

Knowledge of Hepatitis B And Vaccination Status of Students of Dang Thuy Tram Medical College

Pham Dinh Vu*, Bui Ta Tuong, Nguyen Hong Ly, Nguyen Tin

Phuc Hung General Hospital, Quang Ngai province, VietNam

*Corresponding Author

DOI: <https://doi.org/10.51244/IJRSI.2025.1215000161P>

Received: 23 September 2025; Accepted: 28 September 2025; Published: 24 October 2025

ABSTRACT

Background: Hepatitis B remains one of the most prevalent infectious diseases in Vietnam and can lead to severe complications such as cirrhosis and hepatocellular carcinoma. Despite the wide availability of hepatitis B vaccines, vaccination coverage among adolescents and healthcare students remains suboptimal. Knowledge, attitudes, and practices (KAP) of healthcare students are crucial not only for their own protection but also for future health education efforts in the community.

Objective: To assess the knowledge, attitudes, and practices regarding hepatitis B infection and vaccination among students at Dang Thuy Tram Medical College and to identify gaps for targeted interventions.

Methods: A cross-sectional study was conducted among 270 students from general medicine, nursing, and pharmacy programs in the 2024-2025 academic year. Data were collected using a structured KAP questionnaire with 30 multiple-choice items and a 5-point Likert scale. Statistical analysis was performed using SPSS 20.0, including descriptive statistics and Chi-square tests.

Results: Of the 270 participants, 80.7% demonstrated good knowledge and 95.5% reported positive attitudes toward hepatitis B prevention. However, only 4.8% achieved good practice, and 14.8% completed the full three-dose vaccination schedule. Students with positive attitudes were nearly twice as likely to be fully vaccinated (OR = 1.94; 95% CI: 1.16-3.24; $p = 0.010$), whereas other factors showed no significant associations.

Conclusion: Although healthcare students showed good knowledge and positive attitudes toward hepatitis B, vaccination practices remain insufficient. Strengthening health education, counseling, and on-campus vaccination support programs is necessary to improve vaccination uptake in this population.

Keywords: Hepatitis B virus; Hepatitis B vaccine; Knowledge; Attitudes; Practices; Healthcare students.

INTRODUCTION

Hepatitis B virus (HBV) infection remains a major global health problem, with an estimated 296 million people living with chronic infection. HBV is a leading cause of cirrhosis, liver failure, and hepatocellular carcinoma, contributing substantially to annual mortality worldwide [1]. In Vietnam, the prevalence of hepatitis B surface antigen (HBsAg) positivity in the general population has been reported to range between 10-20%, placing the country among highly endemic regions [2]. Occupational exposure further increases the risk of HBV transmission in healthcare settings [3].

Vaccination is recognized as the most effective and safe preventive measure against HBV [4]. Since the early 2000s, Vietnam's Expanded Program on Immunization has introduced the HBV vaccine schedule for infants. Population-based evaluations indicate that the three-dose schedule has significantly reduced HBsAg prevalence across younger age groups; however, gaps in birth dose administration and subsequent doses have affected coverage rates at certain periods [5]. Moreover, a considerable proportion of adolescents and young

adults-particularly those born before widespread implementation of the birth dose-may not have received full vaccination in early childhood, creating an immunity gap in this age group [6].

Healthcare students represent a critical population, as they face occupational exposure during clinical training and later play key roles in community health education and care delivery. Their knowledge, attitudes, and practices (KAP) regarding HBV prevention and vaccination directly influence personal safety and shape the effectiveness of public health interventions [6].

Previous studies in Vietnam have reported discrepancies between awareness of HBV and actual vaccination uptake. While surveys among medical students have shown relatively high rates of at least one vaccine dose, the proportion completing the full series (≥ 3 doses) remains suboptimal [7]. In contrast, evidence regarding students in health colleges-who constitute the majority of grassroots healthcare workforce, especially in central and highland provinces-remains limited. This evidence gap highlights the need for comprehensive assessment and targeted interventions in this group.

Based on this context, our study aimed to assess knowledge, attitudes, and practices regarding HBV prevention and vaccination among students of Dang Thuy Tram Medical College, Quang Ngai province, in the academic year 2024-2025. The findings are expected to provide practical evidence for developing strategies to improve vaccination coverage and strengthen HBV-related competencies among future healthcare professionals, thereby contributing to reducing the burden of HBV in the community.

MATERIALS AND METHODS

Study design

A cross-sectional descriptive study was conducted to assess knowledge, attitudes, and practices (KAP) related to hepatitis B prevention among students.

Study setting and period

The study was carried out at Dang Thuy Tram Medical College, Quang Ngai province, Vietnam, from October 2024 to June 2025.

Study population

Inclusion criteria: All full-time students enrolled in Medicine, Nursing, and Pharmacy programs (from first to final year of the 2024-2025 academic year) who consented to participate by signing the informed agreement.

Exclusion criteria: Students absent at the time of survey administration or those who did not complete the questionnaire.

Sample size and sampling method

The minimum sample size was estimated using the formula for a single population proportion:

$$n = \frac{Z_{1-\alpha/2}^2 \cdot p \cdot (1-p)}{d^2}$$

where:

- n : estimated sample size.
- $Z_{1-\alpha/2}$: standard normal value at 95% confidence level ($Z=1.96$).
- p : expected prevalence. Since no comparable studies were identified, $p = 0.5$ was used to obtain the largest

possible sample size.

- d : margin of error (0.05).

The calculation yielded a minimum of 384 participants. However, due to institutional size, a total of 270 eligible students were included using a census approach.

Sampling method: Convenience sampling was employed. Researchers coordinated with the college administration, Student Affairs Office, and class monitors to explain study objectives and distribute questionnaires to all students present during randomly selected class sessions.

Data collection tools and methods

Data were collected using a self-administered structured questionnaire, adapted from previous studies [5,6] and validated by epidemiology and hepatology experts. The instrument included four sections:

General information: age, sex, program of study, and academic year.

Knowledge (10 items): assessed awareness of HBV transmission routes, complications, and preventive measures. Each correct answer was scored as one point.

Attitudes (10 items): assessed perceptions of HBV vaccination importance using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Practices (10 items): assessed vaccination status and preventive behaviors.

A pilot test was conducted on 20 students (not included in the main sample) to evaluate clarity and consistency. The Cronbach's alpha coefficient for the attitude scale was 0.78, indicating acceptable reliability.

Data processing and analysis

Data were entered into Microsoft Excel 2016, cleaned, coded, and analyzed using SPSS version 20.0.

Descriptive statistics were applied to summarize sociodemographic characteristics, KAP, and vaccination status. Categorical variables were presented as frequencies and percentages; continuous variables were summarized as medians and ranges.

Inferential statistics: Chi-square (χ^2) or Fisher's exact tests were used to assess differences in proportions between groups (study program, academic year, KAP levels, vaccination status). Associations were quantified using odds ratios (OR) with 95% confidence intervals (CI).

Logistic regression (univariate and multivariate) was performed to identify independent factors associated with completion of three HBV vaccine doses. Model performance was assessed using receiver operating characteristic (ROC) curves and area under the curve (AUC).

A p -value < 0.05 was considered statistically significant.

Ethical considerations

The study protocol was reviewed and approved by the Board of Directors of Dang Thuy Tram Medical College.

All participants were informed of the study objectives and provided written informed consent prior to participation. Confidentiality of personal information was strictly maintained, and data were used solely for research purposes.

RESULTS

Table 1. Demographic characteristics of study participants (n = 270)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	31	11.5
Female	239	88.5
Field of study		
Physician Assistant	51	18.9
Nursing	92	34.1
Pharmacy	121	44.8
Other	6	2.2
Year of study		
Year 1	170	63.0
Year 2	85	31.5
Year 3	15	5.6
Age	Median = 20; SD = 2.47; Range = 19-43	

Table 1 presents the demographic characteristics of the 270 students included in the survey. The majority were female (239/270; 88.5%). Pharmacy students accounted for the largest proportion (121; 44.8%), followed by Nursing (92; 34.1%) and Physician Assistant students (51; 18.9%). Most participants were first-year students (170; 63.0%). The median age was 20 years (SD = 2.47; range 19-43 years).

Table 2. Distribution of knowledge, attitudes, and practices (n = 270)

Domain	Category	Frequency (n)	Percentage (%)
Knowledge	Poor	3	1.1
	Moderate	49	18.1
	Good	218	80.7
Attitude	Poor	12	4.4
	Moderate	121	44.8
	Good	137	50.7
Practice	Poor	110	40.7
	Moderate	147	54.4
	Good	13	4.8

Table 2 shows the overall levels of knowledge, attitudes, and practices regarding HBV. A large proportion of students demonstrated good knowledge (218; 80.7%), while only 1.1% had poor knowledge. Attitudes were mostly positive, with 50.7% classified as good and 44.8% as moderate. However, practices were suboptimal: only 4.8% had good practices, while 54.4% and 40.7% were moderate and poor, respectively, highlighting a substantial gap between knowledge/attitudes and preventive practices.

Table 3. Distribution of knowledge, attitude, and practice levels regarding hepatitis B vaccination by academic year (n = 270)

Field of study	Poor n (%)	Moderate n (%)	Good n (%)	Total	Chi-square test
Knowledge					
Physician assistant	2 (3.9)	7 (13.7)	42 (82.4)	51	$\chi^2(6, N=270) = 10.56$ $p = 0.103$
Nursing	1 (1.1)	13 (14.1)	78 (84.8)	92	
Pharmacy	0 (0.0)	29 (24.0)	92 (76.0)	121	
Others	0 (0.0)	0 (0.0)	6 (100.0)	6	
Attitude					
Physician assistant	3 (5.9)	22 (43.1)	26 (51.0)	51	$\chi^2(6, N=270) = 5.23$; $p = 0.515$
Nursing	2 (2.2)	45 (48.9)	45 (48.9)	92	
Pharmacy	6 (5.0)	53 (43.8)	62 (51.2)	121	
Others	1 (16.7)	1 (16.7)	4 (66.7)	6	
Practice					
Physician assistant	14 (27.5)	37 (72.5)	0 (0.0)	51	$\chi^2(6, N=270) = 8.87$; $p = 0.180$
Nursing	43 (46.7)	43 (46.7)	6 (6.5)	92	
Pharmacy	52 (43.0)	63 (52.1)	6 (5.0)	121	
Others	1 (16.7)	4 (66.7)	1 (16.7)	6	

As shown in Table 3, most students across all study fields had good knowledge (76.0-100%), with Pharmacy students showing the highest proportion of moderate knowledge (24.0%) and Physician Assistant students the highest proportion of poor knowledge (3.9%). Attitudes were generally positive across fields (92.2-100%). However, good practices remained very low (0-6.5%). No statistically significant differences were observed between fields.

Table 5. Distribution of knowledge, attitude, and practice levels regarding hepatitis B vaccination by academic year (n = 270)

Academic year	Poor n (%)	Moderate n (%)	Good n (%)	Total	Chi-square test
Knowledge					
Year 1	0 (0.0)	26 (15.3)	144 (84.7)	170	$\chi^2(4, N=270) = 25.22; p < 0.001$
Year 2	1 (1.2)	20 (23.5)	64 (75.3)	85	
Year 3	2 (13.3)	3 (20.0)	10 (66.7)	15	
Attitude					
Year 1	4 (2.4)	78 (45.9)	88 (51.8)	170	$\chi^2(4, N=270) = 10.83; p = 0.028$
Year 2	5 (5.9)	38 (44.7)	42 (49.4)	85	
Year 3	3 (20.0)	5 (33.3)	7 (46.7)	15	
Practice					
Year 1	64 (37.6)	97 (57.1)	9 (5.3)	170	$\chi^2(4, N=270) = 2.33; p = 0.676$
Year 2	40 (47.1)	42 (49.4)	3 (3.5)	85	
Year 3	6 (40.0)	8 (53.3)	1 (6.7)	15	

Table 4 indicates significant differences in knowledge and attitudes across study years. Knowledge was good overall but poorest among third-year students (66.7%), with statistically significant differences ($\chi^2 = 25.22$; $p < 0.001$). Attitudes were largely positive (>90%), with significant variation between years ($\chi^2 = 10.83$; $p = 0.028$). Practices remained consistently poor across all years, with no significant differences ($p = 0.676$).

Table 5. Hepatitis B vaccination status among students

Vaccination status	n	%
Not vaccinated / Cannot recall	214	79.3
Partial (1-2 doses)	16	5.9
Complete (3 doses)	40	14.8
Total	270	100

Table 5 shows that only 14.8% of students reported completing the three-dose HBV vaccination schedule. The majority (214; 79.3%) had either not been vaccinated or could not recall their vaccination status, and 5.9% had received only one or two doses. This highlights the low vaccine coverage among health students.

Table 6. Distribution of hepatitis B vaccination status by knowledge, attitude, and practice groups

Vaccination status	Poor/Fair n (%)	Good n (%)	Total	Chi-square test
Knowledge				
Not vaccinated/Uncertain	47 (20.4)	183 (79.6)	230	$\chi^2(1, N=270) = 0.92$; $p = 0.338$
Complete (3 doses)	5 (12.5)	35 (87.5)	40	
Attitude				
Not vaccinated/Uncertain	113 (49.1)	117 (50.9)	230	$\chi^2(1, N=270) = 6.67$; $p = 0.010$
Complete (3 doses)	20 (50.0)	20 (50.0)	40	
Practice				
Not vaccinated/Uncertain	230 (100.0)	0 (0.0)	230	$\chi^2(1, N=270) = 88.96$; $p < 0.001$
Complete (3 doses)	27 (67.5)	13 (32.5)	40	

Table 6 demonstrates that students with good knowledge had a higher proportion of complete vaccination (87.5% vs. 79.6%), although the difference was not statistically significant. Students with good attitudes were significantly more likely to be fully vaccinated (OR = 1.94, 95% CI: 1.16-3.24; $p = 0.010$). Importantly, all students with good practices had completed the full three-dose schedule, and this association was highly significant ($p < 0.001$).

Table 7. Multivariate logistic regression of factors associated with completion of three-dose hepatitis B vaccination

Independent variable	Adjusted OR (95% CI)	p-value
Gender	0.55 (0.19 - 1.56)	0.262
Age	1.01 (0.89 - 1.15)	0.827
Field of study	1.31 (0.83 - 2.09)	0.250
Academic year	0.96 (0.52 - 1.76)	0.895
Knowledge	1.97 (0.71 - 5.44)	0.192
Attitude	0.93 (0.47 - 1.83)	0.830

As shown in Table 7, none of the independent factors were significantly associated with full vaccination in multivariate logistic regression (all $p > 0.05$). Good knowledge showed a non-significant trend toward higher vaccination (OR = 1.97, 95% CI: 0.71-5.44). Students from non-medical fields had a trend toward higher vaccination (OR = 2.01, 95% CI: 0.91-4.45; $p = 0.086$).

Table 8. Multivariate logistic regression of factors associated with good practice in hepatitis B vaccination

Independent variable	Adjusted OR (95% CI)	p-value
Gender	0.44 (0.08 - 2.42)	0.342
Age	1.07 (0.89 - 1.28)	0.491
Field of study	2.01 (0.91 - 4.45)	0.086
Academic year	0.74 (0.27 - 2.03)	0.560
Knowledge	2.74 (0.34 - 22.26)	0.345
Attitude	3.28 (0.86 - 12.59)	0.083

Table 8 shows no statistically significant predictors of good practice. However, students with good attitudes were more likely to demonstrate good practice (OR = 3.28, 95% CI: 0.86-12.59; $p = 0.083$), suggesting a potential association.

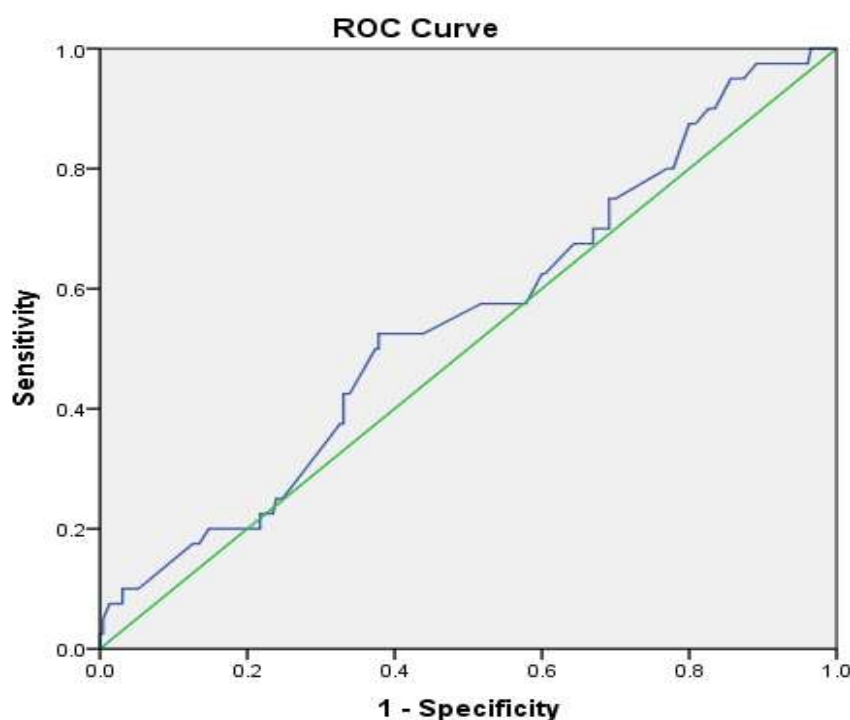


Figure 1. Receiver operating characteristic (ROC) curve of the multivariate logistic regression model for predicting good practice in hepatitis B vaccination.

The ROC curve for the multivariate logistic regression model predicting HBV vaccination practices indicated poor discrimination, with an area under the curve (AUC) of 0.548 (95% CI: 0.452-0.644; $p = 0.332$). At the optimal Youden cut-off (≈ 0.035), sensitivity was 52.5% and specificity was 56.1%, with a Youden index of only 0.086.

DISCUSSION

Our study among 270 students at Dang Thuy Tram Medical College showed that a high proportion had good

knowledge of hepatitis B (80.7%) and most had positive attitudes (95.5%), yet the rate of full three-dose vaccination was very low (14.8%). This indicates a lack of consistency between knowledge, attitude, and practice, and highlights significant barriers to accessing vaccination services among health students.

Compared with a cross-sectional survey at eight Vietnamese medical universities involving more than 2,000 final-year students, the contrast is striking: vaccine coverage reached 83.9% and 84.2% had ever been tested for HBsAg, but only 19.9% achieved an overall "good" KAP score [8]. This suggests that medical university students may have greater access to vaccination and screening, but still face challenges in translating knowledge and attitudes into practice. In contrast, medical college students may demonstrate higher levels of knowledge and attitude but have limited vaccination access, possibly due to cost, policy, or systemic priorities.

A study in Ho Chi Minh City with 225 medical students reported that 63.3% had completed the three-dose series; both good knowledge and good practice were significant predictors of complete vaccination (OR = 2.68 and 8.79, respectively) [7]. Compared with our findings, the higher vaccination rate indicates that the learning environment, institutional policy, and proactive access to information strongly influence vaccination behavior.

Internationally, our findings are consistent with many studies. Thote et al. in India [9] and Shrestha in Nepal [10] found that students had good knowledge and attitude, but practice and full vaccination coverage were limited (35-50%). In Turkey, a multicenter study showed higher vaccination rates, yet financial barriers and access constraints remained obstacles [11]. A meta-analysis in South Asia found that the mean HBV vaccination coverage among health students was only around 56% [13]. Thus, regardless of context, the gap between knowledge/attitude and actual behavior remains a widespread issue.

In our study, students with a positive attitude were nearly twice as likely to complete the three-dose vaccination compared to others (OR = 1.94; 95% CI 1.16-3.24; $p = 0.010$), while knowledge was not statistically significant. Notably, all students with good practice had completed full vaccination, emphasizing the crucial role of vaccination in preventive behavior. This aligns with Vo et al. [7], who also found that attitude and practice were strong predictors of vaccination status.

However, multivariate logistic regression in our study did not identify statistically significant predictors, and the ROC model showed poor predictive capacity (AUC = 0.548). By contrast, several international studies using regression or machine learning models reported stronger predictive performance (AUC ≥ 0.7), suggesting that including systemic factors (e.g., policies, financial support, on-campus vaccination) could improve prediction.

Overall, evidence suggests that key barriers for health students include cost, vaccine availability, lack of mandatory or clear recommendations, and limited communication [11,12]. Therefore, comprehensive strategies are needed to improve vaccination coverage: school-based vaccination programs, financial support, electronic vaccination records, and integration of HBV prevention into training curricula.

CONCLUSION

This study of 270 students at Dang Thuy Tram Medical College found that most had good knowledge (80.7%) and positive attitudes (95.5%) regarding HBV prevention. However, practice was limited, with only 4.8% showing good practice and just 14.8% completing the three-dose series. Multivariate logistic regression did not identify demographic or academic factors significantly associated with vaccination completion or good practice, although good knowledge and positive attitudes showed a trend toward improved behavior. These findings highlight a substantial gap between knowledge/attitude and practice, and emphasize the need for interventions to improve vaccine accessibility, provide financial support, and integrate HBV prevention into the training of health students.

RECOMMENDATIONS

Health education and communication: Regular campaigns, workshops, and integration of HBV content into formal teaching should be implemented. Online resources and social media should also be used to increase

student access to reliable information.

Free or subsidized vaccination policy: Health authorities and educational institutions should provide HBV vaccines free of charge or at subsidized rates for health students, at least at enrollment, to reduce financial barriers.

On-campus vaccination programs: Institutions should organize periodic vaccination sessions to ensure all students are screened and vaccinated as recommended.

Curricular integration: HBV vaccination and prevention should be included in training outcomes, requiring students to demonstrate knowledge of immunization and infection prevention before clinical placements.

Policy and monitoring: Local health authorities should track vaccination status among health students, establish clear policies, and oversee implementation of preventive measures.

Acknowledgements: The authors are grateful to the participants and management of the hospital for their cooperation in carrying out this study.

Declarations

Funding: None

Conflict of interest: None declared

Ethical approval: Ethical clearance was obtained from the Hospital Research and Ethical Committee.

REFERENCES

1. Hsu Y-C, Huang DQ, Nguyen MH. Global burden of hepatitis B virus: current status, missed opportunities and a call for action. *Nat Rev Gastroenterol Hepatol*. 2023;20(8):524-37. doi:10.1038/s41575-023-00760-9.
2. Nguyen VTT. Hepatitis B infection in Vietnam: current issues and future challenges. *Asia Pac J Public Health*. 2012 Mar;24(2):361-73. doi:10.1177/1010539510385220.
3. World Health Organization. Hepatitis B. Fact sheet. 23 Jul 2025. Available from: <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b>. Accessed 9 Sep 2025.
4. Al-Busafi SA, Alwassief A. Global perspectives on the hepatitis B vaccination: challenges, achievements, and the road to elimination by 2030. *Vaccines (Basel)*. 2024;12(3):288. doi:10.3390/vaccines12030288.
5. Komada K, Ichimura Y, Shimada M, Funato M, Do HT, Le HX, et al. Impact of hepatitis B vaccination programs in Vietnam evaluated by estimating HBsAg prevalence. *J Virus Erad*. 2022;8(4):100309. doi:10.1016/j.jve.2022.100309. PMID: PMC9792882.
6. Nguyen TTL, Pham TTH, So S, Hoang THV, Nguyen TTU, Ngo TB, et al. Knowledge, attitudes and practices toward hepatitis B virus infection among students of medicine in Vietnam. *Int J Environ Res Public Health*. 2021;18(13):7081. doi:10.3390/ijerph18137081.
7. Vo LT, Phan DQ, Tran HG, Nguyen LTP, Gyan A, Nguyen HTN, et al. Hepatitis B vaccine coverage in health care students: a cross-sectional study in Vietnam. *PLoS ONE*. 2025;20(3):e0320860. doi:10.1371/journal.pone.0320860.
8. Nguyen NT, Le AT, Dao AT, Tran HT, Nguyen TT, Nguyen TD, et al. Knowledge, attitudes and practices toward hepatitis B virus infection among medical students in Vietnam. *PLoS One*. 2022;17(9):e0273510. PMID: 36074748.
9. Thote A, Chavan R, Jadhav P, Wavare R, Singh R. Knowledge, attitude and practice of hepatitis B vaccination among medical students in central India. *Int J Community Med Public Health*. 2022;9(6):2567-73.
10. Shrestha A, Paudel S, Baral S, Shrestha A, Ghimire R, Adhikari B. Knowledge, attitude and practice regarding hepatitis B among medical students in Nepal. *PLoS One*. 2020;15(11):e0242658. PMID: 33227013.

11. Durusoy R, Yamazhan T, Tasbakan MI, Ergonul O, Celikbas A, Leblebicioglu H, et al. Hepatitis B vaccination and associated factors among health care students in Turkey: a multicenter study. *Vaccine*. 2021;39(40):5839-46. PMID: 34450258.
12. Shah R, Bhandari D, Shrestha N, Yadav AK, Sah MK, Thapa S, et al. Hepatitis B vaccination coverage among medical students in South Asia: a systematic review and meta-analysis. *BMC Public Health*. 2023;23:1884. PMID: 37929371.