Status of Hepatitis-B Vaccination among Clinical Undergraduate Students of the University of Ibadan, Nigeria

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Abstract. *Background:* The Hepatitis B virus (HBV) has been a major threat to public health, especially in developing countries, with its increased morbidity and mortality rate. It is possible for transmission of HBV among clinical students to go unnoticed over a long period of time; thus, the necessity to enquire from the students their knowledge on HBV, their vaccination status, their common safety practices while on clinical posting, and their attitudes towards prevention of HBV spread.

Methods: A descriptive cross-sectional design was adopted. A structured, self-administered questionnaire was used to gather data from 286 undergraduate clinical students in University of Ibadan, Nigeria. Purposive sampling technique was adopted in selecting students who participated in the study. Data was analyzed using SPSS version 22.0. Inferential statistics of chi-square test at 0.05% level of significance was used for hypotheses testing.

Results: The result revealed that respondents had good knowledge about hepatitis B virus. 67.9% of the respondents have received hepatitis B vaccine, but only 37.6% of the students have received the complete (3 doses) of the hepatitis B vaccination. There is a significant association between students' level of study and HBV vaccine uptake (p value = 0.013)

Conclusion: Health professionals should be actively involved in continuous education of clinical students on hepatitis B virus with a greater emphasis on the need for vaccination. Also, mandatory hospital and university policies should be made to compel clinical students for vaccination before any clinical exposure.

Keywords: Hepatitis B, vaccination, clinical students, Nigeria

Introduction

Hepatitis B virus has been a major public health concern, especially in developing parts of the world, with its increased morbidity and mortality rate (Khan et al., 2010). Research has revealed that there are over 2 billion people who have been infected with HBV, and there are more than 350 million carriers of the virus (Al-Hazmi, 2015). The HBV is known to diffuse through percutaneous or mucosal coverage to flowing blood path or other body fluids. It is also noted to belong to the family of Hepad-naviridae with moderately double-stranded circular DNA (Farjana, & Mominur, 2019). Noteworthy is that Hepatitis B can be acute or chronic: The acute hepatitis B is known to be frequently unrecognized in kinds younger than 5-years-old, and it presents itself through a number of initial symptoms, such as – anorexia, chilis, headache, nausea, vomiting, and sometimes jaundice (Farjana, & Mominur, 2019). Chronic forms of hepatitis B, after about 10 years leads to Cirrhosis and development of hepatocellular carcinoma (HCC); which increases their chances of dying premature through any of the HBV-related complications (Farjana, & Mominur, 2019).

HBV is potentially prevalent among medical students as a result of their activities involving contact with patients or blood or other fluids, in the process of healthcare, laboratories or public-safety surroundings (Al-Hazmi, 2015). Asides the students, on a general

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note, HBV has been identified to be pose threat of occupational hazard to any class of healthcare workers; the medical students have been focused on as having the highest risk of spreading the HBV due to their clinical inexperience (Adeleye et al., 2019).

In spite of the fatality of the HBV, a handful preventive and control measures have been identified to mitigate its spread generally among health workers and clinically students. Evidence has revealed that there is lifesaving vaccine made available to curb the HBV occurrences, but regardless spread of the disease caused by HBV increases per year; it was added that deficiency in proper knowledge about the disease and its vaccination is the major constraint in mitigating the spread of HBV (Farjana, & Mominur, 2019). Previous researches have further emphasized that preventing HBV is the only risk-free manner to culminate the high prevalence of the viral hepatitis.

Transmission of HBV among medical students, if care is not taken, will be rampant and go unnoticed over a long period of time; thus, the necessity to enquire from the students their knowledge on HBV, their vaccination status, their common safety practices while on clinical posting, and their attitudes towards prevention of HBV spread.

Having sufficient knowledge may not necessarily translate to positive attitudes, vaccine dose compliance, and adherence to safety practices. Consequently, it becomes a problem to find out that despite clinical student's knowledge on the severity and effective transmission of HBV, only a few of them had been screened for HBV or complied to the vaccination dose or maintain safe practices while on clinical postings. Therefore, this study is designed to expose findings that suffice for evidence-based planning and policy-making to aid hospitals on steps to be taken, to better the clinical students' position in militating against the effective spread of HBV.

Methods

Study Design

This study employed a descriptive cross-sectional design, conducted among undergraduate clinical students at the University of Ibadan, Ibadan, Oyo state.

Study Setting

The College of Medicine, University of Ibadan, was chosen as the location for this study, with clinical students who reside either at the main campus or the University College Hospital Campus. Neighboring areas to the university of Ibadan community include: Agbowo, Ajibode, Apete, Orogun, and Samonda. The University College Hospital (UCH) is located at a distance away from the main campus. The University College of Hospital Ibadan was established by an august 1952 act of parliament in response to the need for the training of medical personnel and other healthcare professionals for Nigeria and the West African sub-region. In addition to undergraduate medical program, UCH also provides postgraduate studies. Some of the medical students in their clinical phase reside within UCH environ. Only medical students from nursing departments reside at the main campus, even at their clinical phase. Other medical students from Physiotherapy, Dentistry, MBBS, and Medical Laboratory Science reside at the University College Hospital (UCH).

Sample Size Determination

The sample size was determined using the one-sample proportion for precision, adopted by Leslie Kish (1965) formula for descriptive cross-sectional study.

The formula is given by:

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

Where;

$Z_{0.05}$ = Standardized normal value for 5% level of significance = 1.96

$p = 0.23$; proportion of medical students in their clinical years who had received HBV vaccine at a Olabisi Onabanjo University Teaching Hospital, Ogun State (Adeleye et al., 2019)

$d =$ Projected degree of precision = 5%

$$n = \frac{(1.96^2) \times 0.23 \times 0.77}{0.05^2} \approx 272$$

Adjustment for non-response rate is given as follows:

$$n = \frac{272}{1 - 0.05} \approx 286$$

The new estimated sample size for medical students in their clinical phase is 286.

Sampling Technique

Clinical students from the following programs were be sampled for the study: Nursing, Physiotherapy, MBBS, Dentistry and Medical Laboratory Science. Purposive sampling technique was adopted in selecting students who participated in the study. Structured self-administered questionnaires were distributed to students at their various departments.

Data Collection and Analysis

The research instrument was distributed among students from the aforementioned departments. A self-administered and structured questionnaire was designed and retrieval of questionnaires was done at point of sharing the questionnaires among the students.

Data were sorted and preliminary codes were assigned to the responses obtained. Data was analyzed using SPSS version 22.0. The chi-square test of independence was used to investigate association between the level of study and knowledge about HBV is not statistically significant at $p<0.05$.

Ethical Approval

The proposal for the study was sent to the ethical review board of university of Ibadan and university college hospital for proper review. The approval was given with registration number of NHREC/05/01/2008a. Confidentiality of participants was ensured throughout the study and the process of data collection was of no harm to the participants. Explanation on the purpose and importance of the study was given to the participants and anonymity was ensured during data collection, analysis and presentation.

Results

Socio-Demographic Information

The socio-demographic information of the participants revealed information on age, gender, marital status, level of study, department, religion, mother's level of education, and father's level of education, family history of HBV and health professionals in family. It further shows the socio-demographic characteristics of 286 sample respondents (Table 1). The distribution of the gender showed that 152(53.1%) of the respondents are males and 134(46.9%) are females. The mean age in the study was 21.8±2.7 years. The marital status of the respondents showed that 279(97.6%) are single. The level of study showed that 400level clinical students have the highest frequency of 164(57.3%). Respondents in medicine and surgery have highest frequency of participation 93(32.5%).

Table 1. Socio-demographic information of study respondents

	Frequency (n = 286)	Percentage
Age [21.8 ± 2.7]		
≤ 20 years	95	33.2
21 – 24 years	159	55.6
≥ 25 years	32	11.2
Gender		
Male	152	53.1
Female	134	46.9
Marital Status		
Single	279	97.6
Married	7	2.4
Level of Study		
300 Level	71	24.8
400 Level	164	57.3
500 Level	48	16.8
600 Level	3	1.0
Department		
Nursing	37	12.9
Physiotherapy	78	27.3
MB;BS	93	32.5
Dentistry	25	8.7
Medical Laboratory Science	53	18.5
Religion		
Christianity	244	85.3
Islam	40	14.0
Others	2	0.7
Mothers' Level of Education		
Non-formal	7	2.4
Primary	20	7.0
Secondary	52	18.2
Tertiary	207	72.4
Fathers' Level of Education		
Non-formal	12	4.2
Primary	14	4.9
Secondary	47	16.4
Tertiary	213	74.5
Family History of HBV		
Yes	6	2.1
No	280	97.9
Health Professional in Family		
Yes	127	44.4
No	159	55.6

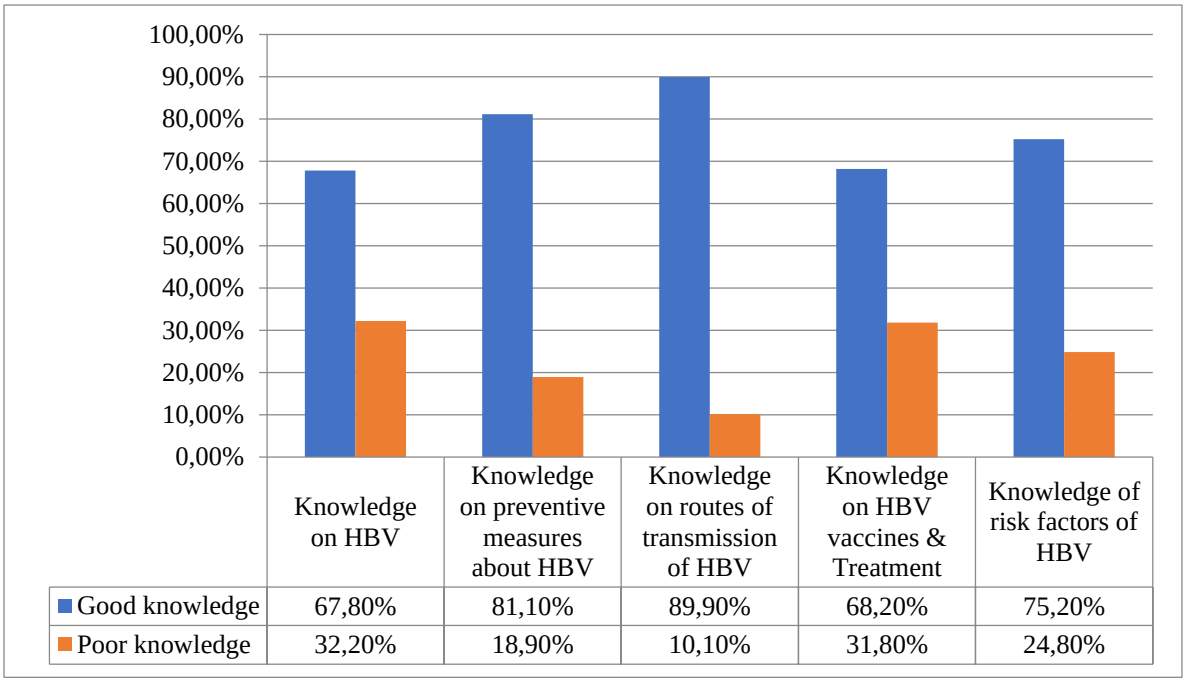
Awareness about Hepatitis-B Virus

The result indicated that majority (99.3%) of them were aware of hepatitis B virus. Also, majority 203(71.5%) of the respondents' source of awareness was through lecture.

Knowledge on HBV Vaccines and Treatment

The majority (68.2%) of the respondents have a good knowledge on HBV vaccines and treatment.

The figures below illustrate the level of knowledge of the respondents on HBV.



	Knowledge on HBV	Knowledge on preventive measures about HBV	Knowledge on routes of transmission of HBV	Knowledge on HBV vaccines & Treatment	Knowledge of risk factors of HBV
Good knowledge	67,80%	81,10%	89,90%	68,20%	75,20%
Poor knowledge	32,20%	18,90%	10,10%	31,80%	24,80%

Figure 1. Knowledge of hepatitis B virus among clinical undergraduate student, University of Ibadan

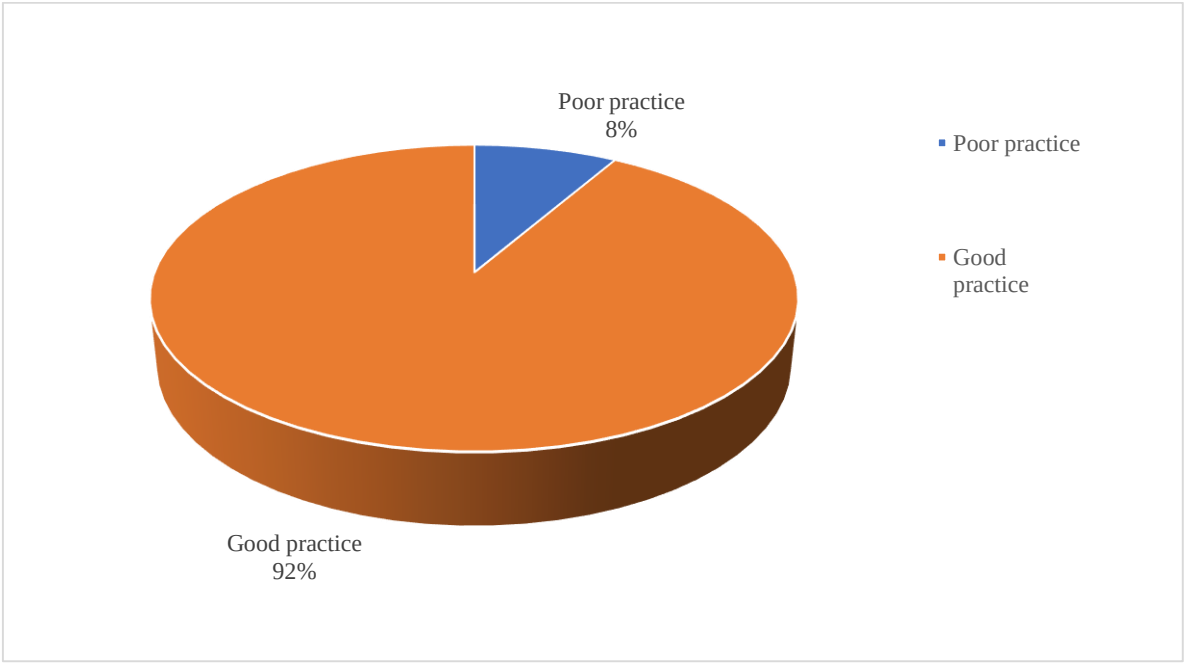


Figure 2. Practice toward the preventive measure of hepatitis b virus

HBV Screening and Vaccination Uptake

The rate of HBV screening and vaccination uptake among the respondents is shown in Table 2. It was found out that, 65.7% of the respondents have been screened, and 67.9% of the respondents have received hepatitis B vaccine, but only 37.6% of the students have received the complete (3 doses) of the hepatitis B vaccination.

Table 2. HBV screening and vaccination uptake among students

	Frequency (n = 286)	**Percentage**
HBV Screening		
Screened	188	65.7
Not screened	89	3.1
Non-response	9	3.1
Hepatitis B Vaccination		
Received vaccine	194	67.9
Not received vaccine	83	29.0
Non-response	9	3.1
Number of Doses Received (n = 194)		
1 dose	43	22.2
2 doses	75	38.7
3 doses	73	37.6
Non-response	3	1.5
Received an Unscreened Blood Transfusion		
Yes	6	2.1
No	273	95.5
Non-response	7	2.4
Had Needle Pricks		
Yes	174	60.8
No	100	35.0
Non-response	12	4.2

Perception towards Hepatitis B Virus

The respondents have a positive perception towards hepatitis B virus.

Practices towards the Prevention of Hepatitis B Virus

Analysis showed that the preventive practice among the respondents is good as majority (92%) engage in good practice towards the prevention of hepatitis B virus.

Hypothesis 1:

Ho: There is no significant association between students' department and their level of knowledge on HBV.

Association between Students' Discipline and Level of Knowledge

It was found from this study that there is no significant relationship between the discipline of the clinical students and their level of knowledge of HBV because the p value which is, 0.155 is greater than 0.05. This implies that the statement of the null hypothesis will be not be rejected. Therefore, it can be stated that there is no relationship between the discipline of the clinical students and their level of knowledge of HBV and this mean the variation in the discipline of the clinical students do not affect their level of knowledge on HBV.

Hypothesis 2:

Ho: There is no significant association between students' level of study and HBV vaccine uptake.

The p value of this hypothesis is 0.013 based on the result of this study which is less than 0.05. This result however suggests that there is a significant association between students' level of study and HBV vaccine uptake.

Discussion

This study examined Hepatitis b vaccination knowledge and status of clinical undergraduate students in the University of Ibadan, Ibadan, Oyo state. All the 286 questionnaires distributed were completed and returned, giving a response rate of 100%. The male gender (152) participated more than the female participants (134). The age range of the participant is between <20 years - ≥25 years; where more participants are between 21 and 24 years (159). Students in discipline of medicine (MB; BS) (93) participated more than the clinical students from other discipline. However, in all the levels of study, regardless of the departments, clinical students in 400-level participated more with a number of 164 out of 286 clinical students in this study.

Also, 263 out of 286 students know about the existence of HBV vaccine and its effective protection against HBV. This is in a relation with a study conducted in 2019 among first year medical students (Giri, Panda, & Sahoo, 2016). Of these students, 32.7% knew the type of vaccine used for HBV. The study however, showed a poor knowledge of medical students which may be associated with the level of their study.

In this study, 188 students are screened for hepatitis B, 89 students are not screened while 9 students are not sure about the screening. It is also found in this study that, 194 students received vaccine while 83 students did not receive vaccine, while 9 did not respond at all. More so, 43 students received 1 dose, 73 students received 2 doses, 73 students receive 3 doses while there 3 responses. A previous study reported in a study that 22.8% are adequately vaccinated, 19.8% had an incomplete vaccination while 57.4% respondents are unvaccinated (Adeleye et al., 2019). In 2019, it was reported that out of 714 participants, only 186 were vaccinated and of these, only 120 had received all the 3 doses (Aroke et al., 2018).

This study further revealed that 87% of the clinical students have a positive perception while 13% have a negative perception towards Hepatitis B virus. Most medical students had a positive attitude toward HBV vaccine. Most clinical students see a need to be vaccinated against hepatitis B virus (Aroke et al., 2018).

In this study, 92% of respondents have good practice toward prevention of hepatitis B virus. This is in agreement with a previous study that revealed the practice of preventive measures include taking every patient as a contagious disease risk, washing hands after contact with patient's body fluid and wearing of gloves were the most practiced universal standard precaution items (Adenlewo, Adeosun, & Fatusi, 2017). Most clinical students know, understand and practice the standard precautions against hepatitis B virus during clinical exposures.

The study however revealed that there is no significant relationship between the department of the clinical students and their level of knowledge of HBV because the p value which is, 0.155 is greater than 0.05 and this implies that the statement of the null hypothesis will be accepted. Therefore, it can be stated that there is no relationship between the department of the clinical students and their level of knowledge of HBV and this mean the variation in the department of the clinical students do not affect their level of knowledge on HBV. The difference in clinical department does not have influence in their level of knowledge about HBV.

The p value of the second hypothesis is 0.013 based on the result of this study which is less than 0.05. This result however suggests that there is a significant association between students' level of study and HBV vaccine uptake. The null hypothesis is thereby rejected. This implies that the level of study of clinical students affect their rate of uptake of HBV vaccine.

This is similar to study reported by Adeleye et al. (2019), where it was found out that year 1V(400L) medical students were less vaccinated than year V (500L) students. Therefore, there is a relationship between the clinical students' level of study and their uptake of HBV vaccine.

In this study, it was found out that clinical students of the various departments use (physiotherapy, medicine, dentistry, nursing and medical laboratory science) have a better knowledge of Hepatitis B but those in 400 level have a higher rate compared to those in other levels. The reasons behind this awareness and knowledge can be attributed to the fact that their lectures have been effective because 203 (71.5%) respondents regarded lectures as being the source of their awareness while the rate of awareness from the health worker is 57%. There is therefore a need for the health care workers especial nurses to intensify their efforts in creating awareness to the clinical students on the ward also and not just in the classrooms.

Also, it was found out that out of 194 students that received the vaccine, only 73 students received all the three doses which amount to a low percentage of 37.6%. Clinical students should however be encouraged and educated by the nurses and other health care workers to have the mind of completing all doses. 82.9% of the clinical students strongly agreed that training programs about occupational risk of HBV should be offered to medical students. This high response shows that the students strongly crave for programs like that. This however, poses a challenge to the clinical instructors, nurses and other health care workers.

Moreover, it is shocking to find out that not less than 174 students have had needle pricks but it is consoling to find out that, of these, 159 clinical students had once reported the needle prick injury. The question now is, whether they report needle pricks injury or not, how sure is their status after the needle pricks? Could they be sure they are not infected with HBV or any other infections? All these can actually be dodged if there is a mandatory policy for the clinical students to be vaccinated against HBV before clinical exposures.

Funding
Not applicable.

Conflicts of Interest
None declared.

Key-points

- This study showed that a higher percentage of clinical students are aware of hepatitis b virus and have good knowledge of its vaccine.
- It also revealed that students in the lower level are less vaccinated than students at the higher level students due to their lesser clinical exposures.
- It was discovered that although clinical students have a positive attitude toward HBV vaccine, a lower percentage however had a complete vaccination and this implies that their knowledge need to be broadened concerning the importance of complete vaccination (3 doses of HBV vaccine) and not just a mere vaccination for the claim of it.
- Mandatory hospital and university policies should be made to compel clinical students for vaccination before any clinical exposure.

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