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Original Article **Open Access**

Knowledge and awareness of hepatitis B amongst students of Pamo University of Medical Sciences (PUMS), Port Harcourt, Rivers State, Nigeria

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Abstract:

Background: Globally, 296 million people were infected by hepatitis B in 2019, with 1.1 million deaths. Africa is one of the endemic regions. Good knowledge and awareness of hepatitis B remain pivotal to the biosafety of medical students. This study sought to determine the levels of knowledge and awareness of hepatitis B among students of Pamo University of Medical Sciences (PUMS), Port Harcourt, Nigeria, and the predicting factors associated with this knowledge and awareness. The is with the aim of providing recommendations for improving and sustaining biosafety levels for medical and other health-related students of the University.
Methodology: The study was a descriptive cross-sectional design conducted amongst 528 randomly selected medical students of PUMS, Port Harcourt, Nigeria. Structured questionnaires were interviewer-administered to collect socio-demographic information and participants' responses to questions on knowledge and awareness of hepatitis B. Data were analysed using SPSS version 26.0 and relationships of socio-demographic characteristics and predictive factors with knowledge and awareness of hepatitis B were tested using binary logistic regression analysis with *p* value for statistical significance set at <0.05.
Results: A total of 528 students participated in the study, 202 (38.3%) males and 326 (61.7%) females. Most participants (296, 56.1%) were between 15-19 years of age with mean age of 19 ±2.43 years. The mean (±SD) of participants responses with good knowledge of hepatitis B was 249±121.5 while for good awareness, it was 181±88.3. The percentage average for good knowledge and good awareness was 47.2% and 34.2% respectively, with positive correlation between knowledge and awareness of hepatitis B (r=0.720, $p<0.0001$). Age was significantly associated with participants percentage average knowledge (OR=0.77, 95% CI 0.70-0.84, $p<0.0001$) and awareness of hepatitis B (OR=0.84, 95%CI 0.78-0.90, $p=0.004$). No other factor was significantly associated with knowledge and awareness of hepatitis B except Ijaw tribe (OR=0.4, 95%CI 0.24-0.66, $p=0.034$) and attendance of Federal Government College (OR=0.4, 95% CI 0.24-0.68, $p=0.046$).
Conclusion: The percentage average good knowledge of 47.2% and awareness of 34.2% for hepatitis B in this study are low, although most participants in the study were between the ages of 15-19 years and in their first and second year of study. This gives room for improvement in knowledge and awareness of hepatitis B with progression in age and year of training. Good knowledge and awareness of hepatitis B are central to the biosafety of medical students. It is recommended that the National Universities Commission (NUC) and the Medical and Dental Council of Nigeria (MDCN) review the current medical school curriculum to increase the teaching of medical and health-related students that will impact more on knowledge and awareness of infectious diseases and infection prevention and control.

Keywords: Knowledge, awareness, hepatitis B, Pamo University, Nigeria.

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Connaissance et sensibilisation à l'hépatite B parmi les étudiants de l'Université des sciences médicales de Pamo (PUMS), Port Harcourt, État de Rivers, Nigéria

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Résumé:

Contexte: Dans le monde, 296 millions de personnes ont été infectées par l'hépatite B en 2019, avec 1,1 million de décès. L'Afrique fait partie des régions endémiques. Une bonne connaissance et sensibilisation à l'hépatite B reste essentielle à la biosécurité des étudiants en médecine. Cette étude visait à déterminer les niveaux de connaissance et de sensibilisation à l'hépatite B parmi les étudiants de l'Université des sciences médicales de Pamo (PUMS), à Port Harcourt, au Nigeria, ainsi que les facteurs prédictifs associés à ces connaissances et sensibilisation. L'objectif est de fournir des recommandations pour améliorer et maintenir les niveaux de biosécurité pour les étudiants en médecine et dans d'autres domaines liés à la santé de l'Université.
Méthodologie: L'étude était une conception transversale descriptive menée auprès de 528 étudiants en médecine sélectionnés au hasard au PUMS. Port Harcourt, Nigéria. Des questionnaires structurés ont été administrés par l'intervieweur pour recueillir des informations sociodémographiques et les réponses des participants aux questions sur la connaissance et la sensibilisation à l'hépatite B. Les données ont été analysées à l'aide de SPSS version 26.0 et les relations entre les caractéristiques sociodémographiques et les facteurs prédictifs avec la connaissance et la sensibilisation à l'hépatite B. ont été testés à l'aide d'une analyse de régression logistique binaire avec une valeur de *p* pour la signification statistique fixée à <0,05.
Résultats: Au total, 528 étudiants ont participé à l'étude, 202 (38,3%) hommes et 326 (61,7%) femmes. La plupart des participants (296, 56,1%) étaient âgés de 15 à 19 ans, avec un âge moyen de 19±2,43 ans. La moyenne (± ET) des réponses des participants ayant une bonne connaissance de l'hépatite B était de 249±121,5 tandis que pour une bonne connaissance, elle était de 181±88,3. Le pourcentage moyen de bonne connaissance et de bonne sensibilisation était respectivement de 47,2% et 34,2%, avec une corrélation positive entre la connaissance et la sensibilisation à l'hépatite B (r=0,720; p<0,0001). L'âge était significativement associé au pourcentage de connaissances moyennes des participants (OR=0,77; IC à 95% 0,70-0,84; p<0,0001) et à la connaissance de l'hépatite B (OR=0,84; IC à 95% 0,78-0,90; p=0,004). Aucun autre facteur n'était associé de manière significative à la connaissance et à la sensibilisation à l'hépatite B, à l'exception de la tribu Ijaw (OR=0,4; IC à 95% 0,24-0,66; p=0,034) et de la fréquentation du Collège du Gouvernement Fédéral (OR=0,4; IC à 95% 0,24-0,68; p=0,046).
Conclusion: Le pourcentage moyen de bonnes connaissances de 47,2% et de sensibilisation de 34,2 % à l'hépatite B dans cette étude est faible, bien que la plupart des participants à l'étude étaient âgés de 15 à 19 ans et en première et deuxième années d'études. Cela laisse place à une amélioration des connaissances et de la sensibilisation à l'hépatite B avec une progression en âge et en année de formation. Une bonne connaissance et sensibilisation à l'hépatite B est essentielle à la biosécurité des étudiants en médecine. Il est recommandé que la Commission Nationale des Universités (NUC) et le Conseil Médical et Dentaire du Nigéria (MDCN) réexaminent le programme actuel des facultés de médecine afin d'accroître l'enseignement aux étudiants en médecine et dans les domaines de la santé, ce qui aura davantage d'impact sur la connaissance et la sensibilisation aux maladies infectieuses. et la prévention et le contrôle des infections.

Mots-clés: Connaissance, sensibilisation, hépatite B, Université de Pamo, Nigéria

Introduction:

Hepatitis B, an inflammatory disease of the liver, is a leading cause of liver cancer and cirrhosis, affecting 296 million people globally (1), and accounting for 1.1 million global deaths in 2019 (2). An estimated 3.6% of the global population is affected by chronic hepatitis B (3,4). There is disproportionate distribution of hepatitis B amongst regions of the world. The prevalence is highest in the Western Pacific, accounting for 116 million infections, followed by the African region, accounting for 81 million, and the Eastern Mediterranean region and Southeast Asia, each accounting for 60 million and 18million infections respectively. Europe and the Americas account for 14 and 5 million respectively (5).

In 2016, the World Health Assembly endorsed the goal of eliminating viral hepatitis as a public health threat by 2030, including the elimination of mother-to-child transmission (EMTCT) of hepatitis B virus (HBV), documented by demonstration of ≥90% coverage and three doses of HepB (HepB3) vaccine, and ≤0.1% hepatitis B surface antigen (HBsAg) seroprevalence among children ≤5 years of age (6).

Hepatitis B is transmitted via inoculation with contaminated sharps or hospital devices, transfusion with unscreened blood, mother-to-child vertical transmission or through breast feeding, sexual route amongst others. Vulnerable groups include health workers, medical and nursing students, sexually active individuals, people who engage in same sex intercourse, intravenous drug abusers, renal dialysis patients, sickle cell patients, inmates and staff of correctional centres (7).

Nigeria is rated as one of the countries hyper-endemic for hepatitis B infections with prevalence greater than 8% (8). About 1 in 10 Nigerians living with hepatitis B are not aware of their status and therefore not captured in global public health statistics due to interplay of unawareness, resource constrains and lack of political will to address headlong this national plight (9-11). A study done in 2021 (12) reported hepatitis B prevalence rate of 5.1% in Port Harcourt city with male to female distribution of 7.9% and 3.4% respectively, with two peak age groups; 24-29 years and

30-34 years of 8.29% and 9.2% respectively. Nigeria ranks as one of the countries with the highest percentage prevalence of hepatitis B related malignancies in West Africa with an age-standardised incidence estimate of 2.6 to < 5.1 cases per 100,000 person-years (13, 14).

Hepatocellular carcinoma (HCC) is one of such malignant neoplasm associated with hepatitis B. HCC has limited treatment options which are yet to be popular in resource poor settings and in Nigeria where cost of treatment is out-of-pocket, these treatment options, even where available, are not affordable to the vulnerable population (8). Furthermore, there is lack of advance diagnostic facilities such as immunoassays, nucleic acid amplification tests and the absence of focused public enlightenment programs with emphasis on enhancing knowledge and awareness of debilitating diseases such as HCC. These missing gabs constitute impedance on the path to achieving prevention, control or possible elimination of hepatitis infections in Nigeria as declared by WHO.

It is on this premise that this study sought to evaluate the knowledge and awareness of hepatitis B amongst the students of Pamo University of Medical Sciences (PUMS), Port Harcourt, Nigeria, a newly established medical university, yet having 500-level stream of Medicine and Surgery students as the topmost undergraduate class in the Faculty of Clinical Sciences of the University. The objectives of this study are to determine the knowledge and awareness levels of hepatitis B amongst students of the University and the predicting factors influencing this knowledge and awareness. The outcome of this study is intended to provide empirical evidence of the need or otherwise for early inclusion of infectious diseases prevention and control programs in the curricular of training for medical schools in Nigeria.

Materials and method:

Study design, setting and period:

This study was a descriptive cross-sectional design conducted amongst the students of Pamo University of Medical Sciences, Port Harcourt, Rivers State, Nigeria, from February 17 to March 25, 2022. Pamo University of Medical Sciences was established in 2017 as the first private medical university in Nigeria with an initial student population of 123. The current student population is under 1000, all residential within the campus.

The university has a serene environ ment for learning and steady power and water supply. The university has a sick bay to take care of the health of staff and students. Those with serious health challenges are referred to multi-specialties Pamo hospital, located along Aba Road, Port Harcourt. Presently, the univer sity has 4 faculties and 2 academic units. The faculties are the Faculty of Clinical Sciences, Faculty of Basic Clinical Sciences, Faculty of Basic Medical Sciences and Faculty of Allied Health Sciences, while the academic units are Basic Science, and General & Entrepreneurial units. There are total of 29 academics departments in the University.

Ethical approval:

Approval for the study was given by the office of the Vice Chancellor, after a thorough review of ethical issues involved in the study.

Determination of sample size:

The sample size was determined using the Fisher formula (15); $N=Z^2pq/d^2$, where N=sample size, Z=1.96 (i. e. 95% confidence interval), d=0.05 (margin of error), p=0.051, which is the prevalence of hepatitis B in Port-Harcourt from a previous study (12), and q=1-p (0.949). This gave a calculated minimum sample size of 206, which was increased to 528, allowing the recruitment of all the participants who gave informed consent.

Inclusion/Exclusion criteria:

To be included in the study, one was mandatorily a student of Pamo University of Medical Sciences, irrespective of the discipline. Staff of the University were excluded.

Data collection:

Structured questionnaires were used to collect socio-demographic information from the 528 participants and their responses to probing questions to establish their levels of knowledge and awareness of hepatitis B. The questionnaire contains 3 sections, with the first section for collecting sociodemographic information of the participants. The second and third sections, each with 15 questions, respectively assessed knowledge and awareness of hepatitis B amongst the participants.

The questionnaires were interviewer-administered. The consent form was first explained to each participant before data collection with assurance of the safety of the exercise, secrecy of data submitted, freedom to opt out of the study without any consequence, assurance of no cost on their part and that the interview would take about 10 minutes. Each participant gave signed informed consent before administration of questionnaire.

To ensure that only eligible students of a particular class were enlisted, two laboratory scientists and an administrative staff were used to administer the questionnaires to all eligible students while seated to commence a semester examination and given 10 minutes to complete and turn them in before commencement of the examination. In the questionnaire, correct responses under 'yes' were indications for "good knowledge or awareness",

wrong responses under 'no' were indications for "poor knowledge or awareness'' and "I don't know" responses were indications for "no knowledge or awareness" of hepatitis B.

The frequency of participants responses under each category of responses were summed up, divided by 15, and multiplied by 100 to derive the percentage average responses of participants with "good knowledge or awareness", "poor knowledge or awareness" and "no knowledge or awareness" of hepatitis B respectively (16). The mean and standard deviation (SD) of participants' responses for each category were also calculated. The percentage response values in the three categories of knowledge or awareness of hepatitis B were deemed high or low depending on whether the value was above or below 50%.

Statistical analysis of data:

Data were analysed with the Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous and categorical variables were summarised and reported as mean ±SD and percentage values respectively. The percentage knowledge and awareness scores were dichotomised into poor and good knowledge/awareness.

Binary logistic regression model was used to test for association between outcome variables (e. g. poor knowledge score vs good knowledge score) and the independent variables (predictors), with calculation of their odd ratios (ORs) and 95% confidence intervals (CIs). Statistical significance was set at *p* less than 0.05

Results:

Socio-demographic data of the participants:

A total of 528 students of Pamo University of Medical Sciences, Port Harcourt, Nigeria, participated in this study by completing and turning in their questionnaires. Table 1 shows the distribution of the socio-demographic characteristics of the participants. Majority of the study participants (296, 56.1%) were between 15-19 years of age whereas the least number of participants (2, 0.4%) were in ≥ 30 years age group. The mean age of the participants was 19±2.43 years. Female participants (376, 71.2%) dominated the study.

A total of 226 (42.8%) participants belonged to a collection of minor tribes described in this study as 'other tribes', followed by participants of Ikwerre tribe (20.4%, n= 108) and Ijaw tribe (16.8%, n=80). Hausa tribe with just 2 (0.4%) participants was the least recruited into the study. Majority of the participants' (80.3%, n=424)) attended private colleges. Medicine and Surgery students (63.6%, n=332) were in the majority followed by nursing students (18.6%, n=98). Students of the departments of biochemistry (1.1%, n=6) and physiology (1.1%, n=6) were the least frequently recruited participants to the study. Participants in their first year of study (26.7%, n=140) were in the majority, followed by third year students (22.7%, n=119) and second year students (22.1%, n=116).

Participant responses to questions on knowledge of hepatitis B

Table 2 shows the distribution of participants based on their responses to questions on knowledge of hepatitis B. Majority of the participants (73.9%, n=387) responded that hepatitis B was infectious and 70.8% (n=374) also responded that hepatitis B was a public health hazard to medical and health students. Two hundred and sixteen participants (41.1%) responded that hepatitis B was transmitted through ingestion of contaminated food and drinks and 60.2% (n=305) responded that hepatitis B was transmitted through hand shake with an infected person. Three hundred and eleven (59.1%) participants did not know whether or not hepatitis B was primarily a disease of the heart and 48.6% (n=255) participants did not know whether or not the disease could be transmitted vertically from mother to foetus in-utero.

The mean (± SD) of participants with good knowledge responses is 249±121.5, poor knowledge responses 81±115.3 and no knowledge responses 198±126.0. The percentage average of participants with good knowledge of hepatitis B was 47.2%, poor knowledge 15.3% and no knowledge 37.5%.

Table 1: Socio-demographic characteristics of medical students at Pamo University of Medical Sciences, Port Harcourt, Nigeria

Socio-demographic variables	Number of respondents (%)
Age in years (Mean ± SD)	19 ±2.43
Age group (years)	
15-19	296 (56.1)
20-24	207 (40.7)
25-29	14 (2.6)
≥30	2 (0.4)
Total	528 (100.0)
Gender	
Male	152 (28.8)
Female	376 (71.2)
Total	528 (100.0)
Tribe	
Ibo	50 (9.4)
Yoruba	6 (1.1)
Hausa	2 (0.4)
Ibibio	11 (2.1)
Ijaw	89 (16.8)
Ogoni	45 (8.5)
Ikwerre	108 (20.4)
Others	226 (42.8)
Total	528 (100.0)
Type of secondary school	
State Public College	41 (7.8)
Federal Government College	63 (11.9)
Private College	424 (80.3)
Total	528 (100.0)
Department	
Anatomy	11 (2.1)
Biochemistry	6 (1.1)
Physiology	6 (1.1)
Medical Laboratory Sciences	39 (7.4)
Medicine and Surgery	332 (62.9)
Nursing	98 (18.6)
Pharmacology	26 (4.9)
Radiology	10 (1.9)
Total	528 (100.0)
Year of study	
1	149 (28.2)
2	116 (22.0)
3	119 (22.5)
4	77 (14.6)
5	67 (12.7)
6	0
Total	528 (100.0)
Monthly allowance (`000 Naira)	
≤99.99	216 (40.9)
10-19.999	157 (29.3)
20-39.999	101 (19.1)
≥40	54 (10.2)
Total	528 (100.0)

Participant responses to questions on awareness of hepatitis B:

Table 3 shows that 60.9% (n=310) of the participants responded that hepatitis B was a risk factor for liver cancer, and 48.3% (n=245) responded that jaundice was a common symptom of hepatitis B. Two hundred and seventy-six participants (54.0%) responded that hepatitis B could be prevented by exercise and 56.3% (n=289) responded that hepatitis B cannot be diagnosed by blood serology. Two hundred and ninety-four (57.8%) participants did not know whether or not Government has free anti-hepatitis B vaccination program for newborns and 66.3% (n=339) did not know whether or not a complete set of hepatitis B vaccination required 3 doses of the vaccine.

The mean (±SD) of participants with good awareness responses was 181±88.3, poor awareness responses 106±86 and no awareness responses 234±49.3. The percentage average of participants with good awareness of hepatitis B is 34.2%, poor awareness 21.5% and no awareness 44.3%.

Table 2.: Distribution of participants responses to questions on knowledge of hepatitis B

Questions	Number of respondents		
	Yes (%)	No (%)	Don't know (%)
Have you heard about hepatitis B infection?	489 (92.6)	19 (3.6)	20 (3.8)
Is hepatitis B an infectious disease?	387 (73.3)	28 (5.3)	113 (21.4)
Is hepatitis B a hazard to medical and health students?	374 (70.8)	24 (4.6)	130 (24.6)
Is hepatitis B infection caused by a virus?	324 (61.3)	16 (3.0)	188 (35.7)
Does hepatitis B infection primarily affect the liver?	189 (35.8)	134 (25.4)	205 (38.8)
Hepatitis B infection does not primarily affect the heart?	110 (20.9)	105 (20.0)	311 (59.1)
Hepatitis B infection does not primarily affect the kidneys?	146 (27.9)	86 (16.4)	292 (55.7)
Is hepatitis B infection is transmitted through food and drinks?	72 (13.6)	219 (41.5)	237 (44.9)
Is hepatitis B infection transmitted through blood transfusion?	348 (65.9)	13 (2.5)	167 (31.6)
Is hepatitis B infection transmitted through tattoos?	183 (34.7)	90 (17.0)	255 (48.3)
Is hepatitis B infection transmitted through sex?	296 (56.1)	44 (8.3)	188 (35.6)
Is hepatitis B infection transmitted via contaminated sharps injury?	304 (57.6)	22 (4.1)	202 (38.3)
Is hepatitis B infection transmitted from mother to baby in-utero?	258 (48.9)	15 (2.8)	255 (48.3)
Is hepatitis B infection transmitted via contaminated hair clippers?	196 (37.1)	94 (17.8)	238 (45.1)
Hepatitis B infection is not transmitted through hand-shake?	58 (11.0)	305 (57.8)	165 (31.2)
Mean ± SD of participants' responses	249±121.5	81±115.3	198±126
Percentage average responses on knowledge of hepatitis B	47.2%	15.3%	37.5%

SD=Standard deviation

Table 3: Distribution of participants responses to questions on awareness of hepatitis B

Questions	Number of respondents		
	Yes (%)	No (%)	Don't Know (%)
Can Hepatitis B be prevented by vaccination?	357 (67.6)	18 (3.4)	153 (29.0)
Is Hepatitis B not preventable with exercise?	42 (8.0)	276 (52.3)	210 (39.8)
Is Hepatitis B not preventable by dietary measures?	116 (22.0)	170 (32.2)	242 (45.8)
Can Hepatitis B be prevented by good hand hygiene?	225 (42.6)	96 (18.2)	207 (39.2)
Can hepatitis B be prevented by wearing PPE?	192 (36.4)	139 (26.3)	197 (37.3)
Can Hepatitis B be diagnosed by serology?	23 (4.4)	304 (57.6)	201 (38.1)
Is there antiviral therapy for hepatitis B?	243 (46.0)	39 (7.4)	246 (46.6)
Is Hepatitis B a risk factor for liver cancer	310 (58.7)	25 (4.7)	193 (36.6)
Is hepatitis B vaccination to newborns free in Nigeria?	186 (35.2)	48 (9.1)	294 (55.7)
Does hepatitis B vaccination require 3 doses of the vaccines?	156 (29.5)	33 (6.3)	339 (64.2)
Is Jaundice one of the commonest symptoms of Hepatitis B?	266 (50.4)	19 (3.6)	243 (46.0)
Does Government provide free hepatitis B vaccination to adults in Nigeria?	186 (35.2)	50 (9.5)	292 (55.3)
Do you know the hepatitis B infection status of your siblings?	165 (31.3)	173 (32.8)	190 (36.0)
Do you know your hepatitis B status?	220 (41.7)	101 (19.1)	207 (39.2)
Have you completed your hepatitis B vaccination?	124 (23.5)	197 (37.3)	207 (39.2)
Mean ± SD of participants responses	181±88.03	106±86.0	234±49.3
Percentage average responses on awareness of hepatitis B	34.2%	21.5%	44.3%

SD=Standard deviation

Relationship between participants knowledge and awareness of hepatitis B:

There was a statistically significant positive correlation between knowledge and awareness of hepatitis B among the study participants (r=0.720, N=516, p<0.0001).

Predictors of knowledge of hepatitis B among participants using binary logistic regression analysis:

Table 4 shows the relationship between participants knowledge of hepatitis B and predicting/associated factors using binary logistic regression analysis model. The percentage average knowledge was set as the dependent variable while predictors included the following factors; tribe, school, departments, year of study, and age group, which was entered as the covariate, with calculation of their corresponding odds ratio (ORs) and respective 95% confidence intervals (95% CIs).

None of the explanatory variables was significant effective predictor except the age of the participants (OR=0.77, 95% CI 0.70-0.84, p<0.0001), which indicates that with a unit decrease in age of the participants by a factor of 0.77, there is a corresponding decrease in participants knowledge of hepatitis B.

Predictors of awareness of hepatitis B among participants using binary logistic regression analysis:

Binary logistic regression analysis was also used to determine the association of participants awareness of hepatitis against some potential predictors/factors. The predictor variables included the participants age (entered as a covariate) and others such as participants' tribe, school, departments, and year of study, were entered as factors (Table 5).

Table 4: Binary logistic regression analysis of predictors of knowledge of hepatitis B among the study participants

Predictors	Statistics of percentage average knowledge of hepatitis B			
	Odds Ratio	95% CI		*p* value
		Lower	Upper	
Mean age	0.77	0.70	0.84	<0.0001*
Tribe				
Ibo	1.03	0.67	1.60	0.929
Yoruba	0.29	0.11	0.76	0.134
Hausa	0.0	0.0	.	0.999
Ibibio	.0.78	0.35	1.73	0.718
Ijaw	1.01	0.70	1.44	0.988
Ogoni	2.33	1.31	4.15	0.091
Ikwerre	0.97	0.70	1.34	0.909
Others+				
Secondary College				
State Public College	0.66	0.44	1.00	0.25
Federal Government College	0.90	0.61	1.33	0.7
Private College+				
Department				
Anatomy	1.13	0.31	4.04	0.916
Biochemistry	4.04E+8	0.00	.-	0.999
Physiology	1.25	0.26	5.91	0.869
Medical Laboratory Sciences	0.83	0.30	2.29	0.835
Medicine and Surgery	0.90	0.36	2.27	0.898
Nursing	0.49	0.19	1.27	0.387
Pharmacology	6.25	1.42	27.58	0.158
Radiology+				
Year of Study				
Year 1	1.36	0.37	4.94	0.787
Year 2	2.7	0.72	10.20	0.390
Year 3	1.39	0.38	5.09	0.772
Year 4	0.25	0.07	0.92	0.219
Year 5	0.12	0.03	0.43	0.058
Year 6+				

Significant at $p<0.05$, + = Reference variable

There was statistically significant association of percentage average awareness of hepatitis B with age of participants (OR=0.84, 95% CI 0.78 - 0.90, p=0.004), Ijaw tribe (OR=0.4, 95% CI 0.24 - 0.66, p=0.034), and attendance of Federal Government College (OR=0.4, 95% CI 0.24 - 0.68, p=0.046). This indicated that the odds of being aware of hepatitis B is decreased by a factor of 0.4 if the participant is an Ijaw compared to being from another tribe. Also, the odds of being aware of hepatitis B is decreased by a factor of 0.4 if the participant attended Federal Government College compared to those who attended a private college.

Discussion:

Students between the ages of 15-19 years (56.1%, 296) dominated this study and they were mostly females (71.2%, 376). This finding is similar to the report of a related study on hepatitis among students in northwest Nigeria which reported students in the age group 15-25 years (67.8%) who were mostly males (61.0%) as dominating the study (17). Students of medical and health sciences, irrespective of disciplines are mandatorily expected to interact at one time or the other with human body fluids and other potentially infectious materials in the course of their training. The training curriculum should be such that will create enabling environment for good knowledge and awareness build-up on infectious threats including hepatitis B which they might be exposed to in the course of career acquisition and practice. There are reports that hepatitis B is transmitted 2 to 10 times higher amongst medical professionals (18,19).

In this study, the percentages average good knowledge and awareness of hepatitis B among the participants were 47.2% and 34.2% respectively. These findings are similar to that of a related study in Malaysia (20), which reported that 36.9% and 38.8% of the participants had good knowledge and awareness of hepatitis B respectively. A similar study in Senegal (21) reported that only 27% of the study population had good knowledge of hepatitis B whereas 14.5% and 38.8% had poor knowledge and no knowledge of hepatitis B respectively. Although these findings call for concern, they are however better than the finding of a study in northwest Nigeria where 64.4% of the participants had poor knowledge of hepatitis B (17).

Also, 92.6% (n=489) of the study par-

Table 5: Binary logistic regression of predictors of awareness of hepatitis B among the study participants

Predictors		Statistics of percentage average awareness of hepatitis B			
		Odds Ratio	95% CI		P value
			Lower	Upper	
Age		0.84	0.78	0.90	0.004*
Tribe					
	Ibo	0.99	0.47	2.14	0.929
	Yoruba	1.02E+8	0.0		0.99
	Hausa	102E+8	0.0	.	0.999
	Ibibio	0.64	0.18	2.23	0.718
	Ijaw	0.4	0.24	0.66	0.034*
	Ogoni	0.89	0.42	1.91	0.863
	Ikwerre	0.97	1.05	4.72	0.218
	Others+				
Secondary College					
	State Public College	0.53	0.28	1.02	0.265
	Federal Government College	0.40	0.24	0.68	0.046*
	Private College+				
Departments					
	Anatomy	1.8E+8	0.00		0.999
	Biochemistry	1.8E+8	0.00		0.999
	Physiology	1.8E+8	0.00		0.999
	Medical Laboratory Sciences	0.61	0.16	2.28	0.667
	Medicine and Surgery	1.83	0.53	6.34	0.578
	Nursing	1.17	0.32	4.22	0890
	Pharmacology	1.8E+8	0.00		0.158
	Radiology+				
Year of Study					
	Year 1	0.0	0.0		0.999
	Year 2	0.0	0.0		0.999
	Year 3	0.0	0.0		0.999
	Year 4	0.0	0.0		0.999
	Year 5	0.0	0.0		0.999
	Year 6+				

Significant at $p<0.05$, + = Reference

ticipants in our study responded that they have heard about hepatitis B and 73.0% (n= 307) correctly responded that hepatitis B was infectious, but 38.8% (n=205) did not know whether or not hepatitis B was a primary disease of the liver, only 58.0% (n=304) knew that hepatitis B could be transmitted through injury from contaminated sharps, 4.5% (n= 23) of participants were aware that serology was a screening test for hepatitis B, while 48.3% (n=245) knew jaundice as a common symptom of the disease. Although these findings are not impressive, they appeared to be encouraging when compared with the findings of a study in Sri Lanka (22) where out of 64 first year students, only 1 (1.6%) student was aware of all risk factors of hepatitis B including piercings, tattoos, transfusion of blood, and dental care visits, and 40.6% (n=52) of the students were unaware that contaminated blood, contaminated needles, unprotected sex with an infected person, and birth to an infected mother were all modes of hepatitis B transmission (p=0.000).

Most of the participants (56.1%, n= 196) in our study were between the ages of 15-19 years and were mostly in their first and second year of study. This raised the hope of improvement in their percentage knowledge of hepatitis B with progressing age, more so when backed by enabling curriculum of training. Our study supports this because we showed statistically significant association between percentage average knowledge of hepatitis B and age of participants (OR=0.77, 95% CI 0.70-0.84, p<0.0001), which implies that with a unit decrease in age of participant by a factor of 0.77, there is a corresponding decrease in knowledge of participant about hepatitis B. Hence, increased age will conversely be associated with increased knowledge of hepatitis B.

Our study also showed significant statistical associations of participants age (OR= 0.84, 95% CI 0.78-0.90; p=0.004), Ijaw tribe (OR=0.4, 95% CI: 0.24-0.66, p=0.034), and attendance of Federal Government College (OR=0.4, 95% CI 0.24-0.68, p=0.046). This implies that the odds of being aware of hepatitis B is decreased by a factor of 0.4 if participant was an Ijaw compared to being from other tribes. Also, the odds of being aware of hepatitis B is decreased by a factor of 0.4 if participant attended Federal Government College as against attending a Private College.

Similar to the statistically significant association between participants knowledge of hepatitis B and age, for every unit decrease in

the age of participant by a factor of 0.84, there would be a corresponding decrease in participants awareness about hepatitis B. This also raised the hope that this study population, dominated by youthful participants between the ages of 15-19 years of age and still in their junior classes of training, would likely gain remarkable awareness of hepatitis B before entering the clinical segment of their training where they would start interacting with infectious threats, including hepatitis B.

The lower odds of awareness of hepatitis B among Ijaw tribe (OR=0.4) and attendance of Federal Government College (OR= 0.4) cannot be readily explained. The Federal Government Colleges, also known as Unity Schools, were established and funded directly by the Federal Government of Nigeria, which provides them with serene environment for learning characterized by quality teachers, boarding facilities, laboratories, clinics, and well-articulated training curriculum that provides balanced knowledge for the students. It is therefore expected that the level of awareness of hepatitis B should be higher in these Colleges, hence the difficulty for us in explaining the reasons for the lower odds. There is however the possibility that the high standards of these schools at the time they were established may have been negatively affected by the socio-economic challenges of the country leading to lowering of training standards including those of knowledge and awareness of infectious diseases such as hepatitis B. One limitation of our study is the cross-sectional design which cannot establish cause-effect relationship between education/awareness levels and the predictors.

Conclusion:

The percentage average good knowledge of 47.2% and awareness of 34.2% for hepatitis B in our study are low. However, most of participants in the study were between the ages of 15-19 years and mostly in their first and second year of study. There is thus the hope of improvement in knowledge and awareness of hepatitis B with progression in age and year of training. Good knowledge and awareness of hepatitis B remained one of the pivotal strategies for the realization of the planned global elimination of the disease as a public health challenge by the World Health Organization on or before 2030.

The National Universities Commission (NUC) in conjunction with the Medical and Dental Council of Nigeria (MDCN) should review the current academic curricula of medical schools to promote amongst others, good knowledge and awareness of hepatitis B and other infectious diseases that the students would be exposed to in the course of their clinical skill acquisitions.

Introduction of a yearly campus seminar on infection prevention and control as part of the orientation programme for fresh students aimed at promoting knowledge and awareness of not only hepatitis B but infectious diseases generally is recommended. This will in the long term, institutionalise good knowledge and awareness of infectious diseases among medical students, well enough to safely guide them in the course of their training.

Contributions of authors:

The study was conceptualized by GIO and AAI. All authors were involved in the literature searches. USN and EUE wrote the manuscript. EUE and EL edited the final copy of the manuscript which was read and approved by all the authors.

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