Original Article

Evaluation of Knowledge, Attitude and Vaccination Status of Hepatitis B among Pre-Clinical Medical Students of Rawalpindi Medical University

Amna Idrees[1], Aiman Sarfraz[2], Abeera Asad[3], Amna Zafar[4], Amna Asghar[5], Aqsa Mehfooz[6]
[1,2,3,4,5,6]Third Year MBBS students, Rawalpindi Medical University, Rawalpindi

Author's Contribution
[1,2,] *Conception of study*
[1,2,4] *Experimentation/Study Conduction*
[1,2,3,5] *Analysis/Interpretation/Discussion*
[1,2,3,4,5,6] *Manuscript Writing*
[6] *Critical Review*
[1,2,3,4,5,6] *Facilitation and Material analysis*

Corresponding Author
Aqsa Mehfooz
3rd Year MBBS Student,
Rawalpindi Medical University,
Rawalpindi
Email: aqsamehfooz01@gmail.com

Article Processing
Received: 15/05/2025
Accepted: 01/08/2025

Cite this Article: ***Idrees A, Sarfraz A, Asad A, Zafar A, Asghar A, Mehfooz A. Evaluation of knowledge, attitude and vaccination status of hepatitis B among pre-clinical medical students of Rawalpindi Medical University. SJRMC. 2025;S1.***

Conflict of Interest: *Nil*
Funding Source: *Nil*

Access Online:

Abstract

Background: Hepatitis, a viral liver inflammation, poses a major health challenge in Pakistan, with 2.5% hepatitis B and 4.9% hepatitis C prevalence. Medical students face high risk from inadequate awareness, low vaccination, and needle-stick injuries, underscoring the need for improved education.
Objectives: The aim of this research is to evaluate knowledge, attitude vaccine status of hepatitis B among medical students of preclinical years in Rawalpindi Medical, along with reasons of incompliance, if any.
Materials and Methods: We conducted a cross-sectional study utilizing a pre-validated questionnaire to collect data concerning demographic details, knowledge, attitude, practice, and hepatitis B vaccination status from non-clinical year medical students. Data from a total of 249 students were collected through convenience sampling. Statistical analysis was performed to interpret the findings.
Results: Out of 266 participants, aged 17 to 27 years, the majority were female (n=202, 75.9%). Regarding knowledge, 66.5% strongly agreed that hepatitis was caused by a virus. A substantial majority also understood that hepatitis causes liver inflammation (43.2% strongly agreed, 41% agreed). In terms of attitude, only 38% considered healthcare workers to be at an increased risk for hepatitis B, yet 52.6% believed in the efficacy of hepatitis B vaccination. 174 (65.4%) participants were vaccinated, while 92 (34.6%) remained unvaccinated, reflecting a relatively high vaccination coverage.
Conclusion: This study revealed mixed knowledge of hepatitis B among preclinical students. However, a relatively high vaccination status observed suggests a positive disposition towards hepatitis B immunization within this group.
Keywords: Hepatitis B, Vaccination, Students, Medical, Knowledge, Attitudes, Practice, Cross-Sectional Studies

Introduction

Hepatitis is an inflammatory condition of the liver caused by viral infections or other factors such as alcohol consumption, certain drugs, and toxins, etc. It has five main types. Among them, Hepatitis B is a viral infection, leading to both acute and chronic illnesses.[1] It ranks among the top ten global diseases, posing morbidity, mortality, and decreased quality of life.[2] Around 296 million people suffered from chronic Hepatitis B in 2019, with 1.5 million new infections yearly.[3] Healthcare workers face a 5.9% exposure rate to blood-borne HBV infections annually.[4]

As of 2023 in Pakistan, with a population of 241.49 million, the prevalence of Hepatitis C is 11.55% and Hepatitis B is 2.5%, with a high rate of infection.[5,6] The virus spreads through the reuse of contaminated needles, syringes, or sharp objects in healthcare settings. It can also be transmitted from the mother to the baby during childbirth or by consuming contaminated water or food.[7] Fortunately, vaccines are available and effective in preventing Hepatitis B.[1]However, vaccination rates vary significantly between developing and developed countries, with only 18-39% of healthcare workers vaccinated in developing nations, compared to 67-79% in developed countries.[8] However, in underdeveloped countries, the status of hepatitis vaccination is contentious.

Preventing viral hepatitis is crucial, and proper knowledge and attitudes are key to transmission prevention. Healthcare workers are at risk of contracting HBV, especially in countries lacking mandatory vaccination programs and adequate knowledge.[4]

A study in Pakistan revealed that only 40% of healthcare workers completed HBV immunization.[9] High vaccination costs deterred 47.7% of healthcare workers, while 33.7% of medical students believed they were not at risk.[10] However, medical students are indeed vulnerable due to the absence of mandatory vaccination programs and a lack of awareness and compliance with the HBV vaccine.[11] Medical students also have the highest prevalence of needle stick injuries, often under-reported.

Studies revealed that first-year medical students have poor understanding and awareness of Hepatitis B, including its transmission routes, risk factors, and preventive measures, when compared to fifth-year medical students.[12]

The data draws a line under the urgent need for inclusive education and vaccination programs targeting both healthcare workers and medical students, particularly in regions with high prevalence rates like Pakistan. Doing so could bridge knowledge gaps and cultivate a dynamic approach to infection control among future healthcare professionals.[12] Moreover, a culture of reporting needlestick injuries and providing adequate support and resources for post-exposure management are interpretative steps in shielding the health and safety of healthcare workers

The objective of this study is to evaluate the knowledge, attitude, and vaccination status regarding Hepatitis B among pre-clinical medical students at Rawalpindi Medical University, and to identify possible reasons for non-compliance with the recommended vaccination schedule.

Materials and Methods

A cross-sectional descriptive study that aimed to evaluate the knowledge, attitude, and vaccination status of hepatitis B in pre-clinical medical years students was conducted at Rawalpindi Medical University, Pakistan from October 2023 to March 2024. After taking informed consent, data were collected from medical students using a self-structured but pre-validated questionnaire

Anonymity and confidentiality of data were maintained throughout the study to minimize the chances of negatively affecting the study participants' health (mental or physical).

The research was carefully conducted under the supervision of the Community Medicine department at Rawalpindi Medical University. The researchers remained committed to ethical research practices and ensured adherence to the highest standards. Informed consent was taken from the participants, ensuring they understood the purpose and scope of the study. Participants' confidentiality and identities were upheld.

Students of pre-clinical years (1st and 2nd) made up the study population. The students who were enrolled in Rawalpindi Medical University's first and second years of MBBS during the academic year 2022–2023 met the inclusion criteria.

Participants who have been previously diagnosed with Hepatitis B at any point in their lives were excluded. Using a Raosoft sample calculator from a population of 700 preclinical medical students enrolled at Rawalpindi Medical University, a sample size of 249 was obtained, with a population proportion of 50.8% [13],95% confidence interval, with a 5% margin of error.

After conducting a thorough literature analysis, a semi-structured pre-piloted knowledge, attitude, and practice questionnaire was used to collect data, and its internal consistency was assessed by using Cronbach's α. The internal reliability of the present study was found to be 0.698 indicating high internal consistency for our scale for this specific sample, which was adapted from a previously published study.[19] The questionnaire was divided into three domains to assess knowledge of Hepatitis B, attitude towards vaccination, vaccination practices and reasons of non-compliance. The demographic section was modified according to the academic settings of Rawalpindi Medical University. Responses were recorded on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree for knowledge and attitude items, while practice questions were closed-ended.

Data was analyzed in IBM SPSS Statistics Version 22. Descriptive statistics tests were applied, including mean, frequency, and percentage, to determine the relationship between the various variables to identify the vaccination status and awareness among students. The normality of the data distribution was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. As the data were found to be non-normally distributed (p=0.00), IDF.NORMAL function was applied. For inferential analysis, independent samples t

tests were used to compare KAP scores between groups. One-way ANOVA and post hoc tests were employed to assess the variations in KAP scores among groups based on the number of vaccine doses received. Pearson's correlation coefficient was calculated to explore the relationship between age and KAP scores. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 266 people participated in the research, the majority of whom were females (n=202, 75.9%), and 64 were males (24.1%). Students were aged from 17 to 27, with the mean being 19.9 years. The study was conducted among pre-clinical years, MBBS-1 and MBBS-2 at Rawalpindi Medical University, and 193 (72.6%) responses were recorded from MBBS-1, while 73(27.4%) from MBBS-2

Table 1 *Demographics of The Study Participants*

	Frequency	Percentage
Gender		
Male	64	24.1%
Female	202	75.9%
Age		
17-19	100	37.7%
20-22	159	59.7%
23-25	6	2.2%
26-28	1	0.37%
Year of Study		
MBBS-I	193	72.5%
MBBS-2	73	27.4%
Residence		
Day scholars	214	80.5%
Hostellites	52	19.5%

Note. Data presented as frequencies and percentages

The questionnaire adapted from a pre-published research study was used to evaluate knowledge related to hepatitis. About 177 people (66.5% strongly agreed) were sure hepatitis was caused by a virus, and that it caused liver inflammation was also reached a consensus (43.2% strongly agree, 41% agree). It was interesting to note that out of the total 266 medical students, only 38% considered healthcare workers to be at an increased risk for hepatitis B (101 strongly agree). This may highlight a need for increased awareness regarding the detrimental effects of hepatitis, especially among medical students.

Lastly, knowledge regarding preventive measures was questioned. About 52.6% believed in the efficacy of Hepatitis B vaccination, 4.5% believed in antiviral therapy, 29.7% in making sure of no cross-contamination through syringes and needles, and 21.1% by avoiding contaminated food. A positive attitude of using gloves and PPE

while handling bodily fluids was observed (54.1% strongly agree)

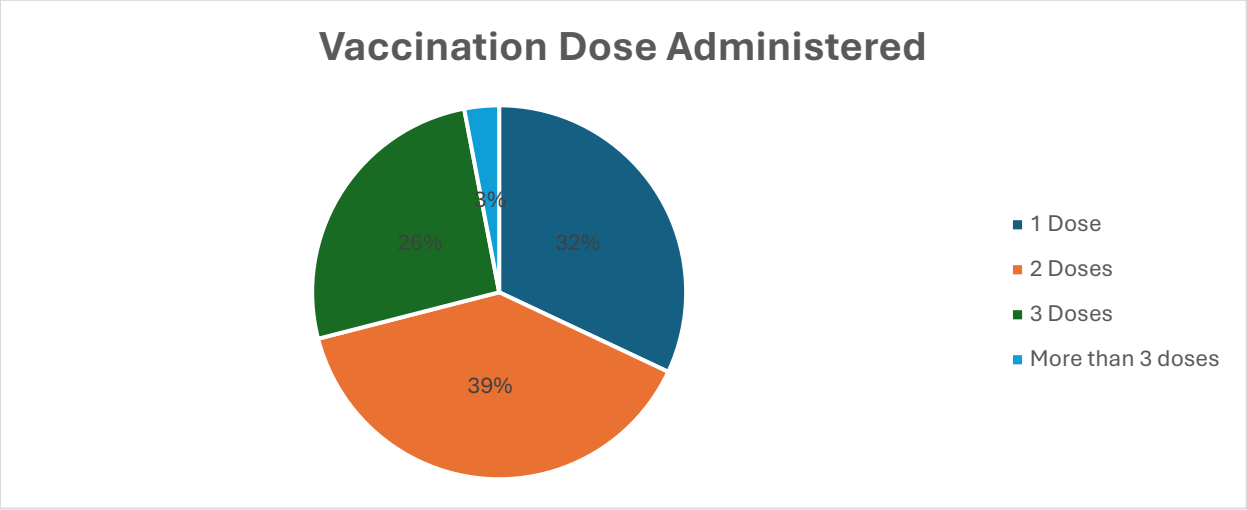
Out of the total participants, a stark 54.5% were sure that Hepatitis B vaccination should be taken by healthcare workers. Social attitude asking about hugging or shaking hands with hepatitis B affected person received mixed responses, and 34.6% of the total respondents were unsure of what to do. An overall positive attitude regarding vaccination was observed, and 45.1% believed vaccination was needed since a risk of infection in medical settings persists.

According to the data, 61.3% of people reported always asking for a new syringe before an injection, and 57.9% made sure that sterilized equipment was being used before receiving a body piercing. 50.8% did not share their razors or other sharp objects with others, and most (57.1%) practiced good physical and menstrual hygiene. Only about 21.1 % of participants reported being interested in attending webinars related to Hepatitis awareness.

The mean score across the three categories was 88 (Median 92, Mode 92, minimum 24, maximum 115).

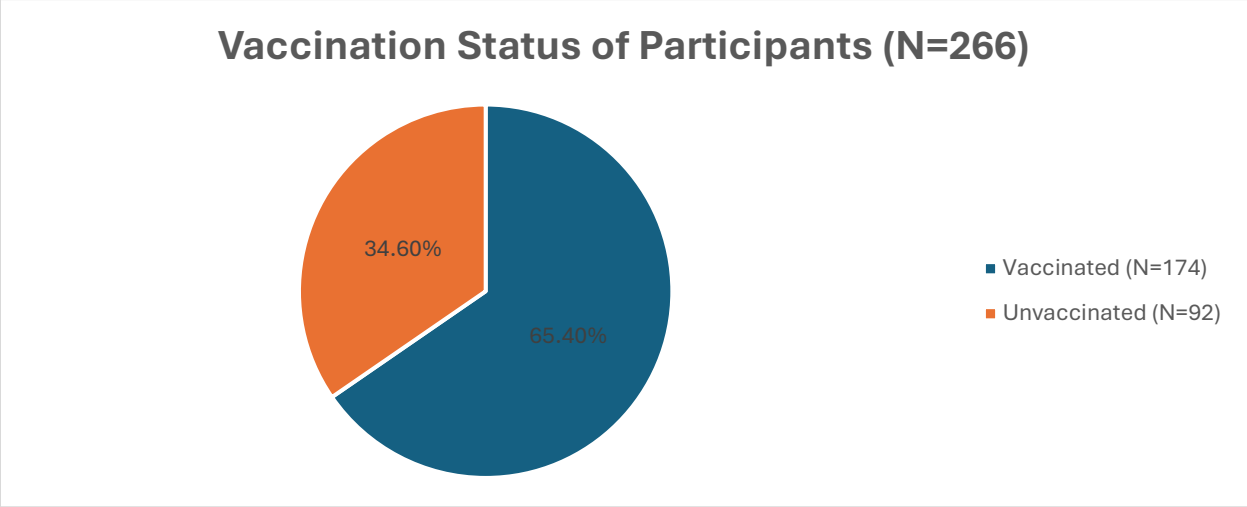
When inquired about their vaccination status, 34.6% (n=92) people reported not being vaccinated, while 174 (65.4%) were vaccinated, as shown in Figure: 2. Out of those, only 5 were completely vaccinated with their booster doses also complete. 45 had completed their three doses and were waiting for their booster dose. 69 had two doses done as of yet, and 57 had only had one dose, as shown in Figure 1. Reasons for noncompliance, as majorly reported included lack of knowledge and awareness about the necessity of Hepatitis B vaccination, and of time and resources to complete vaccination.

Figure 1 *Vaccination Dose Administered*



Note. Vaccine Doses presented as Percentages

Figure 2 *Vaccination Status*



Note. Vaccination status presented as Percentages

The data was not normally distributed as the value for both Kolmogorov-Smirnov and Shapiro Wilk tests was p=0.000. So, it was transformed to normal by using the IDF.NORMAL function, and the tests of significance were run on this normal data.

An independent samples t-test was run with a confidence interval of 95% to determine if KAP scores were greater in any group.

The results showed that females had significantly greater scores (t (263) = -3.598, p=0.000) than males. In addition, day scholars scored significantly more than hostelites. (t (263) =2.177, p=0.03). However, there was no significant difference between the scores of the students of the two years (t (263) = -1.118, p= 0.264). Pearson's correlation between age and KAP showed a significant negative relation (p=0.037)

Table 2 *Knowledge, Attitude, and Practice Scores by Gender*

	N	Mean	Std. Error Mean	p-value
Females	214	89.8785±12.48151	0.85322	
Males	52	84.9808±18.09614	2.50948	0.299

Note. Values are presented as mean (± standard deviation)

One-way ANOVA was run to determine the relation between the number of doses administered and KAP knowledge; however, there was no significant result [F(4,261)=1.228, p=0.299]. Post hoc analysis revealed no significant differences between any two groups.

Table 2 presents the Knowledge, Attitude, and Practice (KAP) scores by gender. Females (N=214) had a higher mean KAP score (89.88 ± 12.48) compared to males

(N=52) with a mean of 84.98 ± 18.10. However, the difference was not statistically significant.

Discussion

Medical students often face a high risk of being infected by hepatitis B due to their involvement in patient care early in their clinical training. This emphasizes the need for vaccination and a comprehensive understanding of the infection before beginning clinical training.[6]

Out of 266 students surveyed, about 177 students (66.5% strongly agreed) ere sure hepatitis was caused by a virus, and it causes liver inflammation also reached a consensus (43.2% strongly agree, 41% agree). In a study conducted among preclinical medical and dental students in Nepal, it was found that 93.6% of the participants were aware of the cause of Hepatitis B infection.[13] When modes of transmission were interrogated, most of the students strongly agreed that it being transmitted via contaminated body fluids (51.5%), while it being transmitted through infected needles and syringes was also agreed upon (50.8%). Transmission from mother to fetus (37.2%), unprotected sex with an infected person (41%), through casual contact (3.4%), coughing and sneezing (6.0%), and through contaminated food (18.8%) were also evaluated. The findings show a low ratio as compared to the findings of a study from Northwest Ethiopia and the study from Haramaya University, Ethiopia.[14]

Knowledge regarding preventive measures was also questioned. About 52.6% believed in the efficacy of Hepatitis B vaccination. The findings from studies conducted in Northwest Ethiopia and Saudi Arabia showed 86.5% and 84.6% affirmation of vaccine efficacy respectively.[15,16] Social attitude about hugging or shaking hands with a hepatitis B affected person received mixed responses, and 34.6% of the total respondents were unsure of what to do.

Total 41.7% believed that Hepatitis B vaccination was safe and effective, and a stark 54.5% were sure that Hepatitis B vaccination should surely be taken by healthcare workers.

Most individuals (61.3%) consistently requested a new syringe prior to injection, and 57.9% ensured that sterilized equipment was utilized before getting a body piercing. Additionally, 50.8% refrained from sharing razors or other sharp objects with others, and the majority (57.1%) maintained good physical and menstrual hygiene practices. The findings are lower compared to a study that showed higher results in the case of participants asking for a new blade for shaving/hair cutting and sterile equipment for nose/ear piercing. Only about 21.1 % of participants reported being interested in attending webinars related to Hepatitis awareness, which shows a slightly lesser proportion than the findings from Ethiopia i.e. 23.9%.[14]

The Hepatitis B vaccination status among preclinical medical students in our study was as follows: 34.6% (n=92) people reported not being vaccinated while 174 (65.4%) were vaccinated as mentioned in figure:2 ,which is quite lower than the other study done among medical students in Nepal where 86.5% of the students were vaccinated.[17]

The results showed that females had significantly greater KAP scores (t (263) = -3.598, p=0.000) compared to males, which are as per previous statistics from Pakistan. However, it contradicts the study from Malaysia which had found no association between gender and knowledge.[18] However, there was no significant difference between the scores of the students of the two years (t (263) = -1.118, p= 0.264), which is quite contradictory with the findings of a study from Pakistan where 1st professional year had the least knowledge.

It is important to highlight the limitations of our study. One major limitation being that our data was collected from a small sample size, resulting in lower statistical power compared to similar studies. Additionally, we did not measure the anti-Hepatitis B surface antibody (HBsAb) titer of the participants, which means that the vaccination status could not be verified. We also need to consider the potential impact of recall bias, information bias, and social desirability bias on the results of our study. These limitations should be considered when interpreting our findings.

Based on the findings of this study, all medical students should be required to receive Hepatitis B vaccine, supported by on-campus vaccination drives and awareness sessions to ensure both protection and understanding.

The study employed a non-random convenience sampling technique for data collection. While this method may introduce sampling bias and limit the generalizability of the findings, it was selected due to logistical constraints and the voluntary nature of participant involvement. Alternative probability-based sampling methods were not feasible given the study's limited resources and time frame.

Conclusion

The study revealed a varied response from pre-clinical year students about their knowledge in regard to Hepatitis B causes and effects. While most students were vaccinated and demonstrated positive attitudes towards vaccination, those previously unvaccinated, due to limited awareness and resource constraints, showed strong willingness to get vaccinated. This study highlights the urgent need to enhance education and awareness in future medical practitioners concerning Hepatitis B transmission, risks, negligence in practice, and prevention strategies.

References

1. Liou JW, Mani H, Yen JH. Viral Hepatitis, Cholesterol Metabolism, and Cholesterol-Lowering Natural Compounds. *IJMS*. 2022;23(7):3897. doi:10.3390/ijms23073897
2. Veracruz N, Gish RG, Cheung R, Chitnis AS, Wong RJ. Global trends and the impact of chronic hepatitis B and C on disability-adjusted life years. Liver Int. 2022 Oct;42(10):2145-2153. doi: 10.1111/liv.15347. Epub 2022 Jul 4. PMID: 35753064.
3. Li H, Yang M, Ma M, et al. Tenofovir for children and adults with chronic hepatitis B. Cochrane Hepato-Biliary Group, ed. *Cochrane Database of Systematic Reviews*. 2023;2023(9). doi:10.1002/14651858.CD015586
4. Pappas SC. Hepatitis B and Health Care Workers. Clin Liver Dis. 2021 Nov;25(4):859-874. doi: 10.1016/j.cld.2021.06.010. Epub 2021 Sep 11. PMID: 34593158.
5. Farhan M, Fazal F, Dave T, Butt A, Basit J, Maqbool S. National hepatitis registry in Pakistan: a dire need for hepatitis surveillance and control. *Trop Med Health*. 2023;51:41. doi:10.1186/s41182-023-00534-8.
6. Qureshi H, Mahmood H, Sabry A, Hermez J. Barriers and Strategies for Hepatitis B and C Elimination in Pakistan. J Infect Dis. 2023 Sep

13;228(Suppl 3):S204-S210. doi: 10.1093/infdis/jiad022. PMID: 37703344.
7. Pan CQ, Dai E, Mo Z, Zhang H, Zheng TQ, Wang Y, Liu Y, Chen T, Li S, Yang C, Wu J, Chen X, Zou H, Mei S, Zhu L. Tenofovir and Hepatitis B Virus Transmission During Pregnancy: A Randomized Clinical Trial. JAMA. 2025 Feb 4;333(5):390-399. doi: 10.1001/jama.2024.22952. PMID: 39540799; PMCID: PMC11565373.
8. Hussein NA, Ismail AM, Jama SS. Assessment of Hepatitis B Vaccination Status and Associated Factors among Healthcare Workers in Bosaso, Puntland, Somalia 2020. Komatsu H, ed. *BioMed Research International*. 2022;2022:1-7. doi:10.1155/2022/9074294
9. Soomar SM, Siddiqui AR, Azam SI, Shah M. Determinants of hepatitis B vaccination status in health care workers of two secondary care hospitals of Sindh, Pakistan: a cross-sectional study. Hum Vaccin Immunother. 2021 Dec 2;17(12):5579-5584. doi: 10.1080/21645515.2021.1986332. Epub 2021 Nov 10. PMID: 34757865; PMCID: PMC8903980.
10. Shah SM, Rodin H, Pogemiller H, Magbagbeola O, Ssebambulidde K, Zewde A, Goers M, Katz B, Obaitan I, Abdo EF, Hassany SM, Elbadry M, Moussa AM, Mtengezo J, Dedzoe M, Henkle B, Bah MB, Sabongi M, Kayandabila J, Fell R, Ijeoma I, Ochola L, Yousif M, Debes JD. Hepatitis B Awareness and Vaccination Patterns among Healthcare Workers in Africa. Am J Trop Med Hyg. 2020 Dec;103(6):2460-2468. doi: 10.4269/ajtmh.20-0521. Epub 2020 Oct 1. PMID: 33025875; PMCID: PMC7695068.
11. Burnett RJ, Dramowski A, Amponsah-Dacosta E, Meyer JC. Increasing hepatitis B vaccination coverage of healthcare workers - global lessons for South Africa. Curr Opin Immunol. 2021 Aug;71:6-12. doi: 10.1016/j.coi.2021.03.010. Epub 2021 Apr 2. PMID: 33819774.
12. Altamimi A, Alqahtani T, Ahmed J, et al. Knowledge, awareness, and vaccination compliance of hepatitis B among medical students in Riyadh's governmental universities. *J Family Med Prim Care*. 2021;10(1):485. doi:10.4103/jfmpc.jfmpc_1419_20
13. Shrestha DB, Khadka M, Khadka M, Subedi P, Pokharel S, Thapa BB. Hepatitis B vaccination status and knowledge, attitude, and practice regarding Hepatitis B among preclinical medical students of a medical college in Nepal. Chemin I, ed. *PLoS ONE*. 2020;15(11):e0242658. doi:10.1371/journal.pone.0242658
14. Mesfin YM, Kibret KT. Assessment of Knowledge and Practice towards Hepatitis B among Medical and Health Science Students in Haramaya University, Ethiopia. Schildgen O, ed. *PLoS ONE*. 2013;8(11):e79642. doi:10.1371/journal.pone.0079642
15. Abdela A, Woldu B, Haile K, Mathewos B, Deressa T. Assessment of knowledge, attitudes and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. *BMC Res Notes*. 2016;9(1):410. doi:10.1186/s13104-016-2216-y
16. Albadrani MS, Abdulaal AM, Aljabri AM, Aljohani SS, Aljohani SF, Sindi MA, Jan HK, Alsaedi H, Alamri WM, Alharbi AM, Alraddadi AA. Knowledge, Attitudes, and Practices Toward the Prevention of Hepatitis B Virus Infection Among Medical Students in Medina City, Kingdom of Saudi Arabia. Cureus. 2023 Nov 15;15(11):e48845. doi: 10.7759/cureus.48845. PMID: 38024059; PMCID: PMC10650944.
17. Bhattarai S, KC S, Pradhan PM, Lama S, Rijal S. Hepatitis B vaccination status and Needle-stick and Sharps-related Injuries among medical school students in Nepal: a cross-sectional study. *BMC Research Notes*. 2014;7(1):774. doi:10.1186/1756-0500-7-774
18. Ahmad A, Munn Sann L, Abdul Rahman H. Factors associated with knowledge, attitude and practice related to hepatitis B and C among international students of Universiti Putra Malaysia. *BMC Public Health*. 2016;16(1):611. doi:10.1186/s