Effects of Disease Education on Knowledge and Attitudes of Hepatitis B among In-School Adolescents with Hearing Impairment in Oyo State, Nigeria

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ABSTRACT

Background: Knowledge and attitude are critical in controlling hepatitis B in all populations, including in-school adolescents with hearing impairment who have inadequate access to health information. Hepatitis B is one of the many public health problems in Nigeria, and in particular for adolescents with hearing loss who are also affected by the barriers in access to health information. Literature have shown a low level of knowledge and attitude towards hepatitis B in Nigeria, including Oyo State. Previous studies on knowledge and attitude towards hepatitis B focused largely on causative factors, with little attention paid to intervention using Disease Education (DE). This study analysed the impact of the disease education intervention on knowledge and attitude toward Hepatitis B among in-school adolescents in Oyo State, Nigeria

Method: A pretest–posttest control group quasi-experimental design was used. A total of 123 participants comprised the experimental (n = 78) and control (n = 45) groups. The data collection for this study included the use of validated instruments, including the Knowledge of Hepatitis B Test (r = 0.79), the Attitude toward Hepatitis B scale (r = 0.71) and intervention manual. The intervention lasted for 8 weeks. Data were analysed using descriptive statistics and analysis of covariance at the 0.05 level of significance.

Result: The 123 participants comprised 65.9% females with a mean age of 18.23± 1.34 years. It was found that there was a statistically significant main effect of treatment on KHB ($F_{(1,115)} = 1205.23$, partial $\eta^2 = 0.91$). Participants in DE ($\bar{x} = 31.74$) were significantly better than those in the control ($\bar{x} = 20.40$) group. It was also found that there was a statistically significant main effect of treatment on AtHB ($F_{(1,115)} = 2856.05$, partial $\eta^2 = 0.96$). Participants in DE ($\bar{x} = 40.57$) had a more positive attitude than those in the control ($\bar{x} = 28.90$) group.

Conclusion: The study concludes that while the disease education intervention significantly improved knowledge and attitudes, Inclusive health education interventions are therefore effective across both male and female adolescents with hearing impairment.

Keywords: Hepatitis B, Knowledge, Attitude, Disease Education

INTRODUCTION

The well-being of the population in developing countries, including people with hearing impairments, is under a dire threat due to the presence of the diseases that could be prevented by spreading knowledge, altering

attitudes, and by adopting healthy behaviours. One such disease is hepatitis B that can cause a considerable amount of harm to one of the most important organs. The organism poses a significant health concern to the population since it is highly transmittable and mostly affects the hepatic tissue. Hepatitis B in Nigeria is hyperendemic with horizontal modes of transmission as the major mode of transmission across various demographic groups of people especially the adolescents that have adopted some emerging behaviours including unsterilised piercings, sharing of sharp objects and risky sexual behaviours that expose them to more vulnerability to infection. Adolescent hearing impaired people in schools also face a communication barrier compared to their hearing counterparts, and they often use mostly the sign language; therefore, they cannot have access to the much-needed health information because traditional health education is mostly provided through auditory means. This communication barrier limits their ability to make informed health choices in addition to assuming preventive behaviours that might protect them against hepatitis B infection.

Hepatitis B is a major, global, population health issue, and this is evident in terms of prevalence rate, infectivity, morbidity as well as mortality. Its etiological agent is a DNA virus of family Hepadnaviridae, which is directed at hepatic cells primarily. The pathways of contagion of hepatitis B are like the Human Immunodeficiency Virus (HIV), only that the virus is far more resilient, and is slightly fifty to one hundred times more infective than HIV. It is possible that the virus can cause infection in a new host at least seven days after exiting the human host (WHO, 2022). Most of the causes of infection include contact with infectious blood or body fluids, including unprotected sex, infected needles or syringes, blood transfusion, and mother-to-child infection in the perinatal stage (Papastergiou, *et al.,* 2015). Mother-to-child infection is a severe health problem of the population the percentage of such a health problem is between 70-80% among the HBsAg-positive women, yet timely interventions can significantly decrease the risks (Karaca and Karaca, 2018). The other routes include unprotected injections, sharps contact, and body tattooing, body-piercing, and sharing razor tools (WHO, 2023). The results prompt the necessity to develop special education that will address in-school adolescents with hearing impairments that may lead to risky behaviours, including early sex, tobacco and alcohol use, and re-infecting of unsterilised needles can significantly contribute to the burden of diseases in the world (Bahy, 2015). Hepatitis B provokes the hepatic inflammation that can either be treated or may get chronic complications that comprise cirrhosis, fibrosis, and hepatocellular carcinoma.

The World Health Organisation reports that Nigeria is among the main causes of the global outbreak of severe infectious hepatitis and hepatitis B in particular, which is very crucial due to the overall ignorance (WHO, 2018). The lack of effectiveness of comprehensive programmes of hepatitis prevention and management has been limited thus increasing the rate of infections in Sub-Saharan Africa. One of the barriers is that a significant population of the population is asymptomatic within a period of 30 years and is only diagnosed with chronic liver cirrhosis disease at an advanced stage (Eni *et al*., 2019).

Though effective hepatitis B vaccines have always existed since 1982, the population who succumb to the illness has been on the rise among the communicative population as well as the hearing impaired. The current endemics of chronic hepatitis B in Nigeria can be linked to lack of sufficient vaccinations among population and high inequality in the general knowledge particularly that of the hearing impaired population who is not accustomed to the hepatitis B knowledge being forced upon them through the conventional sound tracks. Oyasope, *et al.,* (2024) confirmed that even though the hepatitis B vaccine is included in the National Programme on Immunisation (NPI), the vaccination exercise is still wanting, especially among the people who use sign language and any other possible available tools in the realisation of the full potential of the medical awareness programme. As the adolescents are prone to experimenting and taking risks, facilitated and prepared access to hepatitis B education will play a key role in providing the adolescents with the knowledge, attitudes and behaviours required to alleviate the susceptibility to infections.

The most repeated finding is that the teenagers including the hearing impaired have poor and incomplete health knowledge, which is one of the largest contributors to the high-risk behaviours. Pache, *et al.,* (2015) have found that the awareness on hepatitis B among the deaf in Brazil was very low. Xue *et al*. (2017) connected the probability of high-risk behaviours among deaf and hard-of-hearing individuals in the US with the lack of

knowledge. Information incomplete limited the capacity of the students to shun the risky behaviours and preventionary precaution measures such as vaccination as precautionary stance.

Poor awareness on the spread of hepatitis B appears to have an impact on the sexual behaviour and other risky behaviours among adolescents with hearing impairment. This was affirmed by Isaiah and Ola (2016) who observed that a large number of adolescents who are deaf engage in sexual activities such as sexual behaviours that lead to sexual activities motivated by financial benefits. The findings indicated that 35 per cent of the sample of the students were sexually active with different reasons, 17 per cent of the students had procured an abortion due to a sexual partner, 28 per cent of the students had experienced rape, high prevalence of STIs by 9 per cent and 16 per cent respectively. These statistics emphasise the fact that in this group, the risk of hepatitis B is high. Okonkwo, *et al.,* (2019) hypothesised to raise the extent of awareness and knowledge of hepatitis B and positive attitudes, which can result into a positive change in health-seeking behaviour and reduce the rate of infections among in-school adolescents with hearing impairments.

Changing of attitudes is a very important role that could influence health promoting behaviours to prevent infections as well as the promotion of healthy lifestyle behaviours because knowledge acquisition of hepatitis B in in-school adolescents with hearing impairment plays very important roles. Such attitudes are necessary to be known so that people can promote the positive behaviour changes and achieve better health results as the bad attitudes can lead to the development of the negative ones (Fava, *et al*, 2022). The knowledge-based attitude to hepatitis B prevention is the key to the spread decrease; thus, the strategy to the disease management consists of the complex of knowledge-based attitudes change. Furthermore, individuals with hearing impairments may develop an additional degree of stigma and discrimination regarding hepatitis B, which can also augment the feeling of isolation and undermine them to seek the necessary treatment (Iezzoni, 2022). The misconceptions about transmission and treatment also might deprive people of preventive measures and to disclose their health status (Ferguson, 2018).

In-school adolescents with hearing impairments are frequently marginalised from standard health education initiatives owing to the dominance of auditory-based communication methods, such as spoken classroom instruction, radio broadcasts, and verbal community awareness campaigns. These methods limit their understanding of hepatitis B propagation, preventive measures, and vaccination. The scarcity of visual language interpreting with adequate medical knowledge intensifies misinformation, inadequate medical literacy, and diminished participation in prevention health services.

Data from Oyo State indicates substantial deficiencies in adolescents' awareness and preventive measures concerning hepatitis B. Research conducted in Ibadan indicated that merely 13.7% of youths possessed adequate knowledge of the disease, whereas findings from Ogbomosho revealed that, although some adolescents identified transmission pathways, awareness of vaccination remained markedly limited (Oyasope, *et al.*, 2024). Although hepatitis B vaccination efforts have been expanded, Hepatitis B contamination remains a substantial community disease concern in Nigeria and Oyo State. Seroprevalence studies conducted in Oyo State have documented persistent HBsAg positivity among clinic attendees (Olayiwola and Lanlehin, 2021) and among fully vaccinated children (Akomolafe *et al*., 2024), whereas national data indicate a prevalence of approximately 5.4% within the general population (Olakunde *et al*., 2025). These findings indicate ongoing deficiencies in prevention awareness and safeguarding, which are probably more significant among adolescents with hearing impairments.

Moreover, being stigmatised with the hearing impairment and the status of having hepatitis B makes it hard to access healthcare services and participate in preventive programmes. Although, there has been much done concerning the issue of hepatitis B in Nigeria, there is scant little empirical evidence regarding the adolescents with hearing impairment and this is a huge vacuum in the existing literature. Based on these issues, it is necessary to develop interventions of inclusive and specific disease-education promotion and prevention with the intention of enhancing the level of knowledge, eliciting positive attitudes, and decreasing risk-related behaviours in terms of hepatitis B among adolescents with hearing impairments. The present paper assessed how

disease-education intervention would impact on knowledge, attitudes and risk-related behaviours of hepatitis B among hearing-impaired adolescents living in Oyo state, Nigeria.

Hypotheses

1. There will be no significant main effect of the disease education intervention on Hepatitis B knowledge among adolescents with hearing impairment in Oyo State.
2. There will be no significant main effect of the disease education intervention on attitudes toward Hepatitis B among adolescents with hearing impairment in Oyo State.

METHODOLOGY

This study utilised a pretest-posttest control group quasi-experimental design. This approach was deemed appropriate because it allowed the experimental group to receive the intervention while measuring the dependent variables knowledge and attitude towards Hepatitis B both before and after the intervention. The population of the study comprised all in-school Adolescents with hearing impairment in Oyo State. 123 adolescents with hearing impairments who were enrolled in school made up the study sample. This study utilised three primary instruments: a self-developed training manual on disease education, a self-developed questionnaire and audiometric screening machine. The training manual served as the intervention guide for the experimental group, outlining the procedures for the educational programme.

To assess the effect of the intervention on participants' knowledge and attitudes towards Hepatitis B, the researchers designed and employed a self-developed questionnaire with three major sections (A–C) of the instrument, each of which addressed specific dimensions of the study variables. Section A: Demographic Information of the participants Section B: Knowledge of Hepatitis B Scale (KHBS to assess participants' factual knowledge of Hepatitis B. Section C: Attitude towards Hepatitis B Scale (AHBS) aimed at evaluating participants' attitudes toward Hepatitis B and related preventive practices. A pilot study was conducted with 20 in-school adolescents with hearing impairments from the Secondary School for Persons with Special Needs in Osogbo, Osun State, to assess the reliability and internal consistency of the research instrument. Cronbach's Alpha (α) was calculated to determine the internal consistency of the three Hepatitis B-related scales: Knowledge of Hepatitis B Scale (KHBS): $\alpha = 0.79$ and Attitude towards Hepatitis B Scale (ATHBS): $\alpha = 0.71$. The hypotheses were tested by using inferential statistics, specifically Analysis of Covariance (ANCOVA), at 0.05 level of significance.

RESULTS

Ho1: There will be no significant main effect of treatment on knowledge of Hepatitis B among in-school adolescents with hearing impairment in Oyo state, Nigeria

S/N	Item	True	False
1	Hepatitis B is caused by a virus.		
2	Hepatitis B affects liver function.		
3	People of all ages can be infected with Hepatitis B.		
4	Hepatitis B can be transmitted from person to person.		
5	Hepatitis B can be treated or managed.		
6	A person with Hepatitis B may appear healthy and feel well.		
7	There is a test to determine if someone has Hepatitis B.		
8	Sharing personal items like razors, scissors, or toothbrushes can transmit Hepatitis B.		
9	The Hepatitis B vaccine is safe and effective.		

Summary of results demonstrating the pretest-posttest effects of treatment, gender, and onset of impairment on knowledge and attitude Hepatitis B among in-school adolescents with hearing impairment in Oyo state, Nigeria.

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Knowledge	3798.351[a]	2	1899.1755	704.44196	.000	.925
	Attitudes	3954.398[b]	2	1977.199	469.294	.000	.966
Intercept	Knowledge	68608.797	1	68608.797	25450.737	.000	.996
	Attitude	121834.471	1	121834.471	101212.291	.000	.999
Treatment	Knowledge	3248.993	1	3248.993	1205.228	.000	.913
	Attitude	3437.977	1	3437.977	2856.052	.000	.961
Error	Knowledge	310.011	120	2.696			
	Attitude	138.431	120	1.204			
Total	Knowledge	96835.840	123				
	Attitude	164366.000	123				
Corrected Total	Knowledge	4108.362	122				
	Attitude	4092.829	122				

According to the table above, treatment has a statistically significant main effect on the knowledge level of Hepatitis B among in-school adolescents with hearing impairment in Oyo State, Nigeria $F_{(1,115)} = 1205.228$, p <.05, 913. Therefore, the null hypothesis (Ho1) was discarded. The result of this indicates that the treatment had a significant difference in scores of knowledge among the participants. This effect size (η 2 =.913) indicates that it is estimated that 91.3 of the variance in Hepatitis B knowledge can be due to the treatment status, indicating a very large practical effect. The results align with the study carried out by Usita, et al., (2021) who found out that health education intervention played an important role in helping to improve the knowledge and awareness of the secondary school students with regard to sickle cell anaemia. Also, A quasi-experimental study by Abiola, *et al.,* (2012) revealed high efficacy of a knowledge-based health education intervention on the knowledge of rural secondary school students in the Sokoto State on the perceptions and individual hygiene practices.

Adjusted Marginal Mean showing the direction of difference in knowledge of Hepatitis B between the treatment groups

The table above demonstrates that participants assigned to the experimental group obtained a higher mean score

Dependent Variable	Treatment	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Knowledge of Hepatitis B	Experimental group	31.741	.210	31.326	32.156
	Control group	20.395	.251	19.899	20.892

($\bar{x}$ = 31.741) than their counterparts in the control group ($\bar{x}$ = 20.395). This difference in mean scores indicates that individuals exposed to the intervention possessed a greater level of knowledge regarding Hepatitis B than those who did not receive the treatment.

Ho 2: There is no significant main effect of treatment on attitude towards hepatitis B among in-school adolescents with hearing impairment in Oyo state, Nigeria

S/N	ITEMS	SA	A	D	SD
1	Hepatitis B screening is a waste of time				
2	Hepatitis B is a punishment from the enemy				
3.	Hepatitis B can only affect old people				
4.	Hepatitis B management is prohibitively costly and ultimately unjustifiable.				
5	I am amenable to receiving the HBV vaccine at no cost.				
6	The possibility of contracting Hepatitis B is slim since I am engaging in physical activities				
7	Hepatitis B vaccination is not necessary at my age.				
8.	It is not healthy to live with an infected person				

The table above reveals a statistically significant main effect of treatment on attitudes toward Hepatitis B among in-school adolescents with hearing impairment in Oyo State, Nigeria, $F_{(1,115)}$=2856, p<...05, η^2=.961. Accordingly, the null hypothesis was rejected. This result indicates that the treatment produced a significant difference in participants' attitude scores. The reported effect size (η^2 = .961) suggests that approximately 96.1% of the variance in attitudes toward Hepatitis B is explained by the treatment condition, representing an exceptionally large magnitude of effect. The findings was corroborated by Sareetha et al.,2018 that the structure educational intervention led to a statistically significant increase in attitude scores towards hepatitis B vaccination and prevention also study be Kamar et al., 2024 reported a 38% increase in attitude of students in India towards hepatitis B after the educational intervention, showing a clear positive shift in students' perception of the disease.

Adjusted Marginal Mean showing the direction of difference in attitude towards Hepatitis B between the treatment groups

Dependent Variable	Treatment	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Attitude towards Hepatitis B	Experimental group	40.574	.140	40.296	40.851
	Control group	28.903	.168	28.571	29.235

The table above demonstrates that participants assigned to the experimental group attained a higher mean attitude score ($\bar{x}$ = 40.574) than their counterparts in the control group ($\bar{x}$ = 20.903). This difference indicates that exposure to the treatment was associated with more favourable attitudes toward Hepatitis B among adolescents in the experimental condition relative to those who did not receive the intervention.

CONCLUSION AND RECOMMENDATIONS

This study has revealed that properly designed and available disease education initiative can play a major role in enhancing the knowledge, attitudes and preventive practices according to hepatitis B among in-school adolescents with hearing impairment in Oyo State, Nigeria. The intervention succeeded in attaining critical gaps in health education among this most vulnerable population and promoting understanding as well as inclusion through the incorporation of culturally relevant strategies, visual aids, and sign language.

The following recommendations are given in relation to the findings of the study.

1. It is crucial to include the Hepatitis B education in the health curriculum of schools that specialise in educating students with hearing impairment. This education should be formally integrated into the Ministry of Education and the school administrators because it has shown improvement in knowledge, attitudes and reduction in at-risk behaviours that can account up to 97% of the variance.
2. A Sign-Language Friendly Health Education Resources should be created since adolescents with hearing impairment had spent substantial benefits in structured disease education, government agencies and non-governmental organisations ought to create visual, sign-language based and cultural appropriate hepatitis b instructional resources to guarantee persistent learning and understanding.
3. Train Teachers and Health Educators on Inclusive Health Communication: Teachers and school health officers are expected to be trained on the provision of health education through the application of inclusive health communication methods including the Nigerian Sign Language, visual teaching demonstrations, and the interactive teaching aids. This is necessary since treatment emerged as the leading predictor of change as opposed to gender and development of impairment.
4. Improve School Health programmes by way of Routine screening and vaccination: Routine screening and routine vaccination programmes should be considered by schools and routine health counselling sessions taken after because of the improved results of the intervention. The communication needs of the learners with hearing impairments should be met by exercising the services.

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