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Original Research Article

Undergraduate health science students' knowledge, attitudes, and practices about hepatitis B virus infection prevention at Addis Ababa university, Ethiopia: a cross-sectional study

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ABSTRACT

Background: Hepatitis B (HB) is a serious liver-damaging infection that is caused by the HB virus (HBV). Healthcare professionals are especially susceptible to HB, a serious global public health concern. The aim of this study was to assess the undergraduate health science students' knowledge, attitudes, and practices regarding the prevention of HBV infection.
Methods: A cross-sectional study was conducted among third- and fourth-year health science students at the college of health sciences (CHS), Addis Ababa university (AAU) in Ethiopia. Self-administered structured questionnaire was used to collect the data. Chi square was used to examine the relationship between the outcome variables (mean knowledge, attitude, and practice) and a few socio-demographic factors (age, sex, and year of study). Statistical significance will be determined by p values less than 0.05.
Results: Half of the study participants had adequate knowledge about the HBV. More than half (55%) of research participants were in favor of the HBV vaccination. The Chi square test was used to look at the association between the participants' mean knowledge score and specific socio-demographic characteristics. However, no significant association has been found with any of the selected socio-demographic variables.
Conclusions: While undergraduate health science students generally demonstrate an acceptable level of knowledge and positive attitudes toward HBV infection prevention, there remain significant gaps in practice, particularly regarding vaccination uptake and adherence to standard precautions.

Keywords: HBV, Health science students, Ethiopia

INTRODUCTION

Hepatitis B virus (HBV) is a serious global health concern due to its high infectivity and potential to cause chronic liver disease, including cirrhosis and hepatocellular carcinoma. Worldwide, an estimated 254 million people live with chronic HBV infection, leading to over 1.1 million deaths annually due to complications like liver failure and cancer.[1] The transmission of HBV occurs through contact with infected blood, body fluids, and percutaneous or mucosal exposure to infectious material, which poses a significant occupational hazard for healthcare workers.[2] HB can be prevented by vaccines that are safe, available and effective.[1]

Health science students, particularly those in clinical settings, are at heightened risk for exposure to HBV due to their frequent contact with patients and contaminated instruments. Despite the availability of an effective vaccine, studies indicate that knowledge, attitudes, and practices (KAP) concerning HBV prevention among health science students are often inadequate, raising

concerns about their ability to protect themselves and their future patients.[3,4] According to a survey among medical students, the operating room accounted for 30% of reported needle stick injuries.[5] Prevention is the best approach to combat the high incidence of viral hepatitis. Having the correct knowledge and attitude is essential to halting the spread of this infection.[6] HB can be prevented by taking general precautions including wearing protective barriers like gloves, sterilizing medical equipment, keeping a suitable hospital waste management system in place, and the getting vaccinated.[3,4,7]

However, gaps in knowledge, coupled with low vaccination rates and suboptimal infection control practices, are prevalent even in high-income countries. This underscores the need for improved education and training on HBV prevention strategies, such as vaccination, use of personal protective equipment (PPE), and adherence to standard precautions.[8]

In Ethiopia, HBV remains a significant public health challenge, with an estimated 8.4% prevalence rate among the general population, categorizing the country as having intermediate to high endemicity.[1] The burden of the disease is particularly concerning in the healthcare setting, where limited resources, poor infection control practices, and a lack of vaccination further increase the risk of transmission. Furthermore, the attitudes and practices of health science students regarding HBV prevention are influenced by factors such as inadequate training, lack of access to protective equipment, and limited awareness of standard precautionary measures.[4,9,10] The need for targeted interventions, such as enhanced health education, improved access to vaccines, and strict adherence to infection control protocols, is critical to reducing the burden of HBV among health professionals and students in Ethiopia. The purpose of this study is to assess the undergraduate health science students' knowledge, attitudes, and practices regarding the prevention of HBV infection.

METHODS

Study site and population

The study was conducted at the college of health sciences (CHS), Addis Ababa university (AAU) in Ethiopia. The CHS, one of the country's oldest institutions for medical education, is made up of four schools and a teaching hospital: the school of medicine (SoM), the school of pharmacy (SoP), the school of public health (SPH) and the school of nursing and midwifery (SNM), Tikur Anbessa specialized teaching hospital. Training for health-health sciences students typically lasts four years, with the exception of students pursuing medicine (6 years) and pharmacy (5 years). In this study, the study population consisted of undergraduate students pursuing degrees in anesthesia, midwifery, and nursing.

Study design and period

A cross-sectional study was conducted among third- and fourth-year health science students. The study was conducted in 2023 between 01 May and 30 July.

Sample and sampling method

We used the census method to include all 85 undergraduate students enrolled in third and fourth years of nursing, midwifery, and anesthesia for the current study. These cohorts were chosen on the basis of their clinical exposure and possible HB virus infection risk. The students who chose not to consent for the study or who were unavailable during the study period were excluded.

Study variables and measurement

The study participants' knowledge, attitudes, and practices regarding HBV transmission and prevention were the dependent variables while their sex, age, and departments were regarded as the independent variables. Participants' knowledge of the spread, health consequences, and preventive strategies of HB was assessed using a 17-item questionnaire [Yes=1, no=2, don't know=3]. Knowledge scores for participants were calculated and summed up to give the total knowledge score. The mean score of knowledge was then calculated and values higher than the mean was considered to have adequate knowledge. Similarly, A 7-item Likert scale with three response options ['Agree=1, disagree=2, neutral=3] was used by researchers to determine study participants' attitudes regarding the HB vaccination. The attitude scores of each individual participant were added to determine the overall attitude score. The mean of the attitude score was then ascertained; positive attitudes on the HB vaccination were indicated by a result that was higher than the mean value. To assess the participants' practices about their immunization status and screening habits, two questions were used: ''Have you ever had a screening for HB; yes/no? Have you received a HB vaccination; yes/no?'' ''If yes, how many doses have you received?''

Data collection and analysis

Self-administered structured questionnaire was used to collect information about the socio-demographic characteristics of respondents, KAP towards transmission and prevention of HBV infection. For data analysis, the data was entered into EPi data version 4.0.2.49 and exported into SPSS version 25. Chi square was used to examine the relationship between the outcome variables (mean knowledge, attitude, and practice) and a few socio-demographic factors (age, sex, and year of study). Statistical significance will be determined by p values less than 0.05.

Ethical consideration

The institutional review board (IRB) of the college of health science at Addis Ababa university granted ethical approval. The participants provided written consent, and their identity was kept undisclosed while protecting their privacy.

RESULTS

Participant characteristics

This study included 80 health science college undergraduate students at Addis Ababa university. Sixty-six percent of the participants were female, and anesthesia students made up the majority of participants (47.5%). Eighty percent of the participants were from the third year, while twenty percent of them were from the fourth. The study participants ranged in age from 20 to 25 years old, with a mean age of 21.33 (±1.088) years (Table 1).

Table 1: Socio-demographic characteristics of study participants, college of health sciences September, 2023, (n=80).

Variables	N	Percent (%)
Gender		
Male	27	33.8
Female	53	66.2
Mean age (SD) 21.33 (±1.088)		
Year of study		
Third year	64	80
Fourth year	16	20
Category		
Anesthesia	38	47.5
Nursing	28	35
Midwifery	14	17.5

Assessment of participants' HB knowledge and attitude

Of the respondents, 3/4th of them reported that they had heard of the HBV, whereas 25% said they had never heard of it. The participants' overall mean knowledge score was 8.41 (SD=2.04), with a minimum score of 3 and a maximum score of 12. With a cut-off value of 8.41 for mean knowledge, half of the study participants had adequate knowledge about the HBV. The average attitude score of the participants was 19.53 (SD=1.39), with a minimum of 14 and a maximum of 21. With a mean attitude cut-off score of 19.53, over half (55%) of research participants were in favor of the HBV vaccination (Table 2).

Status of screening and vaccinations

To assess the participants' practices about their immunization status and screening habits, two questions were used: ‘’Have you ever had a screening for HB; Yes/No? Have you received a HB vaccination; Yes/No?’’ While 11.25% of the participants had received a HB vaccination, only 10% of the respondents reported that they had received a HB screening (Figure 1).

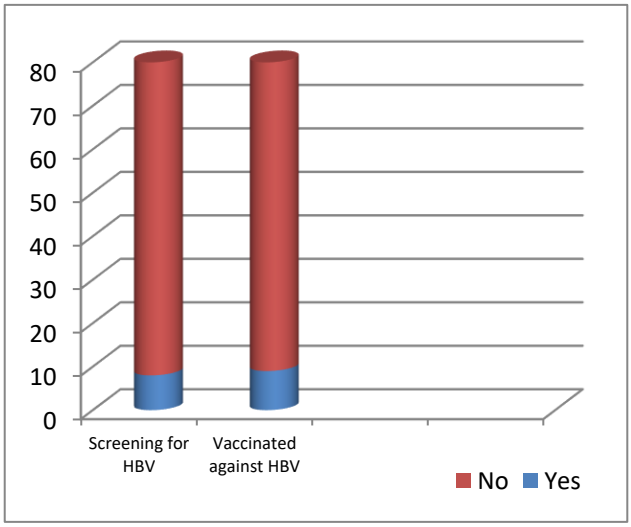

Figure 1: Screening and vaccination status of participants, college of health sciences, Addis Ababa university, Ethiopia, September 2023.

Mean knowledge score of participants with socio-demographic variables

With a cut-off value of 8.41, half of the study participants were deliberated knowledgeable in terms of mode of transmission, health consequences, and preventive strategies of HB. Of the knowledgeable students, 55% were from the anesthesia department, and when compared to their male counterparts, 60% of them were females. Almost 3/4 of third-year students were knowledgeable about HB, according to their year of study. The Chi square test was used to look at the association between the participants' mean knowledge score and specific socio-demographic characteristics. However, no significant association has been found with any of the selected socio-demographic variables (Table 3).

Table 2: The average knowledge and attitude scores of study participants on HB, college of health sciences, Addis Ababa university, September 2023.

Knowledge	Total mean score, n=80	Above the mean score (%)	Below the mean score (%)
	8.41 (SD±2.04)	40 (50)	40 (50)
Attitude	19.53 (SD±1.39)	44 (55)	36 (45)

Table 3: Mean knowledge score of participants with socio-demographic variables on hepatitis B, college of health sciences, Addis Ababa university, September 2023.

Variables		Participants' mean knowledge score		Total (n=80) (%)	P value
		Adequate, (n=40) (%)	Inadequate (n=40), (%)		
Sex	Male	16 (40)	11 (27.5)	27 (33.75)	0.237
	Female	24 (60)	29 (72.5)	53 (66.25)	
Department	Anesthesia	22 (55)	16 (40)	38 (47.5)	0.327
	Nursing	13 (32.5)	15 (37.5)	28 (35)	
	Midwifery	5 (12.5)	9 (22.5)	14 (17.5)	
Year of study	Third year	29 (72.5)	35 (87.5)	64 (80)	0.09
	Fourth year	11 (27.5)	5 (12.5)	16 (20)	

DISCUSSION

HBV infection is a global public health concern, particularly for healthcare professionals, who are at increased risk of exposure. This discussion focuses on the knowledge, attitudes, and practices of undergraduate health science students regarding HBV prevention, as they are future healthcare providers and their understanding of this disease is crucial for effective prevention and control. The most infectious blood-borne pathogen is HBV. One of the biggest concerns with HBV exposure in the workplace for healthcare professionals is the risk to health trainees.[11] Undergraduate health science students' knowledge of HBV is crucial since it can influence their professional conduct and preventive measures. A study conducted by Noubiap et al reported that while many students had a general understanding of HBV, misconceptions about its transmission were still common.[11] For instance, some students mistakenly believed that casual contact, such as handshakes, could spread HBV. Such misconceptions highlight the need for more comprehensive education and training on HBV transmission, prevention, and treatment options during their undergraduate programs. About 50% of the students in the current survey knew about the preventive measures, modes of transmission, and health impacts of HB. Our findings are in not line with an Indian research that revealed 64% of dental students were aware of the different ways HB may spread, 53.3% were aware of the adult immunization schedule, and 96.6% were aware of the HB vaccine.[12] However, our results are better than a Pakistani study of medical students in Karachi, where 39% of respondents said they were aware of HB.[13]

Students' attitudes toward HBV prevention play a significant role in their likelihood to engage in protective behaviors. Positive attitudes, such as a strong belief in the efficacy of vaccination and personal responsibility for infection prevention, are associated with higher rates of adherence to protective measures. In the current study, more than half (55%) of research participants were in favor of the HBV vaccination. A study has found that students who view HBV infection as a severe health threat are more likely to adopt preventive measures, such as completing the full vaccination course.[14] On the other hand, students who underestimate the risk of HBV or its potential consequences are less likely to prioritize vaccination or engage in safe practices. Attitudes toward risk perception can, therefore, significantly impact whether students adopt recommended preventive strategies.

Despite awareness and generally positive attitudes, the actual preventive practices among undergraduate health science students are not always consistent. Studies indicate that while a large proportion of students are aware of the importance of the HBV vaccine, vaccination coverage remains suboptimal. For example, Kesieme et al reported that although over 90% of students knew that HBV could be prevented by vaccination, only about 60% had received the complete three-dose series.[14] While 11.25% of research participants had received a HB vaccination, more than half (55%) of them in the current study supported vaccination against the HBV. These results are lower than that of a study conducted among preclinical medical students in Nepal, where the vaccination rate was 37%.[15] Our finding is also less than the Saudi Arabian study in which 38% of participants received all three doses, but significantly more than the 2% of Ethiopian participants who completed all three doses.[4,16] Our finding implies that determining students' vaccination status before they enter the clinical years is important to ensure high vaccination rates during their clinical training. Although the HBV vaccine was added to Ethiopia's immunization program in 2007, it remains inaccessible, which may contribute to the low acceptance rate of the vaccine among study participants.[4] Barriers to vaccination identified in the literature include lack of access, cost, and fear of side effects.[11] Some studies suggest that health science students, particularly in their clinical years, may not always follow recommended safety practices, increasing their risk of occupational exposure to HBV.[11,17,18] Training and practical education play a pivotal role in improving these practices. Incorporating rigorous infection control training into the curriculum can significantly enhance students' adherence to preventive measures. Furthermore, promoting the availability of free or subsidized HBV vaccinations could improve vaccination rates among this group.[18]

Participants' socio-demographic information did not correlate with their mean knowledge score, which is

consistent with research from Malaysia that found no correlation between gender and knowledge.[10] However, research from Nepal and Pakistan respectively, found that women had higher overall KAP scores than men.[13,15] Besides, in contrast to our findings, the Ethiopian study revealed a significant correlation between the respondents' mean knowledge and practice scores and their sex and study department.[7]

Limitations

Self-reported data may lead to biases such as social desirability, where participants provide answers, they believe are expected rather than what they truly practice or know. This can affect the accuracy of the findings. The study is a cross-sectional that only provides a snapshot of knowledge, attitudes, and practices at a specific point in time, limiting the ability to assess changes over time or determine causality. The study may be limited to a specific institution [Addis Ababa university] and a group of students [Health science students], which could affect the generalizability of the findings to other populations or settings. There may also be a gap between what students know and what they actually practice in clinical settings. The study might not fully capture the practical application of their knowledge in real-life situations. The sample size is also small and not adequately representative of the broader population of health science students; this could limit the statistical power and robustness of the findings. Finally, the participants' anti-HB surface antibody (HBsAb) titer was not measured, making it impossible to confirm their immunization status.

Strengths

The study focuses on undergraduate health science students, who are at higher risk of HBV exposure due to their involvement in clinical practice and patient care. This makes the findings relevant for improving prevention strategies in the healthcare field. HB infection is a significant global health issue. The study addresses a key area of concern, contributing to the understanding of how to prevent its spread among future healthcare professionals. The study's insights into students' knowledge, attitudes, and practices could inform educational curricula, identifying gaps that need to be addressed for better HBV prevention training. By highlighting gaps in knowledge and practice, the study can influence health policy, particularly in the implementation of vaccination programs, safety protocols, and awareness campaigns among healthcare workers.

CONCLUSION

In summary, while undergraduate health science students generally demonstrate an acceptable level of knowledge and positive attitudes toward HBV infection prevention, there remain significant gaps in practice, particularly regarding vaccination uptake and adherence to standard precautions. Targeted educational interventions are needed to address misconceptions, enhance risk perception, and promote comprehensive vaccination. Additionally, improving access to vaccines and strengthening infection prevention protocols within healthcare training settings could ensure that future healthcare professionals are better equipped to prevent HBV transmission.

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