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A study of knowledge, attitude and practice of hepatitis B Infection Prevention control measure among the 2nd year MBBS and Nursing students in Medical College of Tertiary Care Centre, Maharashtra, India

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ABSTRACT

Background: The prevalence of hepatitis B virus Infection in health care workers have 2-10 times greater than general population, due to their increased vulnerability to contaminated needles and syringes, as well as exposure to contaminated blood and bodily fluids, medical students are even more at risk of unintentional exposure because of their inexperience, inadequate training, and ignorance of preventative measures towards the hepatitis b infection control measure. The **objective** of this study is; to study of knowledge, attitude and practice of hepatitis B Infection Prevention control measure among the 2nd year MBBS and Nursing students. **Methods:** A cross-sectional study was conducted among 210 students from February to march 2025. A pretested self-administered questionnaire was used to collect data regarding knowledge, attitude, and practice towards Hepatitis B infection prevention control measure. Data was gathered via non-probability convenience sampling. $\chi 2$ test was used to determine the association between categorical independent variables and categorical dependent variables. **Results:** Among 210 students, 77.78 % MBBS students and 76.00 % nursing students had a good knowledge towards the hepatitis B Infection control measure. The attitude and practice (76.00 % and 70.67%) are also good in nursing students compared to MBBS students in our finding. There was significant association are found with only attitude towards Hepatitis B infection control measure. **Conclusion:** The knowledge levels are almost good in all age group in our study and some significant differences are found in attitude and practice. These results highlight the necessity of focused educational initiatives to enhance behaviours and attitude, especially among male and MBBS students, in order to effectively prevent and control HBV infection.

Keywords: Knowledge, Attitude, Hepatitis B Infection control, practice, MBBS, nursing students.

Introduction:

Approximately one-third of the world's population is infected with hepatitis B, which causes 1.2 million new infections annually, 1.1 million deaths, primarily from cirrhosis and hepatocellular carcinoma, and over 254 million chronic infections.[1] The only DNA virus among hepatitis viruses is HBV, which is an enclosed DNA virus.[2] The main ways that HBV is spread include sharing needles during injections, reusing contaminated needles, unprotected sexual contact, perinatal transmission, and coming into touch with an infected person's blood or other bodily fluids.[3,4,5]. An HBV infection can cause acute self-limiting hepatitis, fulminant hepatitis that necessitates liver transplantation, or subclinical or asymptomatic infection. In addition to developing cirrhosis or hepatocellular cancer, those infected with HBV may also develop chronic HBV infection.[6]. With an average incidence of 4% and a range of 2–7%, India is in the moderate

endemicity zone.[7]. Seroprevalence is two to four times higher among health care workers (HCW) than it is in the general population.[8]. Health care workers, particularly doctors, nurses, and medical students, are constantly in close touch with patients and are susceptible to contracting these infectious diseases mostly by mucosal or percutaneous contact with contaminated blood or bodily fluids.[9]. An estimated 2.6% of healthcare workers worldwide were exposed to HCV, 5.9% to HBV, and 0.5% to HIV per year, according to WHO research. This translates to roughly 16,000 HCV infections and 66,000 HBV infections among healthcare workers worldwide.[10]. Hepatitis B virus infection is most commonly transmitted through the blood. [11]. HBV is the most easily spread bloodborne disease, and even trace amounts of blood can aid in its spread. In the event that an unvaccinated healthcare worker receives a needle prick from blood carrying Hepatitis B surface antigen (HBsAg), the risk of infection varies from 6% to 30%, depending on whether Hepatitis B e antigen (HBeAg) is present and whether the worker has HBV DNA. [12]. It is possible to stop the spread of hepatitis B by being vaccinated, handling infectious materials with care, sterilizing medical equipment, and managing trash, [13,14,15], Because it offers lifetime immunity, HBV vaccination is the mainstay of HBV infection control.[16]. A full course of hepatitis B vaccination has been advised for all healthcare workers by the Center for Disease Control and Prevention (CDC).[17]. Therefore, as a key element of occupational infection prevention strategies, it is highly advised that all healthcare workers be vaccinated against HBV infection. Nevertheless, despite this requirement, vaccination rates among healthcare workers especially in poorer countries remain startlingly low, which presents serious problems for the nation and HBV patients alike. Preventing workplace exposure to HBV requires proper attitudes and sufficient information. However, there is a great deal of variation in HCWs' knowledge on HBV transmission and prevention strategies, with glaring insufficiencies noted, especially in many poor nations. [18]. Therefore, this study was conducted to understand the knowledge, attitude and practice among the MBBS and Nursing students towards the hepatitis B Infection prevention control in tertiary care Centre.

Methods:

Study design, tools and technique-

A cross-sectional study was conducted at Dr. Vasantrao Pawar Medical College, hospital and research Centre, Adgaon, Nashik, Maharashtra, India. **Aim of the study-** To measure the knowledge, attitude, and practice towards the Hepatitis B Infection among Medical students and nursing students. Data were collected during February and March of 2025 using a self-administered questionnaire that had been Pre tested. While the researcher was present, the questionnaire was given to the students in their lecture hall. The questionnaire was taken from one study conducted by Bhattarai et al. [19].

Participants for the study:

Medical undergraduate & nursing students who were willing to participate were included in the study. Students who did not give informed consent were not included in the study. At least 50% of the study population from the selected medical college to answer the questionnaire. Written informed consent was obtained from the study participants. Confidentiality of the information was maintained thoroughly by de-identification.

Outcome measurement and variables:

The independent factors were sociodemographic traits, and the dependent variables were knowledge, attitude, and practice of hepatitis B virus infection control and measures. The questionnaire consisted of three sections A, B & C among knowledge, attitude and practice. All questions were closed ended with answer options “Yes” and “No”. Each correct response was scored as one (1) mark and incorrect response was scored zero (0). Hence, knowledge score of maximum 10 points was designed. The scores were then converted into percentage and was graded as good or adequate for participants who scored greater than or equal to 70% and poor when less than 70%. Similarly, for attitude and practices, participants who scored greater than or equal to 70% were classified as having positive attitude and safe practices, respectively, and less than 70% as having negative attitude and poor practices. This criterion was validated and has been taken from the study of *Thote SR et al. [20]*

Sample size and sampling:

Non-probability convenience sampling was used for collection of data.
The current cross-sectional descriptive study was conducted on 210 medical and nursing students. Here,
n=sample size
Z= statistic for the level of significance (for 95% CI Z =1.96)
P= expected prevalence =50%=0.50
d =margin of error= 0.05
Therefore, sample size = $(1.96)^2 \times 0.5 \times 0.5 / 0.05^2 = 384.16–384$
adjusted sample size=(S)\1+[(S−1) \population] = 210 Adjusted Sample Size for Finite Population.
Because the total population (i.e., total number of medical and nursing students) is limited, the sample size should be adjusted using this formula:
$^{n}adj = S/ 1+(S−1/N)$

Where:

- S=384 (initial sample size)
- N=210 (total population size)

384/1+(384-1)/210 = 384/1+(383/210) = 384/1+1.8238= 384/2.8238=135.98
So, minimum sample size is required ≈ **136.** Therefore, we included **210** sample sizes for this study.

Statistical analysis and software:
Data was entered in Microsoft excel version 2019 and data analysis was performed on IBM- Statistical Package for the Social Sciences (SPSS) version 21. Descriptive analysis was done by calculating frequency and percentages of categorical variables. $\chi 2$ test was used to determine the association between categorical independent variables and categorical dependent variables. P value less than 0.05 was considered significantly associated.

Results:
A total of 210 students from Medical and nursing department of Dr. Vasantrao Pawar Medical College, hospital and research Centre, Adgaon, Nashik, Maharashtra were included in the study. **[TABLE-1].** Out of 210 students 135 students from 2nd year MBBS and 75 students from nursing. 70 (51.85%) were male and 65 (48.15%) were female of all MBBS students. And 25 (33.33%) were male and 50 (66.67%) were female of total nursing students. Overall, a total 210 students of this study, there are a greater number of female students (54.77%) compare to male students (45.23%). According to this table, there are both sexes in both departments; however, there are more female students in the nursing department and slightly more male students in the MBBS department**. [TABLE-2]** Shows the compares of knowledge, attitude, and practice regarding the risk of hepatitis B virus (HBV) infection and control measures between the MBBS students and Nursing students. The Chi-square test and p-values indicate whether there is a significant association between the department and each variable. The distribution of department according to knowledge, 105(77.78%) MBBS students have good knowledge about the risk and transmission of hepatitis B virus infection and control measures, and 30 (22.22%) students have bad knowledge. In nursing students 57(76.00%) have good knowledge about hepatitis B virus infection, and 18 (24.00%) have a bad knowledge. All these differences were not statistically significant (p> 0.05). According to attitude, 83(61.48%) of MBBS students have a positive attitude towards HBV risk of transmission of infection and control measure, and 52(38.52%) students have negative attitude towards of hepatitis B virus infection and control measure. As per the nursing students 57(76.00%) have a positive attitude, and 18(24.00%) do not have positive attitude. There is a significant association between the department and attitude (p-value < 0.05). Nursing students have a higher percentage of positive attitudes compared to MBBS students. As per practice 89 (65.93%) MBBS students have practice control measure for hepatitis B virus infection and 46 (34.07%) do not have. according to nursing students, 53 (70.67%) students have practice control measures, and 22 (29.33%) do not have practice control, measure. These differences were not statistically significant (p> 0.05) between the department and practice. **[TABLE -3]** shows the compare of knowledge, attitude, and practice about the risk of hepatitis B virus (HBV) infection and control measures between male and female students. As per gender wise knowledge, 72 (75.79%) male students have good knowledge, and 23 (24.21%) students have lack of knowledge followed by 90 (78.26%) female students have good knowledge, and 25 (21.74%) students have lack of knowledge. In this association, were not statistically significant (p> 0.05). Based on attitude, 55 (57.89%) male students have a positive attitude, and 40 (42.11%) students don't have positive attitude. There is a statistically significant association between gender and attitude (since p-value < 0.05). As per the practice 57 (60.00%) male students have practice control measures, and 38 (40.00%) do not. And 85 (73.91%) female students have practice control measures, and 30 (26.09%) have need of practice control measures. Theses association is statistically significant (p-value < 0.05) regarding the control measures for hepatitis B virus infection.

TABLE-1: Department wise distribution of male and female students.

Department	Total Students	Gender	Frequency	Percentage
MBBS	135	Male	70	51.85
		Female	65	48.15
Nursing	75	Male	25	33.33
		Female	50	66.67
Total	210	Male	95	45.23
		Female	115	54.77

TABLE -2: Association between department and Knowledge, Attitude, Practice regarding the risk of hepatitis B virus infection and control measure.

Department		MBBS		Nursing		Chi-square	p value
Variables		Frequency	Percentage	Frequency	Percentage		
Knowledge	Yes	105	77.78	57	76.00	0.09	0.77
	No	30	22.22	18	24.00		
Attitude	Yes	83	61.48	57	76.00	4.57	**0.032**
	No	52	38.52	18	24.00		
Practice	Yes	89	65.93	53	70.67	0.50	0.48
	No	46	34.07	22	29.33		
* p value less than 0.05, shows significant association							

TABLE- 3: Association between Gender and Knowledge, Attitude, Practice regarding the risk of hepatitis B virus infection and control measure.

Gender		Male		Female		Chi-square	p value
Variables		Frequency	Percentage	Frequency	Percentage		
Knowledge	Yes	72	75.79	90	78.26	0.18	0.67
	No	23	24.21	25	21.74		
Attitude	Yes	55	57.89	85	73.91	6.01	**0.014**
	No	40	42.11	30	26.09		
Practice	Yes	57	60.00	85	73.91	4.60	**0.032**
	No	38	40.00	30	26.09		
* p value less than 0.05, shows significant association							

Discussion:

Our study provides critical insights into the knowledge, attitudes, and practices of medical and nursing students from Dr. Vasantrao Pawar Medical College Hospital and Research Centre, Adgaon, Nashik Maharashtra, regarding the risks of hepatitis B virus (HBV) infection and its control measures, suggesting gaps and areas for improvement. Among the 210 participants, a higher proportion of female students (54.77%) was observed, aligning with trends in nursing education being predominantly female-driven. This reflects findings from previous studies, where female students often pursue nursing due to altruistic and social incentives, envisioning roles centered on care and compassion, while male students focus on leadership and technical aspects **[21].** Both groups displayed commendable knowledge levels (77.78% in MBBS and 76.00% in nursing students), with no statistically significant differences ($p = 0.77$), suggesting that current curricula adequately address HBV-related education. These findings are consistent with previous studies highlighting the general awareness of HBV among healthcare students. A synthesis of 16 studies showed the vital role of nurses in hepatitis B elimination through health education, equitable access, and advanced care delivery. These interventions significantly improved screening rates (64%), vaccination odds (2.61-fold), and treatment adherence, highlighting their impact on prevention and control efforts. This supports our findings on the importance of targeted education and interventions to enhance awareness and practice among healthcare students **[22].** One more such study by **[23]** emphasizes the critical role of structured educational programs in improving HBV knowledge. In our study, attitudes varied significantly ($p = 0.032$), with nursing students (76.00%) exhibiting a higher positive attitude compared to MBBS students (61.48%), likely due to the more patient-centric training in nursing education. This reflects findings from previous studies, where female students pursue nursing with a positive attitude, often motivated by altruistic and social incentives, envisioning compassionate caregiving roles **[24].** This study was also supported by **[25]** who reported that nursing students often

show stronger empathy and preventive healthcare attitudes. Practices, although better in nursing students (70.67%) compared to MBBS students (65.93%), showed no statistically significant difference ($p = 0.48$), highlighting a disconnect between theoretical knowledge and practical implementation. Gender analysis revealed no significant differences in knowledge ($p = 0.67$), but attitudes ($p = 0.014$) and practices ($p = 0.032$) were significantly better among female students, with 73.91% demonstrating positive attitudes and practicing proper control measures compared to 57.89% and 60.00% of males, respectively. Similar gender-specific variations in health-related behavior have been documented, such as the findings of **[26],** which attribute such disparities to cultural and societal influences on health awareness and compliance. These results show the necessity of targeted interventions, particularly to address gaps in practical application and gender disparities. Strengthening experiential learning through simulations and supervised clinical practice can help bridge these gaps **[27].** Furthermore, our study supports the integration of behavioral change frameworks into medical and nursing curricula to enhance attitudes and practices. Overall, this research reinforces the need for ongoing education and practical training to equip healthcare students with the necessary tools to mitigate HBV risks effectively.

Conclusion and Recommendation:

This present study conducted on knowledge, attitude and practice between second year MBBS and nursing students regarding risk and prevention of hepatitis b virus infection. The knowledge levels are almost good in all age group in our study and some significant differences are found in attitude and practice, especially favouring female and nursing students. These results highlight the necessity of focused educational initiatives to enhance behaviours and attitude, especially among male and MBBS students, in order to effectively prevent and control HBV infection.

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