) did not share sharps, 241 (61%) always wore gloves while attending to patients and 280 (70.9%) used condoms during sex. Regarding vaccination status, 145 (36.7%) had received HBV vaccine, 83 (21%) hadn't while 167 (42.3%) didn't know their vaccination status.

Table 5 shows association between knowledge of HBV infection and year of study. Students in their year 5 had the highest 136 (87.2%) knowledge score followed by students in year 4 [122 (70.5%)]. There was a statistical significant association between knowledge score of HBV and year of study.

Table 6 shows association between HBV prevention practices and year of study. Most of the students in year 4 ; 128 (74%) had wrong preventive practices against HBV. There was a statistical significant difference between prevention practices of HBV and year of study.

Table 7 shows association between knowledge of HBV and preventive practices among respondents. There was a statistical significant difference between knowledge and practice of prevention measures against HBV. One hundred and ninety-one (63.9%) students who had good knowledge of HBV had wrong practices.

Table 1:- Social demographic characteristics of respondents.

Variable	Frequency	Percentage (%)
Age (years)		
< 20	9	2.3
21-24	249	63.0
25-28	93	23.5
> 28	44	11.1
Total	395	100.0
Sex		
Male	207	52.4
Female	188	47.6
Total	395	100.0
Year of study		
3	17	4.3
4	173	43.8
5	156	39.5
6	49	12.4
Total	395	100.0

Table 2:- Knowledge of Hepatitis B among respondents.

Variable (Questions)	Frequency	Percentage (%)
Hepatitis B is caused by a blood - borne Pathogen	N= 395	
Yes	207	52.4
No	188	47.6
Hepatitis B belong to the family Hepadnavindae		
Yes	295	74.4
No	100	25.3
It can be transmitted through sexual intercourse		
Yes	160	40.5
No	235	59.5
It can be transmitted by sharing sharp objects		

Yes	288	72.9
No	107	27.1
Vaccine can be protected against Hepatitis B		
Yes	291	73.7
No	104	26.3
Hepatitis B causes liver cancer		
Yes	305	77.2
No	78	19.7
I don't know	12	3.1
Hepatitis B can be cured/treated		
Yes	215	54.4
No	102	25.8
I don't know	78	19.8

Table 3:- knowledge score of respondents regarding Hepatitis B.

Score	Frequency	Percentage (%)
Good (>15/20)	299	75.7
Poor (< 15/20)	96	24.3
Total	395	100.0

Table 4:- Hepatitis B prevention practices among respondents.

Variable	Frequency	Percentage (%)
Sharing of sharps	N = 395	
Yes (always)	14	3.5
No	233	60.0
Sometimes	103	26.1
No response	45	10.4
Use of hand gloves while attending to patients		
Always	241	61.0
Sometimes	134	34.0
No	20	5.1
Use of condom during sex		
Always	280	70.9
Sometimes	32	8.1
Never	83	21.0
Vaccination status		
Yes	145	36.7
No	83	21.0
I don't know	167	42.3

Table 5:- Association in between knowledge of Hepatitis B and year of study.

Year of study	Knowledge	Score	Total	X2/P-value
	Good (%)	Poor(%)		
3	9(52.9)	8(47.1)	17	
4	122(70.5)	51(29.5)	173	X2= 21.361
5	136(87.2)	20(12.8)	156	P value =0.000
6	32(69.6)	17(30.5)	49	
Total	299(75.9)	96(24.3)	395(100)	

Table 6:- Association between prevention practices and year of study.

Year of study	Knowledge	Score	Total	X2/ P value
	Right (%)	Wrong (%)		

3	1164.7)	6(35.3)	17	
4	45(26.0)	128(74.0)	173	X ² =17.168
5	51(32.7)	105(67.3)	156	P value = 0.001
6	24(49.0)	25(51.0)	49	
Total	131(33.2)	264(66.8)	395(100)	

Table 7:- Association between knowledge of Hepatitis B and preventive practices among respondents.

Knowledge score	Preventive practices		Total	X ² / P- value
	Right (%)	Wrong(%)		
Good	108(36.1)	191(63.9)	299	X ² = 4.849
Poor	23(24.0)	73(76.0)	96	P-value
Total	131(33.2)	264(66.8)	395(100)	0.028

Discussion:-

Health care professionals at any level are regularly exposed to blood and body fluids while attending to patients. Splashes, spills and pricks are high risk avenues for contact with blood and body fluids which might be infected with blood-borne pathogens such as the HBV. It is therefore necessary to ascertain the level of awareness and preventive measures practiced regarding HBV. In this study, 75.7% of the respondents had good knowledge of HBV infection. The result is similar to a study carried out in Lagos state, Nigeria (20) but lower than a study conducted in Ebonyi state Nigeria where 80.7% of the respondents had good knowledge(21). Most of the respondents in this study were aware that Hepatitis B virus belonged to the family of Hepadnaviridae, can be transmitted by sharing sharp and can cause liver cancer. This finding is consistent with an Ethiopian study (22) and a previous study in Cameroun (23). Lower proportion of the students in this study knew that HBV was transmitted through sexual contact and can be cured or treated. This is worrisome and a need for increased awareness and education on dangers of indulging in unprotected sex as a low knowledge might lead to unhealthy practices and exposure to risk of contracting HBV. A high proportion of the students in this study were aware that HBV infection can be prevented through vaccination. This is similar to studies carried out in Saudi Arabia (24) and India (25). Vaccines are biological preparation that provides active acquired immunity to a particular infectious disease (26). Vaccines have proven effective in reducing morbidity and mortality from infectious diseases including HBV infection (26). Risky practices were seen among respondents in this study. Sharing of sharps was prevalent among the students. Exposure to blood and infected body fluids is high during sharing of sharps among person. This was reported in a study conducted in Palestine (27). Accidental splashes in hospitals are common ways health workers contract HBV. Regarding vaccination status of respondents, low proportion of students knew their vaccination status while a higher proportion did not know if they had been vaccinated against HBV infection. This finding are comparable with a previous study done in Port-Harcourt, Nigeria (28). The low uptake of HBV vaccine seen in this study might be related to unavailability of the vaccines at the time they were meant to be received during infancy. Majority of the respondents in this study were born before Nigeria commenced Hepatitis B vaccination in 2004 (29). This finding therefore strengthens the need to promote HBV vaccination programmes in Nigeria for persons at risk and those born prior to commencement of HBV vaccination in Nigeria.

This present study shows a strong relationship between knowledge and practice of HBV infection. The high proportion of students with good knowledge of HBV infection did not reflect in the practice level as this study showed low practice in the prevention of HBV infection among the respondents. This gap in knowledge and practice was also demonstrated according to the year of study. Students in the lower class had lower knowledge and practice regarding Hepatitis B virus infection. This finding is similar to previous studies conducted in Iran and India (30,31). The gap in knowledge and practice is an indication for close monitoring of undergraduate medical students while attending to patients in the hospital. It has been shown that adequate knowledge can lead to right practices of measures against Hepatitis B. This finding was reported in a study carried out in Pakistan where a positive correlation between knowledge-attitude, knowledge-practice and attitude-practice (32).

Study limitations

Results on prevention measures against HBV were based on self-reporting as against an objective assessment by observing the students while attending to the patients. Also this is a cross-sectional study, thus does not show cause and effect relationship.

Recommendations:-

The following recommendations have been made based on the results of this study

1. Strengthen supervision of medical students during their rotations.
2. Implement a policy for compulsory vaccination of medical students who haven't received HBV vaccines prior to admission into medical school.
3. Vaccines should be made available and accessible to students.
4. Regular training and re-training of medical students on prevention of HBV infection

Conclusions:-

This study showed a low practice for measures to prevent the spread of Hepatitis B infection among medical students. Though the knowledge level was high but did not yield the expected practice level. Most of the students did not know their vaccination status. The above recommendations are therefore necessary for implementation to increase the knowledge and practice level in the prevention of HBV infection among medical students.

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Author Contribution

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Conflict of interest

None.

References:-

1. World Health Organisation (WHO). Prevention and Control of Viral Hepatitis Infection: Framework for Global Action, see <http://www.who.int/hiv/pub/hepatitis/Framework/en/> accessed 9th April 2021.
2. World Health Organisation (WHO). Global Burden of Disease and WHO/UNAIDS estimates. See <http://ihmeuw.org/3pmt> accessed 9th April 2021
3. Hamza M, Samaila AA, Yakassai AM, Musa B, Musa MB, Abdulrazaq GH. Prevalence of Hepatitis B and C virus infections among HIV-infections in a tertiary hospital in North-Western Nigeria. Niger J Basic ClinSci2013;10:76-81.
4. James A Ndako, Obinna ON, Georgebest ON, Echeonwu SAJ, Onyeka A, et al (2012). Studies on prevalence and risk factors for Hepatitis B surface antigen among secondary school students in North-central, Nigeria, Sierra Leona. Journal of Biomedical Research 3(3):163-168.
5. Jia JD, Zhuang H (2007). A winning war against Hepatitis B virus infection in China. Chin Med J (Engl) 120 (24) : 2157-2158
6. Zou SI, Zhang J, Tepper M, Giulivi A, Baptiste B (2001). Enhanced surveillance of acute Hepatitis B and acute Hepatitis C in four health regions in Canada, 1998 to 1999. Can J Infect Dis 12(6):351-356
7. Perz JF, Armstrong GL, Farrington LA, Hutin YJ, Bell BP. The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide. J Hepatol2006;45:529-38
8. Singhal V, Bora D, Singh S. Hepatitis B in health care workers. Indian scenario. J Lab Physicians, 2009;1:41-8
9. Hadler SC. Hepatitis B virus infection and health care workers. Vaccine. 1990;8(Suppl 1): S24-8
10. Sofola OO, Folayan MO, Denloye OO, Okeigbemen SA. Occupational exposure to bloodborne pathogens and management of exposure incidents in Nigeria and dental schools. J Dent Edu.2007;71:832-837
11. Bhattarai S, KC S, Pradhan PM, Lama S, Rijal S. hepatitis B vaccination and needle-stick and sharps-related injuries among medical school students in Nepal: a cross-sectional study. BMC Res Notes 2014;7:774
12. Olayinka AT, Oyemakinde A, Balogun MS, Ajudua A, Nguku P, Aderinola M, et al. seroprevalence of hepatitis B infection in Nigeria: a national survey. Am J Trop Med Hyg. 2016;95(4):902-7
13. Ndako JA, Onwuliri EA, AdelaniAkande T, Olaolu DT, Dahunsi SO, et al (2014). Screening for Hepatitis B surface antigen (Hbsag) among health care workers in an urban community South, South Nigeria. IJBPAS 3(3):415-425.

14. Geberemichael A, Gelaw A, Moges F, Dagne M. Seroprevalence of hepatitis B virus infections among health care workers at the Bulle Hora Woreda Government Health Institutions, Southern Oromia, Ethiopia. *J Environ Occup Sci.* 2013;2(1):9-14.
15. **Nduka I**, Ndimele E.I., Anya N.K.U., Okunamiri S.C. (2012). The knowledge and practice of Universal Basic Precautions among health workers in Abia State University Teaching Hospital, Aba, Abia State. *ABSUMSAJ.* 7:17-21.
16. Pruss-Ustun A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health care workers. *Am J Ind Med.* 2005;48(6):482-90.
17. Taneja N, Biswal M. Safe disposal of infectious waste. Indian perspective. *J Hosp Infect.* 2009;62(4):525-6.
18. NdukaIjeoma, Nduka EC, Aguwa E. Training on Universal Basic Precautions and Provision of Personal Protective Equipment: Effect on Prevention of Transmission of HIV in Hospital Setting. *Gazette of Medicine.* 1(1):41-49.
19. GAVI Alliance. Country Tailored Approach for Nigeria 2014-2018;2014. Available from: http://www.apps.who.int/immunisation_monitoring/globalsummary/estimates. Accessed 9th April 2021.
20. Abiola AO, Omoyeni OE, Akodu BA. Knowledge, attitude and practice of hepatitis B vaccination among health workers at the Lagos state accident and emergency centre, Toll-Gate, Alausa, Lagos State. *West Afr J Med.* 2013 Oct-Dec;32(4):257-62.
21. N.C.Eze, E.C. Egba, J.E. Ogbanna, S.N. Nwamini, P.U.Nweke, J.S. Amasianya. Knowledge, Attitude and Uptake of Hepatitis B vaccine among clinical medical students of a Tertiary institution in Southeast Nigeria. *Asian J of Immunology* 2020;4(2):31-36.
22. Abdnur A, Berhanu W, Kassahun H, Biniam M, Tekalign D. Assessment of knowledge, attitudes and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. *BMC Research Notes* 2016;9:410. DOI 10.1186/s13104-016-2216-y
23. Noubiap JJ, Nansseu JR, Kengne KK, Ndoula ST, Agyingi LA. Occupational exposure to blood, hepatitis B vaccine knowledge and uptake among medical students in Cameroon. *BMC Med Educ.* 2013;13:148.
24. ReangT,Chakraborty T, Sarker M, Tripura A. A study of knowledge and practice regarding Hepatitis B among nursing students attending tertiary care hospitals in Agartala city. *International Journal of Research in Medical Sciences* 215;3(7):1641-9
25. Singh A, Jain S. prevention of Hepatitis B-knowledge and practices among medical students. *BMC* 2012;(2):52-6.
26. World Health Organisation, Global Vaccine Action Plan 2011-2020. From :http://www.who.int/immunisation_monitoring/data/en/ accessed 15 April 2021.
27. Al-Dabbas M, Abu-Rmeileh NM. Needle stick injury among interns and medical students in the occupied Palestine territory. *East Mediterr Health J.* 2012;18(7):700-6
28. Paul N, Peterside O. hepatitis B vaccination rate among medical students at the University of Port-Harcourt Teaching Hospital (UPTH). *World Journal of Vaccines* 2015;(2):1-7
29. World Health Organisation. Vaccine preventable disease monitoring system, 2005 Global summary on immunisation profile in Nigeria. Available at http://www.who.int/vaccines/global_summary/immunization/countryprofileresult.cfm. accessed 15 April, 2021.
30. HamidrezaKarima-Sari, Bayatpoor ME, AftabiKhotbesara M, Sattari Z, Sattari P, Taheri H et al. Knowledge, attitude, and practice of Iranian health sciences students regarding hepatitis B and C virus infections: A national survey. *Am J Infect Control.* 2017 Nov 1;45 (11).
31. AkankashaRathi. Vikas Kumar, JitendraMajhi, Shalini Jain, Panna Lai, Salyavir Singh. Assessment of knowledge, attitude, and practices toward prevention of hepatitis B infection among medical students in a high-risk setting of a newly established medical institution. *J Lab Physicians,* 2018 Oct-Dec;10(4):374-379.
32. Noman ulHaq, Mohamed AzmiHassali, HishamAljadhey. A cross sectional assessment of knowledge, attitude and practice towards Hepatitis B among healthy population of Quetta, Pakistan. *BMC Public Health,* 2012;12:692.