Scientific Research Publishing

Open Journal of Epidemiology, 2026, 16(2), 238-251
https://www.scirp.org/journal/ojepi
ISSN Online: 2165-7467
ISSN Print: 2165-7459

Study of Knowledge, Attitudes and Practices of Students at Kankou Moussa University Regarding Hepatitis B Virus in 2025

Oumar Sangho[1], Abdoul Salam Diarra[2*], Fanta Sangho[1,3], Sata Doumbia[1], Abou Sogodogo[4], Salia Keita[1], Housseini Dolo[1], Cheick Abou Coulibaly[1], Nouhoum Telly[1], Borodjan Diarra[5], Yeya Dit Sadio Saro[1], Lancina Doumbia[1], Hamadoun Sangho[3]

[1]Department of Education and Research in Public Health and Specialties, University of Sciences, Technique and Technologies of Bamako, Bamako, Mali
[2]National Center for Scientific and Technological Research, Bamako, Mali
[3]Faculty of Pharmacy, University of Sciences, Technique and Technologies of Bamako, Bamako, Mali
[4]University Clinical Research Center, University of Sciences, Techniques and Technologies of Bamako, Bamako, Mali
[5]General Directorate of Health and Public Hygiene, Ministry of Health and Social Development, Bamako, Mali
Email: *abdoulsalamdiarra@gmail.com

How to cite this paper: Sangho, O., Diarra, A.S., Sangho, F., Doumbia, S., Sogodogo, A., Keita, S., Dolo, H., Coulibaly, C.A., Telly, N., Diarra, B., Saro, Y.S., Doumbia, L. and Sangho, H. (2026) Study of Knowledge, Attitudes and Practices of Students at Kankou Moussa University Regarding Hepatitis B Virus in 2025. *Open Journal of Epidemiology*, **16**, 238-251.
https://doi.org/10.4236/ojepi.2026.162018

Received: January 4, 2026
Accepted: March 7, 2026
Published: March 10, 2026

Abstract

Introduction: Viral hepatitis B (HBV) is a major public health problem worldwide and particularly in sub-Saharan Africa. Health sciences students, who are the future actors in the health system, are exposed to a significant risk of infection during their training. This study aimed to assess the level of knowledge, attitudes and practices of students at Kankou Moussa University (UKM) regarding hepatitis B virus in 2024-2025. **Methodology:** This was a cross-sectional study conducted from January 1 to December 18, 2025, among 425 medical and pharmacy students. Data were collected using a structured questionnaire and analyzed using SPSS version 25.0 software. Anonymity and confidentiality were ensured. **Results:** The mean age of the participants was 21.25 ± 2.64 years, and females accounted for 60.9% of the sample. More than half of the students (50.1%) had good knowledge of HBV; 88.7% demonstrated a favorable attitude toward prevention, and 51.3% adopted good preventive practices. Statistically significant associations were observed between students' knowledge and level of education (aOR = 0.30; 95% CI: 0.11 - 0.78), between students' attitudes and age (aOR = 0.31; 95% CI: 0.10 - 0.98) as well as level of education, and between students' practices and close contact with parents or relatives affected by HBV (aOR = 0.58; 95% CI: 0.34 - 0.98). **Conclusion:** This study reveals that more than half of the students demonstrated good levels of knowledge, attitudes, and practices. However, preventive measures against viral hepatitis B among students, particularly screening and vaccination, were

low. General biosafety practices did not comply with recommended standards. The level of education significantly influenced both knowledge and attitudes. Therefore, it is necessary to implement an annual HBV screening and vaccination campaign for students, accompanied by information and awareness-raising sessions.

Keywords

Hepatitis B Virus, Knowledge, Attitudes, Practices, Health Sciences Students, Kankou Moussa University, Mali

1. Introduction

Hepatitis B is a potentially fatal viral infection caused by a hepatotropic virus, the hepatitis B virus (HBV) [1]. It represents a major public health problem worldwide and affected an estimated 254 million people in 2022, with approximately 1.5 million new infections occurring each year [2]-[5].

In Africa, the prevalence of chronic hepatitis B in the general population was estimated at 5.8% in 2022 [2]-[5].

In Mali, its prevalence in the general population was estimated at 12.1% in 2020, corresponding to approximately 2,500,000 infected individuals [2]-[5].

The risk of exposure to HBV among health students constitutes a major concern. Approximately two million health professionals are exposed to blood-borne viral diseases each year, resulting to nearly 70,000 infections caused by hepatitis B virus (HBV) [6]. Health students, who are frequently in contact with blood and other bodily fluids during their training, are particularly exposed to the risk of infection with blood-borne viral diseases such as HBV, partly due to inadequate knowledge, attitudes, and practices regarding HBV [7] [8].

Considering the importance of adequate knowledge and appropriate attitude in the prevention of HBV infection [9], assessing health sciences students' knowledge, attitudes and practices regarding HBV is essential for identifying effective strategies to minimize their risk of exposure [10]. Given that disease prevention practices are generally associated with the level of knowledge and attitudes, conducting studies to identify gaps in knowledge, attitudes, and practices (KAP) represents a critical first step in prevention planning. Indeed, the results of such studies allow the development of targeted strategies to effectively improve the knowledge, attitudes, and practices of future health professionals. In this context, we conducted this study to evaluate the knowledge, attitudes, and practices of students at Kankou Moussa University (UKM) in Bamako regarding viral hepatitis B.

2. Methodology

2.1. Study Location

The study was conducted at Kankou Moussa University in Bamako. Established

in 2009, Kankou Moussa University had a total of 837 students during the 2024-2025 academic year, distributed across 13 levels. Pharmacy training comprises 6 levels (1st to 6th year) with a total of 309 students, while the medical program comprises 7 levels (1st to 7th year) with 528 students.

2.2. Type and Period of Study

This was a cross-sectional study conducted over a 12-month period, from January 1 to December 18, 2025.

2.3. Study Population

The study population consisted of students enrolled at Kankou Moussa University.

2.3.1. Inclusion Criteria

- Students enrolled at Kankou Moussa University (UKM) for the 2024-2025 academic year.
- Students who voluntarily agreed to participate in the survey.

2.3.2. Non-Inclusion Criteria

- Students who were unavailable during the survey period.
- Students enrolled at Kankou Moussa University (UKM) who did not have a mobile phone number or a WhatsApp account.

2.3.3. Sampling

1) Sampling Technique

We employed stratified random sampling based on the number of students, with each class constituting a stratum. The sample size was allocated proportionally according to the number of students in each class. Within each stratum, participants were selected using a random draw.

We ensured that the desired sample size was achieved in each class to maintain representativeness of the population. If the target number of participants was not reached in a given class, the shortfall was compensated by selecting additional students from other classes. The estimated sample size for the study was 424 students, distributed proportionally between pharmacy and medicine programs (see sample size calculation results). Accordingly, 157 participants were selected from pharmacy and 267 from medicine (Table 1). The allocation of participants to each class was performed as follows:

Step 1: Calculate the percentage of students in each class based on the total number of students and the number of students per class.

- 837 ----------→ 100%
- Number per class----------→ X%/class

Step 2: Calculate the sample size for each stratum (class) based on the percentage obtained and the total sample size.

- 100% ----------→ total sample
- X%/class ----------→ X students/class

Table 1. Number of samples per class.

Level of study	Sample per class	
	Pharmacy	Medicine
1st Year	38	76
2nd Year	34	51
3rd Year	34	42
4th Year	17	34
5th Year	21	30
6th Year	13	17
7th Year	0	17
Total	157	267

2) Sample size calculation

Assuming that approximately half of the students had good knowledge, attitudes, and practices (with a margin of error of 5%), and based on a 95% confidence interval (95% CI), as suggested by models in the literature [11] [12], the sample size was calculated using the Daniel Schwartz formula.

$$n = \frac{p \times q}{i^2}(Z\alpha)^2$$

n = sample size;

P = 50% (proportion of the event in a previous study);

I = desired precision (5%);

$Q = 1 - P$;

$Z\alpha$ =1.96 (test de l'écart réduit); $Z\alpha = 1.96$ pour $\alpha = 5\%$).

$$n = \frac{0.5 \times 0.5}{(0.05)^2}(1.96)^2, \quad n = 385$$

To account for potential non-response, 10% was added to the minimum calculated sample size, resulting in a final sample size of $n = 424$.

2.4. Categorization of the Level of Knowledge: Attitude and Practice of Students

The questionnaire was developed based on the literature. Questions assessing students' level of knowledge, attitudes, and practices were evaluated using 34, 10, and 9 items, respectively, in accordance with data from the literature [13] [14].

We assigned scores based on the answers to the questions asked. Thus, any correct response was scored 1 point and 0 points for any incorrect response.

The grades obtained were then dichotomized into good and bad according to a model from the literature [13] [14]. The score obtained by the participants was considered good if it was greater than or equal to 70% (≥70%) for each KAP section and poor if it was less than 70% (<70%).

For the categorization of knowledge level, students who achieved 24 or more

correct responses out of 34 (≥70%) were considered to have good knowledge, whereas those with fewer than 24 correct responses were considered to have poor knowledge of hepatitis B.

Concerning the attitude assessment, students who provided at least 7 correct responses out of the 10 expected were considered to have a "good attitude", whereas those who obtained fewer than 7 correct responses were classified as having a "poor attitude".

For the practice evaluation, students who correctly answered at least 6 out of the 9 questions were considered to have "good practice". Those who provided fewer than 6 correct responses were classified as having "poor practice".

2.5. Variables Studied

The variables included were sex, training program, level of study, knowledge of HBV, contagiousness of HBV, modes of transmission, means of prevention, complications of hepatitis B, treatment, diagnosis, and screening; students' attitudes toward hepatitis B; students' behavioral practices regarding hepatitis B; family history of HBV; and experience in providing care or treatment.

2.6. Data Collection and Tools Used

Data were collected online using smartphones through a survey link created with Google Forms. The questionnaire link was distributed electronically via WhatsApp. After data collection, the responses were exported to a Microsoft Excel file to create the study database. The data base was then cleaned prior to analysis.

2.7. Data Analysis Plan

The collected data were analyzed using SPSS software version 27.0.1. The analysis was conducted in three stages:

- **Descriptive analysis:** This consisted of describing the study sample. Quantitative variables were expressed as means and standard deviations, while qualitative variables were presented as percentages.
- **Univariate analysis:** This analysis examined associations between dependent variable variables (KAP) and various independent variables. Pearson's chi-square test and Fisher's exact test were used as appropriate.
- **Multivariate analysis:** Binary logistic regression was used in the final model to identify factors independently associated with students' KAP. Explanatory variables with a p-value ≤ 0.20 in the univariate analysis were included in the multivariate logistic regression model. Statistical significance was set at $p < 0.05$.

2.8. Ethical and Deontological Considerations

Permission was obtained from the university authorities prior to the conduct of the study. Participants were informed about the objectives and purpose of the study. Participation was voluntary and based on free and informed consent. An-

onymity and confidentiality were guaranteed throughout the study process.

3. Results

3.1. Sociodemographic Characteristics

A total of 425 students participated in the study. The mean age was 21.25 ± 2.64 years and 18 - 24 age group accounted for 78.5% (n = 334) of the sample. Among the participants, 60.9% (n = 259) were female, and 64.2% (n = 273) were enrolled in the medical program. First-, second-, and third-year students represented 28.2% (n = 120), 21.2% (n = 90), and 18.6% (n = 79) of the sample, respectively.

3.2. Knowledge of Kankou Moussa University Students on Viral Hepatitis B

Overall, 91.8% of students correctly identified the causative agent, 73.4% knew the modes of transmission, 74.8% were aware of prevention methods, and 60.9% understood the objectives of curative treatment. Only 28.0% recognized that newborns are a high-risk group for developing chronic hepatitis B, and 44.5% were aware of the main complications, including liver failure, cirrhosis, liver cancer, and premature death (Table 2).

Table 2. General knowledge of Kankou Moussa university students about hepatitis B in 2024-2025 (n = 425).

Variables	n	%
Knowledge of hepatitis B	394	92.7
Causal agent of hepatitis (virus)	390	91.8
Organ affected by HBV (liver)	412	96.9
Impact of hepatitis B on liver function	405	95.3
Age group most at risk of developing chronic hepatitis B (neonates)	119	28.0
Perceived effects of HBV (cancer. cirrhosis. liver failure. premature death)	189	44.5
Risk of mortality linked to complications of untreated chronic hepatitis B (High risks of premature death)	309	72.7
Knowledge of transmission methods	312	73.4
Knowledge of prevention methods	318	74.8
Knowledge of the objectives of curative treatment	259	60.9

3.3. Attitudes of Kankou Moussa University Students towards the Hepatitis B Virus

Regarding occupational risk, 67.3% of students reported fearing infection feared being infected with HBV, 64.2% perceived themselves to be at higher risk than the general population and 57.9% were aware of the risk during their practical training. Conversely, only 29.9% felt confident in managing a patient with hepatitis B (Table 3).

Table 3. Attitudes of UKM students towards the hepatitis B virus in 2024-2025 (n = 425).

Variables	n	%
Importance of hepatitis B as a public health problem in Mali	389	91.5
Perception the Safety of the Hepatitis B Vaccine	359	84.5
Perception of the need to vaccinate newborns against hepatitis B at birth	370	87.1
Health workers' fear of infection with hepatitis B virus	286	67.3
Perception of risk of hepatitis B virus infection among health workers compared to the general population	273	64.2
Perception of risk of hepatitis B virus infection among Health Workers during practical training	246	57.9
Health workers' confidence in managing patients with Hepatitis B	127	29.9
Perception of the effectiveness of infection control guidelines in protecting against hepatitis B virus	375	88.2
Perception of the importance of hepatitis B information for health professionals and health sciences students	415	97.6
Perception of the need to offer training programs on the occupational risk of hepatitis B virus to all health students	414	97.4

3.4. Practices of Kakou Moussa University Students Regarding the Hepatitis B Virus

In our study, 29.9% of students reported having been screened for HBV, and 45.6% had received vaccination. Regarding biosafety practices, 56.7% disposed of medical waste in appropriate medical bags, 29.9% discarded needles without recapping them, and 56.9% reported occasionally working without personal protective equipment (Table 4).

Table 4. Behavioral practices of Kankou Moussa university students regarding viral hepatitis B in 2024-2025, (n = 425).

Variables	n	%
Performing a hepatitis B virus screening test	127	29.9
Willingness to undergo treatment following a positive hepatitis B virus test	403	94.8
Hepatitis B vaccination status	194	45.6
Safe disposal practices for blood-contaminated objects and instruments, regardless of infection source	241	56.7
Practice of consistently wearing gloves during biological procedures	354	83.3
Practice of consistently wearing gloves when administering injections or infusions	316	74.4

Continued

Occasional work without personal protective equipment (PPE)	183	56.9
Reporting needle stick incidents to supervisors	387	91.1
Measures taken to prevent needle stick injuries		
a) Wash hands with soap or disinfectant after each clinical procedure?	79	18.6
b) Recap the needle with both hands after use and immediately dispose of it in a puncture-resistant sharps container	219	51.5
c) Do not recap the needle and immediately discard it in a puncture-resistant sharps container	127	29.9

3.5. Knowledge Scores, Attitude, Practice of Kankou Moussa University Students Facing the Hepatitis B Virus in 2024-2025

The results showed that 50.1% of students had good knowledge, 88.7% demonstrated a favorable attitude, and 51.3% exhibited good practices related to hepatitis B (Figure 1).

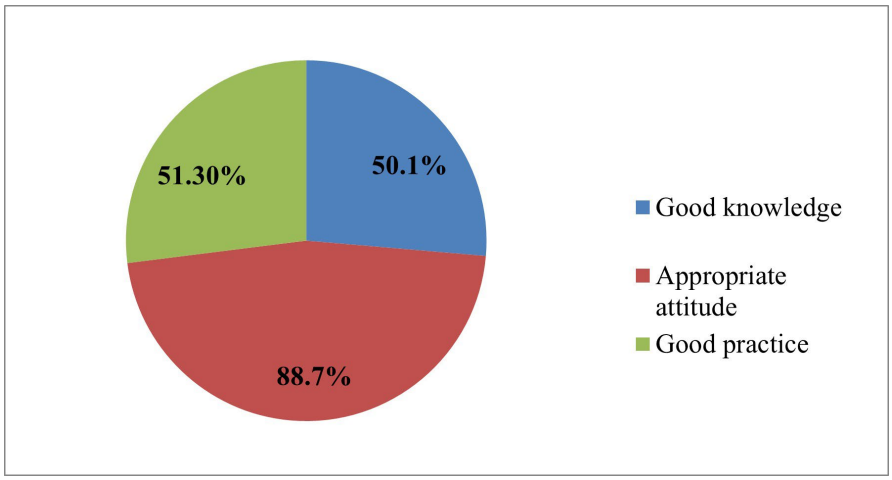

Figure 1. Knowledge attitude and practice scores of Kankou Moussa university students regarding hepatitis B virus.

3.6. Factors Associated with Students' Knowledge, Attitude and Practice

Multivariate analysis revealed a statistically significant association between students' knowledge and educational level in favor of 4th year (aOR = 0.30; 95% CI [0.11 - 0.78]). Student attitude was associated with age favoring the 18 - 24-year age group(aOR = 0.31, 95% CI [0.10 - 0.98]) educational level, favoring 2nd-year (aOR = 0.14; 9% CI [0.04 - 0.49]) and 3rd year students (aOR = 0.16; 95% CI [0.05 - 0.56]) and having participated in the care of hepatitis B virus (aOR = 2.18; 95% CI [1.14 - 4.16]. Students' practice was associated with proximity to family members affected by HBV (ORa = 0.58; IC95% [0.34 - 0.98]) (Table 5).

Table 5. Distribution of factors associated with the knowledge, attitude and practice among Kankou Moussa university students in 2024-2025.

Variable	Knowledge		Attitude		Pratictitice	
	aOR*	[IC 95%]	aOR*	[IC 95%]	aOR*	[IC 95%]
Age range						
16 - 18	1.85	[0.33 - 10.3]	0.22	[0.04 - 1.08]	0.85	[0.15 - 4.87]
18 - 24	0.74	[0.14 - 3.80]	0.31	[0.10 - 0.98]	1.05	[0.19 - 5.70]
24 - 30	0.62	[0.11 - 3.34]	-	Ref (24-35)	0.78	[0.14 - 4.35]
30 - 35	-	Ref	-	-		Réf
Level of training						
1re	0.62	[0.23 - 1.68]	0.38	[0.12 - 1.17]	1.48	[0.52 - 4.21]
2e	0.79	[0.32 - 1.94]	0.14	[0.04 - 0.49]	0.99	[0.35 - 2.83]
3e	0.58	[0.22 - 1.50]	0.16	[0.05 - 0.56]	0.72	[0.25 - 2.09]
4e	0.3	[0.11 - 0.78]	0.47	[0.09 - 2.44]	0.44	[0.14 - 1.34]
5e	0.47	[0.17 - 1.27]		Ref	0.57	[0.19 - 1.73]
6e	0.41	[0.12 - 1.35]		-	0.51	[0.14 - 1.85]
7e		Ref		-		Ref
Having a parent/relative affected by HBV						
No		Ref		Ref		Ref
Yes	0.69	[0.43 - 1.12]	1.29	[0.58 - 2.84]	0.58	[0.34 - 0.98]
Having experience caring for HBV+ patients						
No		Ref		Ref		Ref
Yes	0.95	[0.15 - 1.23]	2.18	[1.14 - 4.16]	0.88	[0.57 - 1.35]

aOR*: Adjusted Odds Ratio.

4. Discussion

Knowledge of Hepatitis B among Kankou Moussa university students

Slightly more than half of the students demonstrated good knowledge of viral hepatitis B. This knowledge varied according to the level of study. Specifically, students in years below the 7th year had a lower likelihood of possessing good knowledge of HBV compared to 7th-year students.

This finding suggests that the acquisition of knowledge about HBV is progressive, increasing with the level of study. Similar observations have been reported by Mursy and Mohamed (2019) [15]. Furthermore, the results of studies conducted in Morocco by Bentouhami MR *et al.* (2019) and in Jordan by Alaridah N *et al.* (2024) are consistent with our findings [16] [17].

Regarding these gaps in knowledge about hepatitis B, our study found that only a minority of participants recognized that newborns are the age group most at risk of developing chronic hepatitis B, reflecting a limited understanding of the disease's progression by age. Furthermore, fewer than half of the students were aware

of the main complications, including cirrhosis, liver cancer, liver failure, and premature death. A study conducted in Vietnam by Nguyen *et al.* (2021) reported that 44.5% of students recognized newborns as the most at-risk group and 88.4% were aware of complications associated with chronic hepatitis B, a result likely attributable to their prior training in infectious diseases and epidemiology [18]. Furthermore, a substantial proportion of participants (over one-third) incorrectly believed that hepatitis B virus could be transmitted through coughing, sneezing, or by sharing utensils and food. In contrast, the study by Nguyen *et al.* (2021) reported much lower rates (13.5% and less than 6%, respectively), which may be explained by the more advanced level of the students included in their study. Regarding the prevention of mother-to-child transmission, half of the students in our study recognized the importance of administering the hepatitis B vaccine. The Vietnamese studies by Nguyen *et al.* (2021) reported 95.7% of students were aware of HBV [18]. Furthermore, the combined strategy recommended by the WHO, consisting of the administration of hepatitis B-specific immunoglobulin (HBIG) along with three doses of vaccine to infants born to infected mothers—remained poorly known, with fewer than half of the students correctly identifying it.

Regarding testing, awareness of at-risk groups such as men who have sex with men (MSM) and people living with HIV was low. Similarly, few students were aware that chronic hepatitis B is most often asymptomatic. The study by Mohan B Sannathimmappa (2019) reported that 50.8% of students were aware that chronic hepatitis B can be asymptomatic [19]. Regarding postnatal follow-up, only a small proportion of students knew that serological testing of infants born to HBsAg-positive mothers should be performed at 12 months. These findings highlight a substantial gap in students' understanding of screening and post-vaccination monitoring. Regarding treatment, only a small proportion of students identified the inhibition of viral replication and the prevention of mother-to-child transmission as key therapeutic objectives. In contrast, the study by Alaridah *et al.* (2024) reported much higher proportions (86.6% and 87.7%, respectively) [17], likely due to the more advanced level of the students included in that study.

Attitudes of Kankou Moussa university students towards hepatitis B

Factors significantly associated with students' attitudes included age, educational level, and practical experience. Younger students (18 - 24 years) were less likely to adopt a favorable attitude compared to those aged 30 - 35 years. This observation may be explained by the fact that students' maturity and clinical experience influence their attitudes and practices. In addition, 2nd- and 3rd-year students exhibited significantly less favorable attitudes compared to those at higher levels of study. This highlights the role that progression through the curriculum plays in the adoption of appropriate behaviors. Studies conducted in Jordan by Alaridah N *et al.* (2024) and in Ethiopia by Gebremeskel T *et al.* (2020) reported that students' attitudes improved with advancing levels of study [17] [20]. Students who had practical experience caring for patients with HBV were

more likely to exhibit a favorable attitude than those without such experience. Similarly, a study conducted by Adenlewo OJ *et al.* (2018) in Nigeria reported an improvement in preventive attitudes following practical experience [21].

Practices of Kankou Moussa university students regarding hepatitis B

Our results revealed a low uptake of hepatitis B screening, with only a minority of participants reporting having been tested, despite a strong willingness to undergo treatment if found positive. This low level of screening practice may be explained by the fact that most students were unaware of the availability of free screening. Similarly, the vaccination rate was low, markedly below international recommendations [22] and lower than rates reported in other studies [23]-[27]. The main factor associated with good practices regarding viral hepatitis B among students was proximity to individuals infected with HBV. Students without a family member or close relative affected by HBV were less likely (42%; 95% CI [0.34 - 0.98]) to adopt appropriate practices compared to those with a family history of the infection. This finding is consistent with results reported by Adenlewo *et al.* (2018) in Nigeria [21].

5. Conclusion

This study shows that more than half of the students demonstrated good levels of knowledge, attitude, and practices. However, preventive measures against hepatitis B (screening and vaccination) among students were low. General biosafety practices did not meet established standards. The level of education significantly influenced both knowledge and attitude. It is therefore necessary to implement an annual HBV screening and vaccination campaign for students, accompanied by information and awareness sessions.

6. Limitations of the Study

The inclusion of students from the first to the second year may have influenced the overall results, particularly with respect to their level of knowledge and preventive practices. These students, who had not yet begun clinical activities or hospital internships, generally possessed limited theoretical knowledge of viral hepatitis B and its associated occupational risks. Consequently, their inclusion may have led to an underestimation of the overall levels of knowledge, attitudes, and practices.

Information bias, particularly social desirability bias, may have occurred due to the use of a self-administered questionnaire via Google Forms, with some students providing answers they perceived as socially acceptable rather than reflecting their true perceptions or behaviors. Despite these limitations, this study provides valuable insights into the knowledge, attitudes, and practices regarding viral hepatitis B among Kankou Moussa University students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Kamdem Kamgaing, A.B. (2021) Etude des connaissances des étudiants de la Faculté de Médecine et d'odonto-stomatologie de Bamako sur l'hépatite B. Ph.D. Thesis, Université des Sciences, des Techniques et des Technologies de Bamako. https://www.bibliosante.ml/handle/123456789/4711

[2] Organisation mondiale de la Santé (2025) Principaux repères sur l'hépatite B. https://www.who.int/fr/news-room/fact-sheets/detail/hepatitis-b?utm_source=chatgpt.com

[3] Diarra, M. (2025) Journée mondiale contre l'hépatite 2024: Le Mali s'engage à briser les barrières pour éliminer les hépatites virales. Agence Malienne de Presse et Publicité. https://amap.ml/journee-mondiale-contre-lhepatite-2024-le-mali-sengage-a-briser-les-barrieres-pour-eliminer-les-hepatites-virales/

[4] Anzouan-Kacou, H.Y.K., Dehinsala, M., Bangoura, A.D., Kouamé, D.H., Doffou, A.S., Bathaix Yao, F. and Attia, A.K. (2022) Aspects socio-économiques de la prise en charge des hépatites virales chroniques en Côte-d'Ivoire. *Annales Africaines de Médecine*, **15**, e4770-e4778. https://dx.doi.org/10.4314/aamed.v15i4.3

[5] L'Afrique invitée à imiter l'Egypte pour combattre les hépatites. Afrique Sub-Saharienne. https://www.scidev.net/afrique-sub-saharienne/news/lafrique-invitee-a-imiter-legypte-pour-combattre-les-hepatites/

[6] Wilburn, S.Q. and Eijkemans, G. (2013) Prévenir les blessures par piqûre d'aiguille chez les professionnels de santé: Une col-laboration OMS-CI. *Revue internationale de santé au travail et de l'environnement*, **10**, 451-456. https://www.tandfonline.com/doi/abs/10.1179/oeh.2004.10.4.451

[7] Tarantola, A., Abiteboul, D. and Rachline, A. (2006) Infection Risks Following Accidental Exposure to Blood or Body Fluids in Health Care Workers: A Review of Pathogens Transmitted in Published Cases. *American Journal of Infection Control*, **34**, 367-375. https://doi.org/10.1016/j.ajic.2004.11.011

[8] Ciorlia, L.A.S. and Zanetta, D.M.T. (2005) Hepatitis B in Healthcare Workers: Prevalence, Vaccination and Relation to Occupational Factors. *Brazilian Journal of Infectious Diseases*, **9**, 384-389. https://doi.org/10.1590/s1413-86702005000500005

[9] Singhal, V., Bora, D. and Singh, S. (2009) Hepatitis B in Health Care Workers: Indian Scenario. *Journal of Laboratory Physicians*, **1**, 41-48. https://doi.org/10.4103/0974-2727.59697

[10] Dantoumé, T.O., Boubakary, G., Hamidou, A., Abdoulaye, B., Arouna, D., Tenimba, M., Mahamadou, C. and Cheick, B.Z. (2023) Knowledge, Attitudes and Practices of Adolescents Related to Contraception in the School Environment in Commune V of the District of Bamako. *Health Sciences and Disease*, **24**, 77-81.

[11] Berthé, A. (2021) Portage de l'AgHBs chez les adolescents dans le centre de santé de référence de Kadiolo. Thesis, Université des Sciences, des Techniques et des Technologies de Bamako. https://www.bibliosante.ml/handle/123456789/5055

[12] Angelo, A.A., Teketelew, B.B., Berta, D.M., Chane, E., Cherie, N., Nigus, M., *et al.* (2024) Knowledge, Attitude, and Practices Towards Hepatitis Infection and Its Associated Factors among Adults in Gondar Town, Northwest Ethiopia; a Community-Based Study, 2021. *Journal of Health, Population and Nutrition*, **43**, Article No. 178. https://doi.org/10.1186/s41043-024-00654-9

[13] Alaridah, N., Joudeh, R.M., Al-Abdallat, H., Jarrar, R.F., Ismail, L., Jum'ah, M., *et al.* (2023) Knowledge, Attitude, and Practices toward Hepatitis B Infection among

Healthcare Students—A Nationwide Cross-Sectional Study in Jordan. *International Journal of Environmental Research and Public Health*, **20**, Article 4348. https://doi.org/10.3390/ijerph20054348

[14] Abdela, A., Woldu, B., Haile, K., Mathewos, B. and Deressa, T. (2016) Assessment of Knowledge, Attitudes and Practices toward Prevention of Hepatitis B Virus Infection among Students of Medicine and Health Sciences in Northwest Ethiopia. *BMC Research Notes*, **9**, Article No. 410. https://doi.org/10.1186/s13104-016-2216-y

[15] Mursy, S.M.M. and Mohamed, S.O.O. (2019) Knowledge, Attitude, and Practice Towards Hepatitis B Infection among Nurses and Midwives in Two Maternity Hospitals in Khartoum, Sudan. *BMC Public Health*, **19**, Article No. 1597. https://doi.org/10.1186/s12889-019-7982-8

[16] Bentouhami, M.R., Chakib, A. and El Fane, M. (2019) Hepatitis B Knowledge, Attitudes and Practices among Moroccan College Students. *Revue d'Épidémiologie et de Santé Publique*, **67**, 397-402. https://doi.org/10.1016/j.respe.2019.06.002

[17] Alaridah, N., Jarrar, R.F., Joudeh, R.M., Al-Abdallat, H., Ismail, L., Alnajjar, Z., *et al.* (2024) Knowledge Gaps and Determination of Attitude and Practice among Medical Students toward Hepatitis B Infection: A Nationwide Cross-Sectional Study. *International Journal of Hepatology*, **2024**, Article ID: 2730516. https://doi.org/10.1155/2024/2730516

[18] Nguyen, T.T.L., Pham, T.T.H., So, S., Hoang, T.H.V., Nguyen, T.T.U., Ngo, T.B., *et al.* (2021) Knowledge, Attitudes and Practices toward Hepatitis B Virus Infection among Students of Medicine in Vietnam. *International Journal of Environmental Research and Public Health*, **18**, Article 7081. https://doi.org/10.3390/ijerph18137081

[19] Sannathimmappa, M.B., Nambiar, V. and Arvindakshan, R. (2019) Hepatitis B: Knowledge and Awareness among Preclinical Year Medical Students. *Avicenna Journal of Medicine*, **9**, 43-47. https://doi.org/10.4103/ajm.ajm_164_18

[20] Gebremeskel, T., Beshah, T., Tesfaye, M., Beletew, B., Mengesha, A. and Getie, A. (2020) Assessment of Knowledge and Practice on Hepatitis B Infection Prevention and Associated Factors among Health Science Students in Woldia University, Northeast Ethiopia. *Advances in Preventive Medicine*, **2020**, Article ID: 9421964. https://doi.org/10.1155/2020/9421964

[21] Adenlewo, O.J., Adeosun, P.O. and Fatusi, O.A. (2017) Medical and Dental Students' Attitude and Practice of Prevention Strategies against Hepatitis B Virus Infection in a Nigerian University. *Pan African Medical Journal*, **28**, Article 33. https://doi.org/10.11604/pamj.2017.28.33.11662

[22] World Health Organization (2022) Implementation Guide for Vaccination of Health Workers. World Health Organization. https://www.who.int/publications/i/item/9789240052154

[23] Tesfa, T., Hawulte, B., Tolera, A. and Abate, D. (2021) Hepatitis B Virus Infection and Associated Risk Factors among Medical Students in Eastern Ethiopia. *PLOS ONE*, **16**, e0247267. https://doi.org/10.1371/journal.pone.0247267

[24] Shao, E.R., Mboya, I.B., Gunda, D.W., Ruhangisa, F.G., Temu, E.M., Nkwama, M.L., *et al.* (2018) Seroprevalence of Hepatitis B Virus Infection and Associated Factors among Healthcare Workers in Northern Tanzania. *BMC Infectious Diseases*, **18**, Article No. 474. https://doi.org/10.1186/s12879-018-3376-2

[25] Kisangau, E.N., Awour, A., Juma, B., Odhiambo, D., Muasya, T., Kiio, S.N., *et al.* (2018) Prevalence of Hepatitis B Virus Infection and Uptake of Hepatitis B Vaccine among Healthcare Workers, Makueni County, Kenya 2017. *Journal of Public Health*, **41**, 765-771. https://doi.org/10.1093/pubmed/fdy186

[26] Khan, N., Asghar, S., Ahmed, H. and Khan, M. (2021) Knowledge, Attitudes, and Practices about Hepatitis B among Medical and Dental Students of Karachi. *Ibnosina Journal of Medicine and Biomedical Sciences*, **13**, 20-31. https://doi.org/10.4103/ijmbs.ijmbs_140_20

[27] Attaullah, S., Khan, S., Naseemullah,, Ayaz, S., Khan, S.N., Ali, I., *et al.* (2011) Prevalence of HBV and HBV Vaccination Coverage in Health Care Workers of Tertiary Hospitals of Peshawar, Pakistan. *Virology Journal*, **8**, Article No. 275. https://doi.org/10.1186/1743-422x-8-275