

# Perception and Practices relating to Hepatitis B Infection among In-school Adolescents in Ogun State, Nigeria

Olaoye T<sup>1</sup>, Agbede CO<sup>1</sup>, Oshiname FO<sup>1</sup>

<sup>1</sup>Department of Public Health, Babcock University, Ilishan Remo, Ogun State Nigeria

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## Abstract

**Objective:** This study examined the perception and practices relating to Hepatitis B infection among In-school adolescents in Ogun State, Nigeria.

**Methods:** A cross-sectional study of 300 in-school adolescents selected by a multi-stage sampling method. Data were elicited using a pretested self-administered questionnaire which included questions relating to respondents' risky practices, and a 35-point Hepatitis B perception scale. Descriptive statistics, as well as Chi-square statistics, were generated using IBM SPSS Version 23, and the significance level was set at 0.05.

**Results:** The mean age of the respondents was  $14.31 \pm 1.73$  years and slightly over half (51.7%) were females. Less than half (45%) of the adolescents perceived themselves to be susceptible to Hepatitis B infection, while 31% perceived Hepatitis B infection to be a serious disease. Almost half (49%) of the adolescents had unfavorable perceptions. The most common risky practices among the respondents were sharing skin-piercing instruments with their family members (79%) and friends (68.7%). There are significant associations between sex (gender) and risky practices such as the practices of unsafe sex ( $X^2= 9.11$ ;  $p=0.10$ ); having multiple sexual partners ( $X^2= 12.08$ ;  $p=0.02$ ); and sharing skin-piercing instruments ( $X^2= 5.52$ ;  $p=0.01$ ) with more males reporting the above practices than females.

**Conclusion/Recommendation:** To minimize the identified risky practices and unfavorable perception, educational intervention programs aimed at promoting Hepatitis B virus preventive behaviors and increasing the level of perception of vulnerability and seriousness of HBV infection among in-school adolescents should be conducted.

**Keywords:** In-school adolescents, Perception, Hepatitis B, Practices

## Plain English Summary:

Adolescents are in the age group with a tendency to engage in health behaviors that have the potential for putting them at risk of Hepatitis B Viral Infection (HBV), amongst other blood-borne infections. However, their behavior/ practices and perception which may make them vulnerable to the infection have not been explored among in-school adolescents in Ogun State.

The cross-sectional study design was adopted involving a sample of 300 In-School Adolescents (ISA) aged 11-19 years in four secondary schools in Ogun east senatorial district of Ogun State, Nigeria. Less than half (45%) of the adolescents perceived themselves to be susceptible to hepatitis B; about one-third (31%) perceived hepatitis B to be a serious disease. One hundred and seven adolescents (35.7%) perceived prevention of hepatitis as being beneficial. About three-fifths (59.7%) stated that there are barriers to the prevention of hepatitis B. The most common risky behaviors among the respondents were sharing skin-piercing instruments with their family members (79%) and friends (68.7%). The results of this study are

Correspondence:

Olaoye, Titilayo

Department of Public Health,

Babcock University, Ilishan Remo, Ogun State Nigeria

+2348033613392, [olaoyet@babcock.edu.ng](mailto:olaoyet@babcock.edu.ng)

useful for facilitating the design and development of educational interventions, aimed at promoting hepatitis B preventive behaviors among in-school adolescents.

## Introduction

Global estimates have revealed that two billion people have evidence of past or recent HBV infection with approximately 290 million people being chronically infected (1, 2). The infection is noted to be a great burden in Asia, sub-Saharan Africa, and Egypt (3). Hepatitis B infection is endemic in Nigeria. According to the Federal Ministry of Health (FMOH) report of 2016, approximately 20 million Nigerians were chronically infected with the virus; the estimated ratio of hepatitis B infection in the country was reported to be one in every eight persons (4). The report also revealed that there was no male-female predilection to the infection as both sexes were noted to be almost equally affected. Young adults were however reported to have a higher prevalence of Hepatitis B infection (4).

Adolescents can be categorized into in-school adolescents and out-of-school adolescents. In-school adolescents are young people aged 10-19 years who are attending any formal educational institution recognized by the government. They could be in a primary, secondary, or tertiary educational establishment. In-school adolescents form a large proportion of adolescents in Ogun state. Out-of-school adolescents are persons of the same age range as the in-school adolescents but are not schooling.

Chronic Hepatitis B is associated with adverse effects or complications such as liver cirrhosis, liver failure, and liver-related cancer (5). The transmission of the Hepatitis B virus is linked to contact with infected body fluids, unprotected sexual behaviors, sharing of unsterilized drug injection equipment, body tattooing, and the sharing of unsterilized skin piercing equipment (6). The engagement of adolescents in the aforementioned Hepatitis B risk-laden socio-cultural practices which have the potential for favoring the transmission of Hepatitis B infection has been reported (6, 7).

It has been noted that perception is one of the key determinants of human health behavior or practices (8). It is potentially useful for understanding the behavioral correlates associated with Hepatitis B infection. This informs the choice of the Health Belief Model (HBM) formulated by Rosenstock in 1974 to guide the formulation of this study (8). Schmidt and Middleman reported that in Texas, adolescents exhibit low levels of perceived susceptibility,

severity, and self-efficacy relating to hepatitis B and hepatitis B infection (9). Also, Gonzale *et al* reported that most young persons in the USA do not perceive themselves to be at risk of Hepatitis B infection and they engage in risky behavior (10). Chingle *et al* reported a moderately high-risk perception of Hepatitis B among University students in Jos (11). Omeje *et al* reported that adolescents in South Eastern Nigeria are vulnerable to Hepatitis B infection and in-school adolescents in Ogun State, like their counterparts in the other states of Nigeria, are vulnerable to HBV infection (6, 12). Yet the perception of the disease condition has not been well examined. Besides, the practices among the in-school adolescents in the state which may favor the occurrence of HBV infection are yet to be fully investigated.

Efforts to reduce the incidence and prevalence of Hepatitis B among adolescents are limited in Nigeria, even though an effective vaccine has been available in the country since 2004 (13). This implies that persons who were born before 2004 had no opportunity whatsoever of being vaccinated; an unquantifiable proportion of such person who has been living with the infection, therefore constitutes a reservoir of infection. Persons born after 2004 who became infected because they were not vaccinated due to one reason or the other are also potential reservoirs of infection. Infected In-school Adolescents constitute a proportion of this potential reservoir of infection. The Federal Ministry of Health of Nigeria has developed a strategic plan aimed at reducing the transmission of hepatitis virus by 50% through vaccination and the deadline set for achieving this was 2020 (14). A review of the strategic plan revealed that adolescents were not targeted for protection and children remain the main focus of the plan (14). There is no current plan for adolescents and, in Ogun state, adolescents account for 20.8% of the population (15).

To prevent and or reduce the incidence and prevalence of HBV infection among in-school adolescents in Ogun state, awareness of their perception and practices related to the disease condition which can be revealed through formative research is needed. It is this need that necessitated the design of this study to assess the perceptions and practices relating to HBV infection among adolescents in the secondary schools in Ogun State.

## Methodology

### *Study design*

The cross-sectional study design was adopted involving a sample of 300 In-School Adolescents (ISA) aged 11-19 years in four secondary schools in Ogun East Senatorial District of Ogun State, Nigeria.

### *Sample size*

The sample size was calculated using the Cochran formula for sample size determination in health studies (16)

$n = Z^2 pq / e^2$ . Where  $n$  = sample size;  $z$  = the standard normal deviation which corresponds to the 95% confidence level (1.96);  $p$  = estimated prevalence of hepatitis (18.4%). This prevalence is derived from a similar study (Ndako et al (17).  $e$  = is the desired level of precision = 0.05

$q = 1 - p$  (1 - 0.184) = 0.816;

Therefore,  $n = 1.96^2 * 0.184 * 0.816 / 0.05^2 = 3.85 * 0.150 / 0.0025 = 0.576 / 0.0025 = 230$

Where attrition rate is 10% of sample size  $10/100 * 230 = 23 + 230 = 260$ . It was rounded up to 300.

### *Sample technique*

In Ogun State secondary school education is divided into the Junior Secondary School (JSS) and the Senior Secondary School (SSS) levels. The JSS level consists of three classes namely JSS1, JSS 2, and JSS3; similarly, the SSS level consists of the following classes: SS1, SSS2, and SS3. The study participants were selected using a multi-stage sampling technique involving five stages. The purposive selection of Ogun East Senatorial District out of the three senatorial districts was the first step. The senatorial district was purposively selected because it accounts for 45% of the Local Government Area (LGAs) in the State (18). In the second step, four LGAs representing 40% of the LGAs in the senatorial zone were selected through simple random sampling (balloting) (18). This exercise resulted in the selection of Odogbolu, Sagamu, Ijebu-Ode, and Remo North. The third step was the selection of one school by simple random sampling (balloting) from each of the LGA. The number of participants recruited in each school was then determined through a proportionate sample technique resulting in a sample of 80 selected in Adeola Odutola secondary school Ijebu-Ode, 74 in Remo secondary school Sagamu, 74 in Odogbolu Grammar school Odogbolu, and 72 in Iyakan secondary school Isara. In each of the selected schools, there were seven arms in each class. One arm of a class was then randomly

selected by simple random sampling (balloting) from each of the following classes in a school - JSS3, SS1, SS2, SS3 this constituted the fourth step. In the fifth step, a minimum of 18 students were selected through systematic random sampling from the selected arms of a class using the class register as a sampling frame.

### *Instrumentation*

A validated self-administered semi-structured questionnaire which was developed by the researchers from existing literature was used for data collection. The instrument had three sections. Section A focused on participants' socio-demographic characteristics such as age, sex, date of birth, religion, and class. Section B contained questions on practices that have implications for HBV infection such as screening for HBV, vaccination for HBV, tattooing, sexual intercourse with multiple sexual partners, involvement in unprotected sex, and the sharing of skin piercing instruments. The perception assessed included questions related to the following: perceived susceptibility measured on a 12-point perception scale; perceived severity determined on a 9-point scale; perceived benefits assessed on a 7-point scale and perceived barrier determined on a 7-point scale. Scores that were lower than the mean score were considered low, while scores greater than and equal to the mean score were considered high. The perception questions attracted a maximum of a 35-point perception scale. The perception responses which were in line with the biomedical view were operationally defined as favorable while those not in line with the biomedical view were defined as unfavorable. A favorable perception was scored 1 while unfavorable perception attracted no score (Zero). A response of no opinion was also scored zero (0). The maximum expected score was 35. Participants who scored  $\leq 17.5$  that is below the 50% of the expected score were regarded as having unfavorable perception, while those who scored  $> 17.5$  that is above 50% of the expected score were classified as those having favorable perception.

### *Data analysis*

Data analysis was done using the IBM Statistical Package for Social Science (SPSS) version 23. Quantitative variables were described using mean and standard deviation and are summarized in tables. Chi-square was used to test the association between categorical

variables and risky practices among the respondents at  $p < 0.05$  level of significance.

The mean age of the participants was  $14.3 \pm 1.7$  years and over half (55.3%) were aged 10-14 years. Slightly more than half (51.7%) were females and slightly over a quarter (26.6%) were in JSS3 class (Table 1).

**Results**

*Socio-demographic Information*

**Table 1 Socio-demographic Characteristics of the Respondents**

| Socio-demographic variables | Frequency(n=300) | Percentage (%) |
|-----------------------------|------------------|----------------|
| Age (in years)              |                  |                |
| 10-14                       | 166              | 55.3           |
| 15-19                       | 134              | 44.7           |
| $\bar{x}$ 14.31 $\pm$ 1.73  |                  |                |
| Sex                         |                  |                |
| Male                        | 145              | 48.3           |
| Female                      | 155              | 51.7           |
| Class                       |                  |                |
| JSS 3                       | 80               | 26.6           |
| SS 1                        | 72               | 24.0           |
| SS 2                        | 74               | 24.7           |
| SS 3                        | 74               | 24.7           |

*Perception of Hepatitis B Infection*

Table 2 shows that all the participants perceived themselves to be vulnerable to Hepatitis B infection but the levels of vulnerability varied, with more than half (55%) perceiving themselves to have low susceptibility to hepatitis B infection while 45% of the adolescents perceived themselves to be highly susceptible to the infection. Less than a third (31%) of the adolescents perceived hepatitis B infection to be

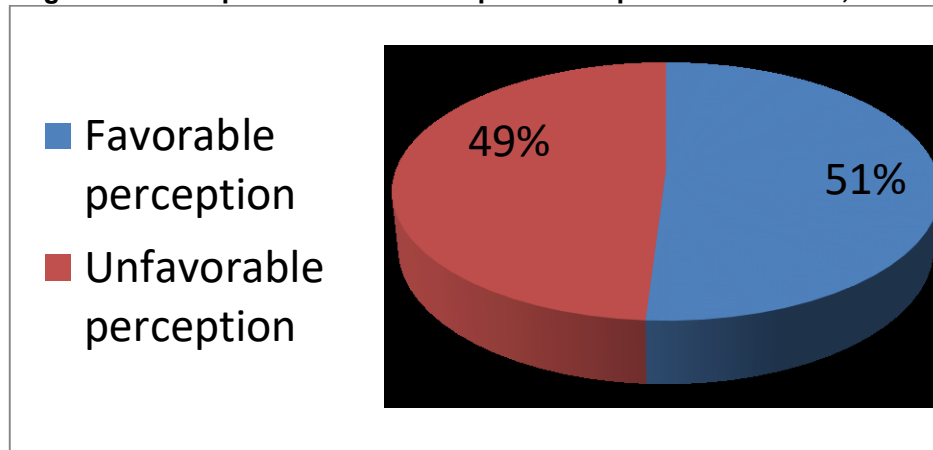
a serious disease. About one-third (35.7%) of the adolescents perceived hepatitis B prevention as being highly beneficial, while the majority (64.3%) did not. More than half (59.7%) stated that their levels of barriers to the prevention of hepatitis B were high. Some of the barriers stated by the participants were lack of knowledge of hepatitis B infection, lack of time, and the cost of the vaccine and screening for HBV.

**Table 2: Descriptive Statistics relating to Participants level of Perception**

| Perception and Maximum scores in points   | Proportion (%) (n=300)          |
|---|---------------------------------|
| <b>Level of Perceived susceptibility on a 12-point scale:</b>                     |                                 |
| High level of susceptibility (0 to 6)   | 135(45.0)                       |
| Low level of susceptibility(7 to 12)  | 165(55.0)                       |
| Mean perceived susceptibility score   | <b>6.05<math>\pm</math>2.1</b>  |
| <b>Level of Perceived seriousness on a 9-point scale:</b>                         |                                 |
| High level of seriousness(0 to4.5)  | 93(31.0)                        |
| Low level of seriousness (4.6 to9.0)  | 207(69.0)                       |
| Mean perceived seriousness score  | <b>3.68<math>\pm</math>1.71</b> |
| <b>Level of Perception of the benefit of prevention on a 7-point scale:</b>       |                                 |
| High level of associated perceived benefits(0 to 3.5)                             | 107(35.7)                       |
| Low level of associated perceived benefits(3.6 to 7.0)                            | 193(64.3)                       |
| Mean perceived benefit score  | <b>4.49<math>\pm</math>1.73</b> |
| <b>Level of Perception relating to barriers to prevention on a 7-point scale:</b> |                                 |
| High level of barriers (0 to 3.5)   | 179(59.7)                       |
| Low level of barriers (3.6 to 7.0)  | 121(40.3)                       |
| Mean perceived barrier score  | <b>2.92<math>\pm</math>1.67</b> |

Overall, the proportion of participants with favorable perception was 49% (Figure 1).

**Figure 1: Participants' Overall Perception of Hepatitis B Infection, N = 300**



The relationship between participants' socio-demographic characteristics and their perception of hepatitis B infection is presented in table 3. It was noted that there was no significant

relationship between participants' age ( $X^2=0.25$ ;  $p=0.25$ ); sex ( $X^2=1.95$ ;  $p=0.10$ ); and class ( $X^2=3.90$ ;  $p=0.27$ ) and their perception of HBV infection.

**Table 3 Participants' Perception of Hepatitis B by socio-demographic characteristics**

| Attribute    | Unfavorable perception<br>n=147 (%) | Favorable perception<br>n=153 (%) | Total<br>N=300 | p-value | $X^2$ |
|--------------|-------------------------------------|-----------------------------------|----------------|---------|-------|
| <b>Age</b>   |                                     |                                   |                |         |       |
| 10-14        | 78(53.1)                            | 88(57.5)                          | 166(55.3)      | 0.25    | 0.60  |
| 15-19        | 69(46.9)                            | 65(42.5)                          | 134(44.7)      |         |       |
| <b>Sex</b>   |                                     |                                   |                |         |       |
| Male         | 65(44.2)                            | 73(47.7)                          | 145(48.3)      | 0.10    | 1.95  |
| Female       | 82(55.8)                            | 80(52.3)                          | 155(51.7)      |         |       |
| <b>Class</b> |                                     |                                   |                |         |       |
| JSS 3        | 44(29.9)                            | 36(23.5)                          | 80(26.6)       | 0.27    | 3.90  |
| SS1          | 31(21.1)                            | 41(26.8)                          | 72(24.0)       |         |       |
| SS2          | 32(21.8)                            | 42(27.5)                          | 74(24.7)       |         |       |
| SS3          | 40(27.2)                            | 34(22.2)                          | 74(24.7)       |         |       |

**Adolescents' risky practices**

The risky practices relating to viral hepatitis B among the participants are highlighted in table 4. There is a significant association between sex (gender) and risky practices such as the practices of unsafe sex, having multiple sexual partners, and sharing skin-piercing instruments ( $p=0.10$ ;  $p=0.02$ ;  $p=0.01$  respectively). Amongst the male participants, 16(11%) had ever screened for HBV while the majority (89%) did not. A similar finding can be observed amongst the females as well with only 8(5.2%) reporting to had ever screened for HBV. Only 14(9.7%) male participants reported having received HBV vaccine, compared with those that did not. A similar finding

can be found amongst females as well, with the majority (96.1%) admitting not to have been vaccinated. Few 23(15.9%) males and 8(5.2%) females had ever had sex ( $p=0.002$ ). Of those who had ever had sex 9(39.1%) males and 4(50%), females practiced safe sex ( $p=0.10$ ). Also of those who ever had sex, 11(47.8%) males and 4(50%) females had multiple sexual partners ( $p=0.02$ ). Amongst the male participants, a higher number (81.4%) of them shared skin-piercing instruments with family, compared with those that did not. A similar finding can be found amongst the females as well, with the majority (76.8%) admitting sharing sharps with family.

**Table 4 Hepatitis B related Practices among the Adolescents Differentiated by Sex**

| <b>Risky Practices</b>  | <b>Males<br/>n=145<br/>n (%)</b> | <b>Females<br/>n=155<br/>n (%)</b> | <b>Total<br/>N=300<br/>n(%)</b> | <b>p-value</b> | <b>X<sup>2</sup></b> |
|---|----------------------------------|------------------------------------|---------------------------------|----------------|----------------------|
| <b>Ever Screened for hepatitis B</b>  |                                  |                                    |                                 |                |                      |
| Yes   | 16(11.0)                         | 8(5.2)                             | 24 (8.0)                        | 0.04*          | 3.51                 |
| No  | 129(89.0)                        | 147(94.8)                          | 276(92.0)                       |                |                      |
| <b>Vaccinated for Hepatitis B</b>   |                                  |                                    |                                 |                |                      |
| Yes   | 14(9.7)                          | 6(3.9)                             | 20(6.7)                         | 0.03*          | 4.03                 |
| No  | 131(90.3)                        | 149(96.1)                          | 280(93.3)                       |                |                      |
| <b>Ever had Sex</b>   |                                  |                                    |                                 |                |                      |
| <b>Yes</b>  | 23(15.9)                         | 8(5.2)                             | 31(10.3)                        | 0.002*         | 9.26                 |
| <b>No</b>   | 122(84.1)                        | 147(94.8)                          | 269(89.7)                       |                |                      |
| <b>Sex with condom n=31</b>   |                                  |                                    |                                 |                |                      |
| Yes   | 9(39.1)                          | 4(50.0)                            | 13(41.9)                        | 0.10*          | 9.11                 |
| No  | 14(60.9)                         | 4(50.0)                            | 18(58.1)                        |                |                      |
| <b>Multiple sex partner n=31</b>  |                                  |                                    |                                 |                |                      |
| Yes   | 11(47.8)                         | 4(50.0)                            | 15(48.4)                        | 0.02*          | 12.08                |
| No  | 12(52.2)                         | 4(50.0)                            | 16(51.6)                        |                |                      |
| <b>Shared skin-piercing instrument with family (blade, nail cutter, injection,)</b>     |                                  |                                    |                                 |                |                      |
| Yes   | 118(81.4)                        | 119(76.8)                          | 237(79.0)                       | 0.20           | 0.32                 |
| No  | 27(18.6)                         | 36(23.2)                           | 63(21.0)                        |                |                      |
| <b>Shared skin-piercing instrument with friends (blade, nail cutter, and injection)</b> |                                  |                                    |                                 |                |                      |
| Yes   | 109(75.2)                        | 97(62.6)                           | 206(68.7)                       | 0.01*          | 5.52                 |
| No  | 36(24.8)                         | 58(37.4)                           | 94(31.3)                        |                |                      |
| <b>Tattooing</b>  |                                  |                                    |                                 |                |                      |
| Yes   | 8(5.5)                           | 3(1.9)                             | 11(3.7)                         | 0.08           | 2.72                 |
| No  | 137(94.5)                        | 152(98.1)                          | 289(96.3)                       |                |                      |

\*Significant at &lt;0.05

### Discussion

The study was designed to examine the perception and practices relating to Hepatitis B Infection among in-school adolescents in secondary schools in Ogun State, Nigeria. All the participants perceived themselves to be vulnerable to hepatitis B infection. However, the level of vulnerability to infection varied from low to high among them. This finding was higher than the findings of Yazdani et al and Azam et al (19, 20). The difference between the perceived vulnerability to infection recorded in our study in Nigeria and that of Yazdani et al in Iran may be due to differences between the two populations. A similar factor may have accounted for the differences in the level of perception in the study of Azam et al. The mean perceived susceptibility score in this study was 6.05±2.1 out of a possible 12. This finding is consistent with the results of Nasirzadeh et al that showed that the mean score of personal perceived risk was 6.51 ± 1.97 out of a possible score of 10 (21).

This study reveals that the majority of the participants had a low level of perception of the seriousness of the disease. Low perceived seriousness is an important barrier to the prevention of HBV. When adolescents' perception of seriousness is low, they are not likely to take sustained precautionary measures against it. Hepatitis B infection is a very serious disease. This perception could be due to poor knowledge of adverse health effects of the disease such as liver cancer. The factor that may have led to this is that the disease has not been given much attention on the local, state, and national level in Nigeria as compared with HIV/AIDS which has a similar mode of transmission. One way of increasing in-school adolescents' level of awareness of the severity of the disease is to have health workers share their experiences of patients with them in terms of how the disease has adversely affected their quality of life and the resultant mortality that it can lead to ultimately.

This is supported by the Health Belief Model that the probability of acting by an individual for his health depends on his understanding of the susceptibility and severity of the disease as well as, his perceived benefits on the prevention of the disease against his perceived barriers.

The most common risky practices/behaviors noted in this study were the sharing of skin piercing instruments with family members and friends. Omeje et al made a similar observation in southeastern Nigeria (6). The similarity in the result may be because both studies were conducted in Nigeria and they had similar practices that can put people at risk of HBV infection. To minimize the identified risky behaviors among adolescents, health education programs concerning the mode of transmission and prevention of viral hepatitis should be conducted. This can be promoted through print, electronic and social media education targeting adolescents in schools, youth centers, and clubs. This study revealed that favorable and unfavorable perceptions cut across all the age groups, as they all had a similar view of hepatitis B infection. This finding is at variance with the findings of Gonzales et al that perception of the risk of hepatitis B infection significantly differing by age and older respondents were more likely to perceive greater risk for themselves (10).

In this study both males and females reported practicing unsafe sex, having multiple sexual partners, and sharing skin-piercing instruments with friends. This practice was common among males than females. Also, the prevalence of vaccination against Hepatitis B in this population was low. This is in line with the findings of Nanbur et al in Plateau Nigeria; these investigators reported a low prevalence of Hepatitis B among their study population, also they reported that males were more likely to be exposed to certain risk behaviors, such as multiple sexual partners, sharing skin-piercing items and having unsafe sexual intercourse (22). All these behaviors increased the risk of HBV infection. Needle sharing has long been identified as a major risk factor for the transmission of HBV (23). Hepatitis B virus can survive outside the body for at least seven days, and, during this period, sharing contaminated razor blades, toothbrushes, and nail cutters are potential significant behavioral risk factors in transmitting HBV among household members (24).

#### **Limitation of the study**

Respondents may have been biased in giving responses to some items (such as prevention

practices) since the data retrieved was based on self-reported information. Further studies can be conducted among out-of-school adolescents to determine their perception and prevention practices since they were not part of the study population.

#### **Conclusion**

The perception and practices among in-school adolescents have the potential for putting them at risk of HBV infection. It is recommended that conducting educational interventions, aimed at promoting Hepatitis B virus preventive behaviors and increasing the level of perception of vulnerability and seriousness of HBV infection among in-school adolescents will be beneficial to reduce the prevalence of Hepatitis B infection and promote their preventive practices. Also, an enlightenment campaign about the risk factors associated with Hepatitis B infection should be launched in schools.

#### **List of Abbreviations**

FMOH: Federal Ministry of Health  
HBM: Health Belief Model  
HBV: Hepatitis B Virus  
ISA: In-school Adolescents  
JSS: Junior Secondary School  
LGA: Local Government Area  
SPSS: IBM Statistical Package for Social Science  
SSS: Senior Secondary School

#### **Declarations**

##### *Ethical approval and consent to participate*

Ethical approval for this study was obtained from the Babcock University Health Research and Ethics Committee with reference number NHREC 24/01/2020. Written and Signed informed consent was obtained from all the parents of the participants involved in the study. Also, assent was obtained from participants aged <18years. Informed consent was also obtained from participants aged ≥18years.

##### *Consent for publication*

The authors hereby give consent for the publication of our work under the creative commons CC Attribution-Non-commercial 4.0 license.

##### *Availability of data and materials*

The datasets used and/or analyzed in this study are available from the corresponding author on reasonable request. All data generated or

analyzed in this study are available upon reasonable request to the corresponding author.

#### Competing Interests

There is no competing interest.

#### Funding

The research was funded by researchers.

#### Authors' contributions

OT formulated the title, collected data, did the data analysis, and prepared the manuscript. ACO reviewed the literature and collected the data. OFO prepared and edit the manuscripts.

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