Section: Community Medicine

Original Research Article

HEPATITIS B EXPOSURE, VACCINATION AND ITS AWARENESS, ATTITUDE AND PRACTICE AMONG HEALTHCARE PROFESSIONALS OF TERTIARY CARE HOSPITAL OF SOUTH GUJARAT: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Hepatitis B Virus (HBV) infection is a global public health issue, remarking as occupation hazard which is preventable on vaccination. The objective is to determine the exposure to potentially infectious bodily fluids, Hepatitis B vaccination coverage, compliance to vaccination schedule and to assess the Knowledge, Attitude and Practice (KAP) among Healthcare Professionals.

Materials and Methods: A cross sectional study
l study was conducted following desk review among 419 healthcare professionals of medical college and tertiary care hospital Surat during April 2022 to May 2022 by using semi-structured questionnaire.

Results: Out of 419 participants, 9 participants were not at all aware about Hepatitis B infection, their risk and prevention on vaccination, were excluded from analysis. Among remaining 410 participants, less than half (43.7%) were fully vaccinated. About 91.2%, 89.98% and 58.47% had good knowledge, positive attitude and good practice towards HBV respectively. Almost one third healthcare workers (31.83%) had met needle stick injury during their practices.

Conclusion: Risk of contracting Hepatitis B infection is higher among healthcare professionals as one third of them have met needle stick injury in their working life. Compliance to current Hepatitis B Immunization is poor as less than half is fully vaccinated despite of good knowledge and positive attitude.

Keywords: Healthcare Professionals, Hepatitis B, KAP, Occupational hazard, Vaccination.

INTRODUCTION

Globally WHO apprises those 296 million individuals who were living with ongoing hepatitis B disease in 2019, with 1.5 million new infections every year. In 2019, hepatitis B brought about expected 8,20,000 deaths, for the most part from cirrhosis and hepatocellular carcinoma.[1] In India, prevalence of hepatitis B surface antigen (HBsAg) is 3- 4.2% with over 40 million HBV carriers. Every year over 1,15,000 Indians die of hepatitis B related complications.[2] Countries have been divided into high, intermediate and low groups according to Hepatitis B endemicity. India falls in the intermediate endemicity zone (prevalence of 2–7%, with an average of 4%), with disease burden of about 50 million which is the second biggest worldwide pool of chronic Hepatitis B infections.[3]

Hepatitis B Virus (HBV) infection is significant global public health problem, HCW and medical students in developing countries including India are at increased risk of contracting HBV infection.[4] The prevalence rate of HBV in HCWs is about 2–10 times higher than the general populations in the world.[5]

HCWs and medical students are at an increased risk of contracting HBV in the workplace due to occupational exposure to blood and body fluid during their clinical attachments.[6] The average risk of getting HBV disease after percutaneous exposure to infected blood has been assessed to be 6-30%; while it is around 0.3% for human immunodeficiency infection.[7]

Hepatitis B is not only the most transmissible infection, but also only one that is preventable by vaccination which provides more than 90% protection.[4] In developing countries, 40-65% of HBV infections in HCW were attributable to percutaneous occupational exposure. By contrast, in developed countries, the attributable fraction for HBV was less than 10%, largely because of immunization and post-exposure prophylaxis.[8]

High prevalence of HBV in developing countries substantially increases the risk of occupational exposure while vaccination coverage is poor.

Objectives: This study aimed to assess occupational exposure, HBV vaccination coverage, compliance to vaccination schedule and associated factors, level of knowledge, attitudes, and practices (KAP) towards HBV among healthcare professionals of medical college and tertiary care hospital Surat.

MATERIALS AND METHODS

Routine Hepatitis B adult vaccination is running at injection room of trauma centre of tertiary care hospital Surat where all the healthcare professionals of tertiary care hospital receive Hepatitis B vaccination free of cost.

Desk review was done for the data available in Hepatitis B Immunization register from Injection room of Trauma centre of tertiary care Hospital Surat from 1st of January 2020 to 31st of December 2021. Participants were recruited based on whose vaccination schedule was not due till 31st of December 2021. Total 567 healthcare professionals were included in analysis.

Based on results of this secondary data analysis, a separate cross-sectional study was planned and conducted among healthcare professionals working or studying at medical college and/or tertiary care hospital Surat during April 2022 to May 2022, after taking ethical clearance from institutional ethics committee (Reference No. GMCS/STU/ETHICS/Approval/9800/22). Sample size was calculated based on 5.9% Exposure rate among HCW 8 by using open epi software which was 336 at 99.99% confidence interval.

Total healthcare professionals working or studying at medical college and/or tertiary care hospital Surat as per record section is 2979 (Medical staff- 289, Undergraduate (UG- Medical students/Interns) /Postgraduate (PG)- 1456, Nursing staff- 760, Paramedic students- 240, Class-4- 177 and Class-3/Paramedic staff/Lab technician- 57). Participants were selected from different cadres proportionally as per their strength. Sample size was 336 but total 422 people who were at risk of being exposed (based on their clinical attachment practices) were contacted purposively, out of which 3 rejected from participating in the study. On considering, 419 participants (UG students- 147, PG students- 39, Paramedic students- 43, Medical staff- 36, Nursing staff- 124, Class 3/Paramedic staff/Lab technician- 7 and Class 4- 23) had given the consent to participate out of which all the UG students, interns, PG students and medical staff were asked to fill google form, while nursing staff and paramedic staff were asked to fill physical form and all class 4 workers were interviewed one on one. A semi-structured, pre-designed and pre tested questionnaire containing 12 questions of knowledge, 6 questions of attitude and 6 questions of practice had been used for the data collection. The questionnaire was shared in form of either Google form or in hard copy as per participants' choice. Questionnaire was self-administered after explaining about the study ensuring voluntary participation. Researcher also dictated the questions during the data collection period for higher reliability and ease of understanding of participants. One on one interviews were conducted for Class 4 staff specially as considering their low education level. Ethical approval was obtained from the Human Resource Ethics Committee, Government Medical College, Surat, Gujarat. Informed written consent of the participants was obtained after explaining the contents of the participant information sheet to them in a language they understand and comprehend. The participants were ensured about maintenance of confidentiality by not taking any identifiers and cumulatively presenting the data. Sensitization sessions were conducted after the data collection. All the data was entered in MS Excel and analyzed using MS Excel and SPSS software version 23. All the answers for knowledge, attitude and practice were scored 0 for incorrect answers and 1 for correct answers. Out of 419 participants, 9 participants found who were not aware about Hepatitis B at all, excluded from the analysis.

Operational definitions: Vaccination status was categorized into full-dose vaccination (received three doses of HBV vaccine), not fully vaccinated (took one/two doses of HBV vaccine), and not vaccinated (not received any dose of HBV vaccine).

"Good knowledge": if the respondents were able to answer 70% or more of knowledge questions correctly.

"Positive attitude": if the respondents were able to answer 70% or more of attitude questions correctly.

"Good practice": if the respondents were able to answer 70% or more of practice questions correctly.[4]

RESULTS

Secondary data: On analyzing secondary data, total 567 (UG students- 280, PG students- 56, Paramedic students- 79, Medical staff- 2, Nursing staff- 15,

Class 3- 49 and Class 4- 16, Others- 70) beneficiaries were found to be availed Hepatitis B vaccination at tertiary care hospital of Surat, out of which three fourth (72%) were found not to be completely vaccinated. Mean age was 22.76 + 7.03 years. Male: Female ratio was almost 1(54:46). More than half (61%) were living on the hospital campus only.

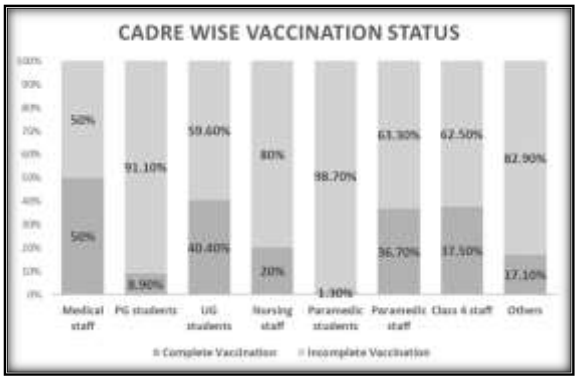

Figure 1: Cadre wise vaccination status among healthcare professionals (n=567)

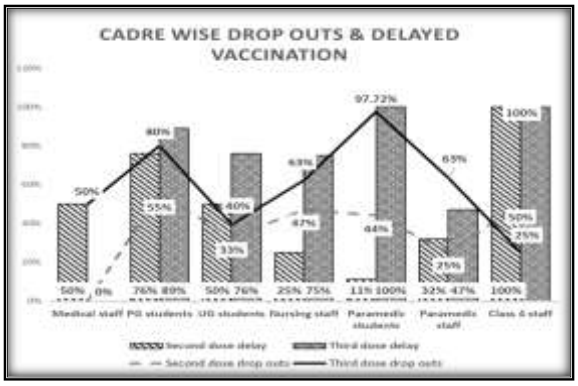

Figure 2: Cadre wise dropout rate and delayed vaccination among healthcare professionals (n=567)

Out of 567, 231 (40.74%) dropped the second dose and 336 had taken second dose out of which 43.75% had not taken it on the time. Same way out of 336, 52.68% dropped the third dose and only 159 had received third dose. All most three fourth (71.69%) of vaccinated participants had shown delayed vaccination.

Paramedic students had 0.13 lower odds of being completely vaccinated (p value = <0.01 with 95% CI (0.001-0.385).

Primary Data: Vaccination coverage among participants in primary data was found to be less than half (43.7%) only and 157 (38.3%) had been partially vaccinated. Mean age of participants was 27.39 + 9.2 years. Proportion of females was 64.1%. On categorizing the participants on basis of duration of experience, it was 0-1 year (11.5%), 2-5 years (53.7%), 5-10 years (12.9%), 11-20 years (10.2%), >20 (11.7%). Most of them (80.5%) were residing in urban area only.

Almost one fifth (18%) HCW did not take even single dose of Hep B vaccine.

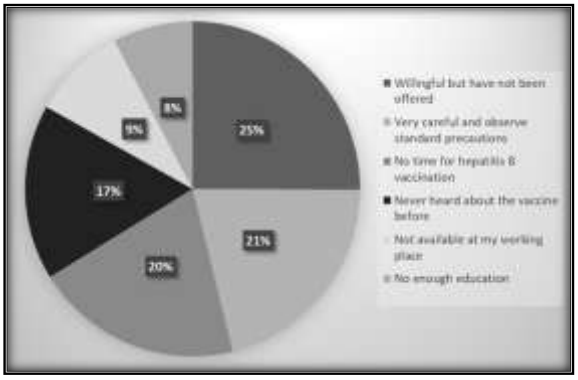

Figure 3: Reasons for not availing Hepatitis B vaccination among healthcare professionals (n=77)

Table 1: Factors associated with full-dose vaccination status among study participants (n=410)

Variable	Categories	Full dose vaccination n (%)		COR(95% CI)	p value	AOR (95% CI)	p value
		Yes	No				
Age Group	≤27	107 (38.1%)	174 (61.9%)	1		1	
	>27	72 (55.8%)	57 (44.2%)	2.023 (1.344 - 3.046)	0.001	0.865 (0.424 - 1.764)	0.69
Gender	Male	50 (34%)	97 (66%)	1		1	
	Female	129 (49%)	134 (51%)	1.868 (1.229 - 2.837)	0.003	1.760 (1.046 - 2.960)	0.033
Cadre	UG students	49 (33.3%)	98 (66.7%)	1		1	
	PG students	25 (64.1%)	14 (35.9%)	3.571 (1.706 - 7.476)	0.001	2.902 (1.177 - 7.154)	0.021
	Medical staff	18 (50%)	18 (50%)	2 (0.956 - 4.183)	0.066	1.820 (0.678 - 4.888)	0.235
	Nursing staff	73 (59.8%)	49 (40.2%)	2.98 (1.810 - 4.906)	<0.001	2.070 (0.979 - 4.376)	0.057
	Paramedic students	10 (23.3%)	33 (76.7%)	0.606 (0.276 - 1.330)	0.212	0.428 (0.174 - 1.050)	0.064
	Paramedic staff/ Lab technicians	2 (33.3%)	4 (66.7%)	1	1	1.079 (0.168 - 6.937)	0.936
	Class 4 workers/ Servants	2 (11.8%)	15 (88.2%)	0.267 (0.059 - 1.213)	0.087	0.562 (0.097 - 3.261)	0.521
Experience	0-1	16 (34%)	31 (66%)	1		1	
	2-5	87 (39.5%)	133 (60.5%)	1.267 (0.654 - 2.455)	0.482	1.393 (0.618 - 3.139)	0.424
	5-10	25 (47.2%)	28 (52.8%)	1.73 (0.770 - 3.886)	0.184	1.142 (0.436 - 2.993)	0.786

	11-20	23 (54.8%)	19 (45.2%)	2.345 (0.996 - 5.522)	0.051	2.238 (0.792 - 6.325)	0.129
	>20	28 (58.3%)	20 (41.7%)	2.712 (1.180 - 6.237)	0.019	1.828 (0.651 - 5.132)	0.252
Residence	Rural	30 (37.5%)	50 (62.5%)	1		1	
	Urban	149 (45.2%)	181 (54.8%)	1.372 (0.831 - 2.266)	0.217	1.550 (0.852 - 2.820)	0.151
Knowledge	Poor	5 (17.9%)	23 (82.1%)	1		1	
	Good	174 (45.5%)	208 (54.5%)	3.848 (1.433 - 10.33)	0.008	3.289 (1.053 - 10.27)	0.04
Attitude	Negative	10 (30.3%)	23 (69.7%)	1		1	
	Positive	169 (44.8%)	208 (55.2%)	1.869 (0.866 - 4.035)	0.111	1.496 (0.624 - 3.586)	0.367
Practice	Poor	45 (27.3%)	120 (72.7%)	1		1	
	Good	134 (54.7%)	111 (45.3%)	3.219 (2.105 - 4.924)	<0.001	2.609 (1.628 - 4.180)	<0.001

Knowledge, Attitude and Practice (KAP): Out of 419, 9 participants found to be not at all aware about Hepatitis B on asking about the subject in a different manner. 410 participants found to be aware about Hepatitis B, on asking for the source of acquiring knowledge almost all of them (95.9%) responded with healthcare system/Medical education. Total 382(91.2%), 377(89.98%) and 245(58.47%) participants had good knowledge, positive attitude and good practice respectively.

Class-4 staff (OR=0.74 95% CI (0.006-0.925)) as cadre had statistically significant (p value= <0.05) association with poor knowledge.

PG students (OR=2.8 at 95% CI (1.37-5.86)) and Paramedic students (OR=4.2 at 95% CI (2.47-7.16)), as a cadre were good predictors of good practice (p value = <0.05).

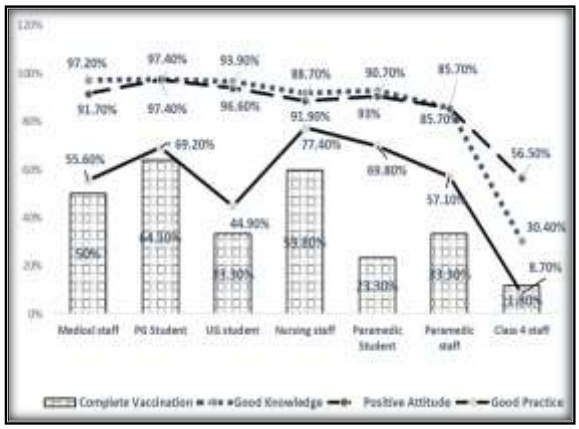

Figure 4: Cadre wise comparison of awareness and vaccination status among healthcare professionals (n=410)

Table 2: Knowledge of Hepatitis B infection, risk of contracting infection and prevention among study participants (n=410)

Knowledge	**n (%)**		
	Bacterial	**Viral**	**Fungal**
Kind of infection	28 (6.83)	381 (92.93)	1 (0.24)
	Yes	No	Don't Know
Carriers having risk of infecting others	385 (93.9)	21 (5.12)	4 (0.98)
Spread through casual contact such as holding hands	46 (11.22)	356 (86.83)	8 (1.95)
Spread through contact with open wounds/cuts	355 (86.59)	45 (10.98)	10 (2.44)
Causes liver cancer	336 (81.95)	41 (10)	33 (8.05)
Vaccination prevents HBV infection	386 (94.15)	17 (4.15)	7 (1.71)
Spread through contaminated blood and blood products	391 (95.37)	11 (2.68)	8 (1.95)
Spread through using un-sterilized syringes, needles and surgical instruments	392 (95.61)	11 (2.68)	7 (1.71)
Spread through unsafe sex	341 (83.17)	54 (13.17)	15 (3.66)
HBV has any laboratory test?	381 (92.93)	7 (1.71)	22 (5.37)
HBV infection is curable/treatable?	249 (60.73)	133 (32.44)	28 (6.83)
HBV has any post exposure prophylaxis?	301 (73.41)	53 (12.93)	56 (13.66)

Table 3: Attitude and practice of Hepatitis B infection, risk of contracting infection and prevention among study participants (n=410)

Attitude	**Agree**	**Disagree**	**Not sure/Don't have any idea**
I am not at risk for getting hepatitis B infection	96 (23.41)	257 (62.68)	57 (13.9)
I do not believe in the hepatitis B vaccination	32 (7.8)	369 (90)	9 (2.2)
Changing the gloves while collecting blood and test is waste of time	43 (10.49)	356 (86.83)	11 (2.68)
All patients should be tested for HBV before they receive healthcare at hospital	303 (73.9)	80 (19.51)	27 (6.59)
I do not like treating patients with HBV	22 (5.37)	366 (89.27)	22 (5.37)
Following infection control guidelines will protect me from getting HBV infection at work	391 (95.37)	8 (1.95)	11 (2.68)

Practice	Yes	No	NA
Ever got screened/tested	97 (23.66)	313 (76.34)	-
How many doses taken?	0 DOSE 74 (18.04) 1 DOSE 28 (6.83) 2 DOSES 129 (31.46) 3 DOSES 179 (43.67)		
Always change gloves for each patient during blood taking and test	303 (73.9)	36 (8.78)	71 (17.32)
Ask for new syringe before use	348 (84.88)	14 (3.41)	48 (11.71)
Ever met a needle prick injury	127 (30.98)	272 (66.34)	11 (2.68)
Always report for a needle stick injury to authorities	316 (77.07)	23 (5.6)	71 (17.33)

Overall mean score for Knowledge is 10.11 while for Attitude and Practice it is 4.98 and 3.42 respectively.

Table 4: Mean score of KAP of Hepatitis B infection, risk of contracting infection and prevention among study participants (n=410)

Mean Score			
Cadre	**Knowledge/12**	**Attitude/6**	**Practice/6**
Medical staff	10.7	4.9	3.2
PG Student	10.7	5.4	3.9
UG student	10.6	5	3
Nursing staff	9.8	4.9	3.9
Paramedic Student	9.5	5	3.6
Paramedic staff	8.1	4.1	3
Class 4 staff	4.8	2.9	1.6

Minimum required score required to get counted as having "Good Knowledge", "Positive Attitude" and "Good Practice" was 8/12 for knowledge questions and 4/6 in case of attitude and practice.

Needle stick injury: Almost one third healthcare workers (31.83%) had met needle stick injury at least once in their life. Proportion of exposed among different cadres, medical staff – 50%, PG students – 64.10%, UG students- 33.30%, Nursing staff – 59.80%, Paramedic students – 23.30%, Paramedic staff- 33.3% and Class 4 – 11.80%.

PG students (OR=4.37 95% CI (1.66-5.01)) and Nursing staff (OR=2.88 95% CI (2.05-9.30)) as cadre were statistically significantly associated ($p<0.05$) with needle stick injury.

Routine Screening: Only 97 (23.66%) HCW got tested for HbsAg till date. On asking for reasons needle stick injury was the most common reason (26.3%) followed by ANC check-up (19.3%) and Routine screening (19.3%) then medical fitness (12.3%), Blood exposure (8.8%), pre-operative procedure (8.8%), Jaundice (3.5%) and Blood donation (1.7%).

DISCUSSION

The present study attempted to determine HBV exposure, vaccination coverage and associated factors, and level of KAP towards HBV. World Health Organization estimated 18–39% coverage of HBV vaccine among healthcare providers in developing countries and 67–79% in developed countries.[9] However, full-dose HBV vaccination coverage obtained in current study was 43.7% only. Higher vaccination coverage should be encouraged for sufficient protection against potential exposure. The study finding was lower than similar studies reported from Kanchipuram, India (72.5%) and China (60%), while similar to Uganda (44.3%) and Nepal (37%).[10-13]

This study revealed that 21% of unvaccinated HCWs thought that following infection control precautions and being careful would be enough to prevent HBV infection at their workplace. Healthcare personnel who view their susceptibility to HBV infection as high are more likely to be vaccinated than their counterparts who view their susceptibility to infection as low.[14] In other studies, those who wore gloves all or most of the time when they cared for patients or instruments were more likely to be vaccinated.[15] Appropriate knowledge about the transmission and prevention of HBV infection is vital in this regard. Two out of the three unvaccinated HCWs who responded reported that they had not been offered hepatitis B vaccination,[16] which is in line with the current study as 25% study participants responded with the similar reason. Increased publicity for the vaccine would empower HCWs to demand vaccine and know how to access the vaccine. Reports show that publicity campaigns regarding the vaccination of HCWs yielded nearly complete protection rates among HCWs.[17] In European countries, policies differ; some countries enforce the mandatory vaccination of HCWs.[18]

Male study participants were less likely to take full-dose hepatitis B vaccination than females study participant. This finding was consistent with the study conducted in Wolayita hospital in Southern Ethiopia,[19] and Uganda,[20] which revealed a higher vaccination rate among female participants. This might be because women have a higher risk perception than men, and women are more concerned about their health.

Study participants who had good knowledge and good practices towards HBV were more likely to take full-dose vaccination than their counterparts. This finding agreed with a study conducted among health care workers at Wolayita Sodo hospital in Southern Ethiopia.[19] This might be because of better awareness and practice about the occupational

hazards of HBV which makes them have a higher acceptance of vaccination than their counterparts.

Despite the different professional backgrounds of the study participants, our finding revealed that 91.2% of study participants had a good level of knowledge regarding HBV, its mode of transmission, and prevention. This finding was higher than the previous studies reported from Makerere University, Uganda (74.6%),[12] Kochi, India (79.1%),[21] and Jimma University Medical Center, Ethiopia (73.9%),[22] and Kanchipuram, India 43%.10 The difference might be due to the variation in health policies and programs across the countries; in current institute, training and orientation on universal precautions were given to health care providers before enrolling in clinical practice, which makes them know more about occupational exposures toward contagious infections.

Regarding attitude of study participants towards HBV and its vaccination, 89.98% had positive attitudes regarding HBV. The majority (95.37%) of participants were aware that following infection control guidelines will protect them from risk of contracting HBV at the workplace and 90% of them believe that HBV vaccine is effective and safe. Several previous studies reported comparable results with the current study like study finding reported from Kochi, India 84.3% and Kanchipuram, India 62.5%.[10,21]

In the current study, 58.47% of the participants had good practices against hepatitis B. This finding was higher than the study reported from Senegal 32.4%.[23] But it was lower than the study reported from Kanchipuram, India 72.5%.[10] However, finding of present study was in line with the study reported from Kochi, India,[21] Nepal,[13] and Southwest Ethiopia.[4]

In this study, 31.83% participants had experienced Needle Stick Injury which is in line to a systematic review (35.7%).[24] However higher than findings reported in Manglore (24.8%) and lower than studies conducted at Nepal (42.8%) and Nigeria (48%).[25-27]

CONCLUSION

Despite having good knowledge over all, adherence to current Hepatitis B Immunization is poor (mainly in Class 4 staff and Paramedic students) as only less than half is fully vaccinated which makes them vulnerable to Hepatitis B infection. Not offered a chance and very careful by universal precaution were frequently mentioned reasons for not being vaccinated. The current study revealed that almost half of the study participants had malpractice towards HBV prevention, despite having good knowledge against HBV and its prevention measures. Better strategies need to be found to translate the level of knowledge into preventive practices among the study participants. Risky practices among the study participants were highly prevalent among participants who had been exposed to needle prick injury during their professional activities at mean age of 27 years which makes them vulnerable to future threats of exposure. This finding suggests that there is a need to address the barriers by strengthening training on universal safety precautions for prevention of blood-borne pathogens.

Recommendations: All healthcare workers in the medical services proficient ought to be immunized before they enter clinical attachments due to high risk of getting exposed to HBV infection. Most of them are missing the third dose which can be overcome by sending them reminder messages the way it is adopted in Covid vaccination. Provisions of training on infection prevention mechanisms and universal precautions particularly on HBV should be done for new comers and it should be sustained on regular basis and creating awareness on attitudes and practices of healthcare workers towards HBV to enhance optimal utilization of the vaccine. Awareness session among Class 4 workers is necessary as knowledge among them is poor. Evaluation of reasons for not getting completely vaccinated among paramedic students is required. I have not been offered a chance for vaccination and not having enough education regarding Hep B vaccination are the major reasons for not getting vaccinated which can be overcome by regular campaigning of Hep B vaccination and Hepatitis B awareness programs.

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