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# Knowledge, risk perception and utilization of hepatitis B vaccine among youths in a semi-urban area in Ibadan, Oyo state, Nigeria

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## ABSTRACT

**Introduction and aim.** Hepatitis B is a chronic liver disease responsible for high morbidity and mortality. Despite the availability of hepatitis B vaccine, the incidence of disease is increasing. This study was designed to investigate the knowledge, risk perception, and utilization of hepatitis B vaccine among youths in the Ido Local Government Area, Oyo state, Nigeria.

**Material and methods.** A cross-sectional survey design was adapted, and 422 consenting youths were recruited. A pre-tested semi-structured questionnaire was used for data collection. A 19-point knowledge scale was used; scores  $\leq 6$ ,  $>6-12$ , and  $>12-19$  were considered poor, fair and good knowledge, respectively. Risk perception was measured on a 14-point scale, with scores  $\leq 7$  and  $>7$  as poor and good, respectively. Data were analyzed using descriptive statistics, Chi-square and Fisher's exact at  $\alpha_{0.05}$ .

**Results.** Respondents were  $26.6 \pm 3.5$  years, and 56.2% were females. Only 13.7% had good knowledge of hepatitis B, and 53.2% had a good perception of hepatitis B infection. Moreover, 48.9% had received at least one dose of the Hepatitis B vaccine. A significant association existed between knowledge, risk perception and utilization of hepatitis B vaccine.

**Conclusion.** Knowledge and utilization of hepatitis B vaccine were low among the respondents. Health education programs in the study area are crucial to improving hepatitis B vaccine utilization among youth.

**Keywords.** hepatitis B, risk perception, youths, vaccine uptake

## Introduction

Hepatitis B virus (HBV) affects a large number of people worldwide and accounts for over 820,000 deaths per year. About 90% of infected people with hepatitis B are unaware of their infection and do not seek treatment which contributes to a significant share of hepatitis mortality and morbidity.<sup>1</sup> Although vaccines to prevent the disease have been available since the 1980s, the incidence of hepatitis B is still increasing.<sup>2</sup> The lack of, or the ineffectiveness of hepatitis management initiatives in the sub-Saharan region of Africa could be responsible for this increase in hepatitis B.<sup>3</sup> The high mortality and morbidity that results is because people can live asymptotically with the virus for up to 30 years. As a result, testing is typically conducted after the disease has progressed to a chronic stage and liver cirrhosis is already severe.<sup>3</sup>

According to estimates, the burden of hepatitis B infection is highest in the WHO Western Pacific Region and the WHO African Region which comprises 116 million and 81 million chronically infected people, respectively.<sup>4</sup> This figure accounts for 23% of all cases of the disease worldwide. Hepatitis B prevalence in Nigeria ranges from 7.3% to 24% among different populations and may reach 64% among those with liver cancer.<sup>1,4,5-8</sup>

Furthermore, 20 million Nigerians are infected with HBV, and about 5 million die as a result of the consequences<sup>9</sup>. Seroprevalence studies conducted in different regions among diverse populations in Nigeria have shown that the infection rate varies from 2.3% to 13% among healthcare workers, 11.4% among students in the University of Maiduguri and 12.2% among the general population. According to Oyero and Omoruyi, the prevalence of HBV infection in Oyo State is 22%.<sup>10,11</sup> Hepatitis B infection is putting an increased economic burden on families, communities, and the country, and is the tenth leading cause of death and is more infectious than the human immunodeficiency virus (HIV).<sup>12</sup> Despite the availability of effective vaccines, low vaccine utilization has been recorded among community members in addition to a lack of information regarding prevalence and awareness among youths in Nigeria.

Thus, the disease is still endemic in the country. Although the vaccine is included in the National Immunization Program (NPI), there is little advocacy on the need for vaccination among the general population. Young adults (18–35 years old) represent 25% of the sexually active population. Nearly 50% of all newly acquired Sexually Transmitted Infections (STIs) are primarily caused by sexual ignorance, sexual abuse, non-use of condoms, increased number of relationships between young persons and older partners, use of psychoactive substances, and poor attitude in the utilization of healthcare services.<sup>13</sup> In Nigeria, the vaccination of young adults has not had similar implementation success compared to child vaccinations. Scanning through the national HIV/AIDS and STIs Control Program National Policy for the Control of Viral Hepatitis in Nigeria 1st edition 2015, the national policy for the control of viral hepatitis in Nigeria emphasizes the need for public enlightenment on the transmission of viral hepatitis and vaccination, especially among healthcare workers, mothers of infants, and sex workers.<sup>12</sup> However, no information is provided that focuses on youths (young adults) as a high-risk group. Since hepatitis B high-

risk groups can serve as reservoirs and carriers of the infection locally and as determinants of its prevalence internationally, the youths must be appropriately identified and monitored if universal prevention and control of disease spread is to be achieved.

## **Aim**

While most studies focus on healthcare workers, medical students, and public safety workers, there are limited studies among the general population, particularly the youth. Hence, this study aimed to investigate the knowledge, risk perception and utilization of hepatitis B vaccine among youths aged 18–35 in the Ido Local Government Area (LGA), Oyo State, Nigeria.

## **Material and methods**

### ***Ethical approval***

Ethical approval for the study was obtained from the Oyo State Research Ethical Review Committee (Ref. No.: A.D. 13/479/304B). Also, written informed consent was obtained from each participant to assure them of voluntary participation and confidentiality associated with the data collection procedures.

### ***Study design and setting***

This was a cross-sectional design study that analyzed data of variables collected using a quantitative instrument at one given time across samples of youths from randomly selected wards and communities in Ido LGA in Oyo State.

### ***Study population***

The study population was comprised of young residents in the Local Government Area aged 18 to 35 years—as chronologically defined youth in the 2009 National Youth Policy and according to African Youth Charter.<sup>14</sup> This study population was of interest because there has been no research carried out among the population regarding this subject matter. Moreover, the Centers for Disease Control and Prevention have flagged youth to be at risk of hepatitis B and associated diseases.<sup>15,16</sup> The inclusion criteria considered youths living within the study area who were 18–35 years old and voluntarily participated in the survey. The exclusion criteria were youth visiting the study area at the time of the study, those who were indisposed at the time of the study, those who refused consent to complete the questionnaire, and those who withdrew from completing the questionnaire.

### ***Sample size and sampling procedure***

The sample size required for this study was calculated using 50% as a proxy, as no existing research focused on youths in Nigeria. At 5% tolerable error, 95% confidence and adjusting for 10% non-response. A

minimum sample size of 422 was calculated. A multistage sampling technique was adopted to select respondents for this study. Oyo State is divided into five zones. Simple random sampling was used to select one Zone in the State. Ibadan Zone 1 was selected, and the Zone has 11 Local Government Areas (LGAs). Five LGAs (Ibadan North, Ibadan North East, Ibadan North West, Ibadan South West and Ibadan South East) are in the city's metropolitan area. Other LGAs (Akinyele, Egbeda, Ido, Lagelu, Oluyole & Ona-Ara) are semi-urban. The Ido Local Government Area was also randomly selected from the six semi-urban LGAs through simple random sampling (balloting). The Ido LGA has ten political wards, of which five were chosen randomly, comprising the study sites.

### ***Data collection***

A pre-tested semi-structured interviewer-administered questionnaire developed by the researchers in line with the reviewed literature was used to elicit information from the respondents. The authors used the Cronbach alpha coefficient as a measure of the instrument's internal consistency. The Cronbach Alpha coefficient for this instrument was 0.74, indicating that the instrument is reliable. The questionnaire comprised five sections with a total of 63 items. The sections were designed to elicit the following information on the sociodemographic characteristics of the respondents (8 items), Awareness of hepatitis B among respondents (2 items), knowledge of hepatitis B among respondents (19 items), risk perception of hepatitis B among respondents (14 items) and the level of utilization of hepatitis B vaccine among respondents (8 items) and barriers to utilization of hepatitis B vaccine (12 items). Seven research assistants were trained on the ethics of research work and procedures essential to conducting the study. Houses in the selected wards were enumerated, and simple random sampling via balloting was used to select respondents from the enumerated houses. In places with more than one eligible respondent, balloting was used to select one of the respondents.

### ***Statistical analysis***

Completed questionnaires were coded with the aid of a developed coding guide and entered into the IBM/Statistical Package for Social Science (IBM/SPSS version 26). The sociodemographic information was described using descriptive statistics, showing frequency in frequency distribution tables and charts. Knowledge was measured on a 19-point scale; scores  $\leq 6$ ,  $>6-12$  and  $>12-19$  were considered poor, fair and good knowledge, respectively. Also, the risk perception was measured on a 14-point scale, where  $\leq 7$  was considered poor perception and  $>7$  was considered good perception. Quantitative data was analyzed using descriptive statistics, Fisher's exact and Chi-square. Further analysis was also done for significance using multinomial regression to determine the magnitude of association at  $\alpha_{0.05}$ .

## Results

The average respondent's age was  $26.6 \pm 3.5$  years, and 56.2% were females. Respondents with tertiary education accounted for 60.4%, 36% were self-employed, 63% were single, and most (59.5%) earned less than 30,000 Naira as average monthly income (Table 1).

**Table 1.** Sociodemographic information of the respondents

<b>Variables</b>	<b>n</b>	<b>%</b>
<b>Age (in years)</b>		
≤ 20	75	17.8
21 to 25	104	24.6
26 to 30	131	31
31 to 35	112	26.5
<b>Sex</b>		
Male	185	43.8
Female	237	56.2
<b>Education</b>		
Primary	26	6.2
Secondary	141	33.4
Tertiary	255	60.4
<b>Occupation</b>		
Civil servant	23	5.5
Artisan	42	10
Student	138	32.7
Unemployed	8	1.9
Self-employed	152	36
Private worker	59	14
<b>Marital Status</b>		
Single	266	63
Married	152	36
Divorced	2	0.5
Widowed	2	.5
<b>Average monthly income</b>		
Below 30000	251	59.5
Above 30000	171	40.5

### **Responses on knowledge of hepatitis B**

The respondents' knowledge of hepatitis B is presented in Table 2. For general knowledge of hepatitis B transmission, some of the respondents (35.3%) knew that the disease can be transmitted through unprotected sex. About the signs and symptoms, almost half of the respondents (43.2%) were unaware of the symptoms of the disease, and only 19.8% knew that yellowing of the eyes and skin (Jaundice) is one of the symptoms of the infection.

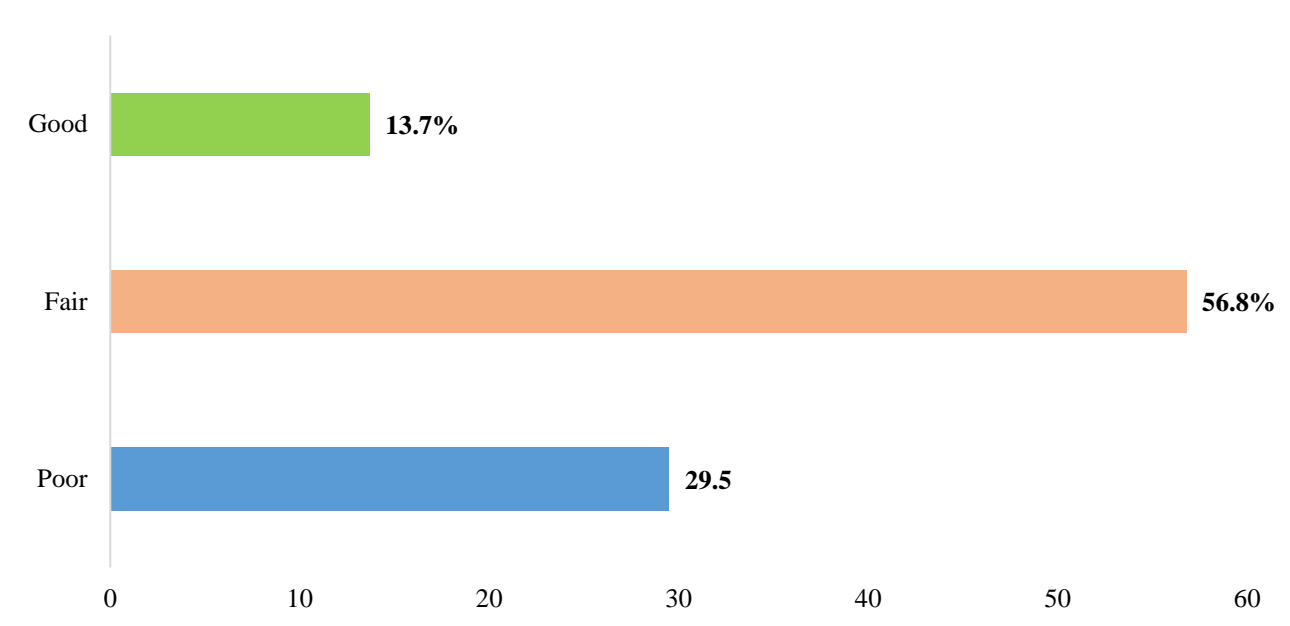
**Table 2.** General knowledge of HBV (n=278)<sup>a</sup>

<b>Statement</b>	<b>n</b>	<b>%</b>
<b>Hepatitis B can be transmitted through *</b>		
Unprotected sex#	98	35.3
I do not know	70	25.2
Through sweat	51	18.3
Blood transfusion	38	13.7
Blood contact#	29	10.4
Body fluid#	26	9.4
Sharing sharp objects#	16	5.8
Mother to child#	14	5.0
<b>Signs and symptoms of hepatitis B *</b>		
Yellowing of eyes and skin#	55	19.8
Weight loss	36	12.9
Dark urine#	28	10.1
Fever#	26	9.4
Abdominal pain	24	8.6
Weakness	19	6.8
Eye redness	8	2.9
Joint pain#	7	2.5
Nausea#	5	1.8
Vomiting#	5	1.8
Bloated stomach	2	0.7
Others	1	0.4
I don't know	120	43.2

<sup>a</sup> \* – multiple responses, # – correct responses

### Respondents level of knowledge of hepatitis B virus infection

The knowledge level was assessed using 19-item open-ended questions. It was observed that less than a quarter of the respondents (13.7%) had good knowledge of hepatitis B, 56.8% had fair knowledge, and 29.5% had poor knowledge, with a knowledge score of  $8.4 \pm 3.4$  (Fig. 1).



**Fig 1.** Respondents' knowledge of hepatitis B

### *Respondents' risk perception on hepatitis B*

The respondents' risk perception is presented in Table 3. Almost half (48.9%) agreed to be at risk of exposure to HBV, while slightly above half (53.6 %) disagreed with the statement that since no one has a history of HBV in their family, they are not prone to it, 61.9% agreed that since they do not live with a person that is infected with hepatitis B, they are free from HBV. More than half (51.4%) also agreed that since they do not have multiple sexual partners, they are not prone to HBV. Slightly above half (51.8%) disagreed that since they are not exposed to human blood, they are free from HBV, and 48.2% also agreed that being prayerful persons, they are covered. Finally, 47.1% agreed that HBV is not common but rather over-emphasized.

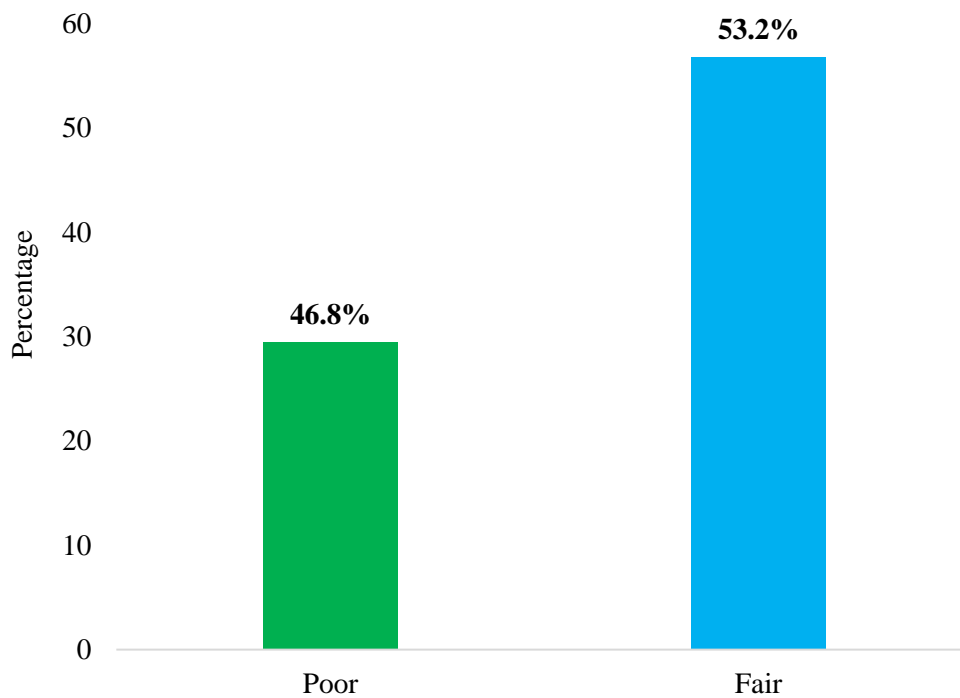


**Table 3.** Response on risk perception (n=278)

<b>Statement</b>	<b>Agree Freq. (%)</b>	<b>Disagree Freq. (%)</b>
You are at risk of exposure to HBV	136 (48.9)	142 (51.1)
No one has a history of HBV in my family, so I am not prone to it	129 (46.4)	149 (53.6)
Since I do not live with a person who is infected with Hepatitis B, I am free from HBV	172 (61.9)	106 (38.1)
Since I do not have multiple sexual partners, I am not prone to HBV	135 (48.6)	143 (51.4)
Since I am not exposed to human blood, I am free from HBV	134 (48.2)	144 (51.8)
I am a prayerful person, I am covered	134 (48.2)	144 (51.8)
HBV is not common disease; it is just over-emphasized	131 (47.1)	147 (52.9)

***Respondents risk perception score on hepatitis B***

The risk perception was assessed using a 14-item scale. Findings revealed that more than half of the respondents (53.2%) had a good perception of hepatitis B infection (Fig. 2), with a score of  $7.2 \pm 3.4$ .



**Fig 2.** Respondents' risk perception score on hepatitis B

***Level of utilization of hepatitis B vaccine***

Almost half (48.6%) of the respondents had been screened for hepatitis B. Less than one-quarter, 23.7%, were vaccinated against hepatitis B, 39.4% received their first dose more than six months before the study, and 33.3% had their first dose between one month and six months before the survey. More than one-third, 39.4%, reported they had received two doses of the vaccine, and 4.5% were unsure of the number(s) of dose (s) they have received so far. About the location where the vaccination was provided, 24.2% received the vaccine from a secondary health facility (Table 4).

**Table 4.** Respondent's uptake of hepatitis B vaccine

<b>Variable</b>	<b>n</b>	<b>%</b>
<b>Screened against hepatitis B</b>		
No	138	49.6
Yes	135	48.6
Not sure	5	1.8
<b>Ever been vaccinated against hepatitis B (n=135)</b>		
No	69	51.1
Yes	66	48.9
<b>When the first dose was</b>		
More than six months ago	26	39.4
Between one month and six months ago	22	33.3
About one month ago	2	3
Not sure	16	24.2
<b>Point of vaccination</b>		
<b>Private hospital</b>	13	19.7
Secondary health centre	16	24.2
Tertiary health centre	16	24.2
Primary health centre	15	22.7
Others +	6	9.1
<b>Number of doses received so far</b>		
One	24	36.4
Two	26	39.4
Three	13	19.7
Not sure	3	4.5

A significant association between respondents' level of education, occupation, and knowledge of hepatitis B was found ( $p < 0.001$ ) ( $p = 0.005$ ). However, other sociodemographic characteristics were not statistically significantly associated with knowledge of hepatitis B infection (Table 5).

**Table 5.** Relationship between respondents' sociodemographic characteristics and knowledge of hepatitisB infection<sup>a</sup>

Variable	Knowledge Category			df	$\chi^2$	p
	Poor n (%)	Fair n (%)	Good n (%)			
<b>Sex</b>						
Male	34 (41.5)	63(39.9)	10 (26.3)	2	2.813	0.251
Female	48 (58.5)	95(60.1)	28 (73.7)			
<b>Age</b>						
≤20	10 (12.2)	27 (17.1)	10 (26.3)	6	6.867	0.336
21–25	20 (24.4)	42 (26.6)	9 (23.7)			
26–30	29 (35.4)	46 (29. 1)	14 (36.8)			
31–35	23 (28.0)	43(27.2)	5 (13.2)			
<b>Average monthly income</b>						
Below 30,000	42 (51.2)	97 (61.4)	18 (47.4)	2	3.758	0.164
Above 30,000	40 (48.8)	61 (38.6)	20 (52.6)			
<b>Highest level of education</b>						
Primary	6 (7.3)	5 (3.2)	0 (0)	3	24.648	<0.001**
Secondary	29 (35.4)	36 (22.8)	0 (0)			
Tertiary	47 (57.3)	117 (74.1)	38 (100)			
<b>Marital status</b>						
Single	49 (59.8)	101 (63.9)	29 (76.3)	2	5.445	0.264
Married	32 (39.0)	57 (36.1)	9 (23.7)			
Divorced	1 (1.2)	0 (0.0)	0 (0)			
<b>Occupation</b>						
Civil servant	8 (9.8)	11 (7.0)	0 (0)	10	25.132	0.005**
Artisan	9 (11.0)	7 (4.4)	0 (0)			
Student	17 (20.7)	59 (37.3)	20 (52.6)			
Unemployed	2 (2.4)	3 (1.9)	0 (0.0)			
Self-employed	36 (43.9)	52 (32.9)	9 (23.7)			
Private worker	10 (12.2)	26 (16.5)	9 (23.7)			

<sup>a</sup> \*\* – statistically significant,  $\chi^2$  – Chi-square value, df – degree of freedom

The study showed a significant association between knowledge of hepatitis B and risk perception of the disease ( $p < 0.001$ ) (Table 6). Similarly, a significant association was also found between knowledge of hepatitis B infection and the uptake of hepatitis B vaccine among the respondents ( $p < 0.001$ ) (Table 7).

**Table 6.** Relationship between respondents' knowledge of hepatitis B infection and the risk perception of hepatitis B vaccine<sup>a</sup>

Variable	Perception Category		df	$\chi^2$	p
	Poor n (%)	Good n (%)			
<b>Knowledge</b>					
Poor	56 (68.3)	26 (31.7)	2	23.125	<0.001**
Fair	36 (34.6)	95 (60.1)			
Good	11 (28.9)	27 (71.1)			

<sup>a</sup> \*\* – statistically significant,  $\chi^2$  – Chi-square value, df – degree of freedom

**Table 7.** Relationship between respondents' knowledge of hepatitis B infection and the uptake of hepatitis B vaccine<sup>a</sup>

Variable	Uptake Category		df	$\chi^2$	p
	No uptake, n (%)	Uptake, n (%)			
<b>Knowledge</b>					
Poor	79 (37.3)	3 (4.5)	1	39.827	<0.001**
Fair	116 (54.7)	42 (63.7)			
Good	17 (8.0)	21 (31.8)			

<sup>a</sup> \*\* – statistically significant,  $\chi^2$  – Chi-square value, df – degree of freedom

There was a significant association between risk perception of hepatitis B infection and the uptake of the hepatitis B vaccine ( $p = 0.007$ ) (Table 8).

**Table 8.** Relationship between respondents' risk perception of hepatitis B infection and the uptake of Hepatitis B vaccine<sup>a</sup>

Variable	Uptake Category		df	$\chi^2$	p
	No uptake, n (%)	Uptake, n (%)			
<b>Risk perception</b>					
Poor	109 (83.8)	21 (16.2)	1	7.764	0.007**
Good	103 (69.6)	45 (30.4)			

<sup>a</sup> \*\* – statistically significant,  $\chi^2$  – Chi-square value, df – degree of freedom

Multinomial regression analysis revealed that respondents who have higher knowledge of hepatitis B infection were 4.8 times more likely to uptake the hepatitis B vaccine rather than not uptake the hepatitis B vaccine ( $p < 0.001$ ) (Table 9).

**Table 9.** Association between respondents' knowledge of hepatitis B infection and the level of uptake of the hepatitis B vaccine<sup>a</sup>

Variables	Sig.	OR	95% Confidence interval	
			Lower bound	Upper bound
Knowledge	<0.001**	4.856	2.839	8.305

<sup>a</sup> \*\* – statistically significant, OR – odds ratio

Logistic regression analysis revealed that respondents who have a good risk perception towards hepatitis B infection were 3.0 times more likely to uptake the hepatitis B vaccine ( $p < 0.001$ ) (Table 10).

**Table 10.** Association between respondents' risk perception of hepatitis B infection and uptake of hepatitis B vaccine<sup>a</sup>

Variables	Sig.	OR	95% Confidence interval	
			Lower bound	Upper bound
<b>Risk Perception</b>				
Poor	–	–	–	–
Good	<0.001**	3.016	1.576	5.773

<sup>a \*\*</sup> – statistically significant, OR – odds ratio

## Discussion

The level of good knowledge (13.7%) reported in this study was lower than the findings in some similar studies. Yakudima et al. recorded 35% good knowledge among respondents in part of Jigawa State, Nigeria.<sup>17</sup> Analyzing the study by Alotaibi et al., it was found that 42% of the respondents had poor knowledge of HBV.<sup>18</sup> Although the majority had received a formal education, our findings suggest that health issues such as HBV may not be adequately emphasized in educational settings and literature within the public domain.

This study revealed that 25.2% of the respondents did not know how hepatitis B can be transmitted, which is lower than the study by Okonkwo et al. among healthy adults, which revealed that 40% of the respondents did not know how HBV can be transmitted.<sup>19</sup> The identified modes of transmission observed in this study, such as blood contact, blood transfusion, infected needles, mother-to-child and unprotected sexual intercourse, align with the findings of Zafrin et al.<sup>20</sup>

Hassan-Gillani et al. also pointed out that most respondents knew of the existence of the hepatitis B vaccine; however, respondents could not identify the age groups required to take the vaccine and the number of doses.<sup>21</sup> Furthermore, Adam and Fusheini found a correlation between education level, HBV vaccination, and screening, which can be attributed to at least two factors.<sup>22</sup> First of all, hepatitis B is a complicated disease with a range in its natural history, course, and therapeutic therapy such that people with low levels of education may find it challenging to comprehend and digest information on hepatitis B. Second, higher education students are more likely to have a superior understanding because they have easier access to HBV information from various sources. There are two significant consequences of these findings. Firstly, community people with poor educational attainment should be the focus of intervention initiatives to enhance knowledge. Secondly, information related to HBV being used in prevention programs needs to be simplified so that it is easy to understand for households with low academic education. Another important finding is the perceived effect of knowledge on health-seeking behavior, and respondents indicated they would visit the health facility for treatment if they were infected with hepatitis B, which shows they have good health-seeking behavior.

According to Patil et al. study among laboratory technicians, hygienists, laundry workers, and the housekeeping staff in a medical and dental hospital documented 67.2% positive risk perception among respondents, which is slightly higher than the findings of this study.<sup>23</sup> A study by Chingle et al. revealed that respondents had a 76.8% overall risk perception of hepatitis B infection, which is higher than the study findings due to the respondents being medical students with expansive lectures in virology.<sup>12</sup> In another study by Ochu and Beynon, they recorded 55.3% good perception among the study respondents, and the

findings are lower than those in this study.<sup>24</sup> This could be a result of the poor knowledge levels among the respondents.

A strong predictor for poor risk perception is poor knowledge. This study found a significant perception gap where most respondents believed they were not at risk of exposure because they did not live with an infected person. The perception gap can also be linked to a lack of understanding of how the hepatitis B virus can be transmitted. In a study conducted among cleaners in a tertiary hospital in Nigeria, among the respondents, 13.5%, 13.5% and 21.3% had low, medium and high-risk perceptions of acquiring hepatitis B infection, respectively, which is slightly lower than the findings of this study<sup>19</sup>. According to a survey conducted in Jos among students at higher institutions, the University of Jos students had a high-risk perception of HBV infection. It was discovered that 76.8% of the students in the survey had a positive risk perception of hepatitis, with 40.7% of medical students and 40.1% of nursing students having a positive risk perception of hepatitis B, respectively. However, among public administration students, the risk perception of hepatitis B was found to be 9.1%, which is lower than the national average.<sup>12</sup>

The ultimate goal of the fight against HBV is to prevent new infections, and the most effective means of achieving zero infections is vaccination against the virus. However, the finding in this study is that there is a very low utilization of the hepatitis B vaccine among the population, which may reflect the true situation in many peri-urban communities in Nigeria.<sup>25</sup> The finding of this study showed that only 15.6% of the sampled respondents had received at least one dose of the hepatitis B vaccine, the finding is lower than the study by Tatsilong et al., which revealed that only 19% of the study population had received at least one dose of the hepatitis B vaccine.<sup>26</sup> A study conducted by Machmud et al. among the adult population in Indonesia reported that only 15% of the study respondents received at least one dose of the hepatitis B vaccine.<sup>27</sup> Another study conducted by Anthony and Babatunde among HCWs similarly reported low uptake of the hepatitis B vaccine, which is worrisome.<sup>28</sup>

This study also revealed that receiving accurate information about hepatitis B infection and the advantages of vaccination is one of the best preventive measures related to hepatitis B vaccination. Njoroge et al. discovered that direct information from healthcare providers was most closely connected with receiving a hepatitis B vaccination, even though information about hepatitis B and immunization is accessible through the media, including television, scholarly journals, and the internet.<sup>29-32</sup> Ochu and Beynon revealed that the higher the perceived risk of contracting hepatitis B, the higher the awareness of the need for vaccination, similar to this study.<sup>25</sup> According to the Health Belief Model, the person's demographic traits and level of knowledge are modifying factors. It is hypothesized that various demographic and cognitive characteristics influence a person's perception, which may affect their health-related behavior. For instance, it is thought that educational attainment influences an individual's perception of the benefits-barriers of the action agent (such as the safety, efficacy, and affordability of the vaccine being used to reduce that threat) and perceived



threat-agent benefits-barriers of the recommended health action or behavior (such as the susceptibility to and severity of the infection).<sup>33</sup>

The implication of this finding for Nigerian youths, in particular, is that many people may still be unvaccinated and unprotected against HBV due to poor risk perception and continue to face the risk of HBV infection. This placed Nigeria on the negative side of progress in meeting sustainable development goal 3 regarding HBV infection control. The low uptake of the HBV vaccine identified in this study population may be because 82.1% of the respondents were born before the mandatory HBV vaccination for all infants was introduced in Nigeria in 2002. Therefore, continuous education is germane to change the negative trend if significant progress is made in preventing HBV among the youth.

## **Conclusion**

There is a significant disparity in knowledge about HBV infection, screening, and vaccination among youths in Ido LGA. The poor level of knowledge and the high risk of HBV infection among the respondents have been highlighted in the findings of this study. The outcome also demonstrates that vaccination against HBV infection was low and consistent with other findings.

The findings of this study are significant in helping to highlight the gaps in the Sustainable Development Goal 3 on reducing infectious diseases, including HBV infection. Indeed, significant progress was reported regarding global HBV incidence and prevalence, whereby newborn infections of chronic HBV have decreased from 4.7% during the pre-vaccination era to 0.8% in 2017. However, there is a gap that needs to be bridged; there are still so many people who were born before the mass vaccination initiation and who continue to face the risk of infection, as found in this study. Therefore, there is a need for a culturally appropriate and evidence-based educational intervention to improve the knowledge of HBV. Additionally, developing and implementing national HBV screening and vaccination programs for the adult population are critical in winning the fight against the increasing morbidity and mortality associated with hepatitis B infections in Nigeria.

## **Declarations**

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### ***Author contributions***

Conceptualization, B.T.O., O.P.A. and I.O.D.; Methodology, B.T.O. and I.O.D.; Software, B.T.O. and I.O.D.; Validation, B.T.O., O.P.A. and I.O.D.; Formal Analysis, B.T.O. and I.O.D.; Investigation, B.T.O., O.P.A. and I.O.D.; Data Curation, B.T.O., O.P.A. and I.O.D.; Writing – Original Draft Preparation, B.T.O.,

O.P.A. and I.O.D.; Writing – Review & Editing, B.T.O., O.P.A. and I.O.D.; Visualization, B.T.O.; Supervision, I.O.D.; Project Administration, B.T.O. and I.O.D.

### ***Conflicts of interest***

All authors declare that they have no conflict of interest

### ***Data availability***

The data sets generated during and/ or analyzed during the current study are available from the corresponding author upon reasonable request.

### ***Ethics approval***

Ethical approval for the study was obtained from the Oyo State Research Ethical Review Committee (Ref. No.: A.D. 13/479/304B).

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