

Awareness of Hepatitis among Pregnant Women in Akoko South-West Local Government Area, Ondo State, Nigeria

ADEDUGBE, Benjamin Oluwale¹

Benjamin.adedugbe@aaau.edu.ng,
08033190862

OSENI, Ahmed Olamide¹

ahmedolamideoseni@gmail.com,
07041029242

MATINHOUNKPON, Grace Sewe¹

matinhounkponsewe@gmail.com
09054826960

¹Department of Human Kinetics and Health Education Adekunle Ajasin University, Akungba-Akoko.

Abstract

This study investigated Awareness of Hepatitis among Pregnant women in Akoko South-west Local Government area, Ondo State, Nigeria. Descriptive survey research design was used. The study population comprised all pregnant women attending antenatal in Akoko-South West Local Government Area of Ondo State. Multistage sampling procedure was adopted for the study. The research instrument used for the study was a self-structured questionnaire titled Awareness of Hepatitis among pregnant women. The reliability of the instrument was measured using the test-re-test method and resultant value of 0.70 was obtained. Descriptive statistics was used to answer the research questions while inferential statistics was used to test the hypotheses at 0.05 alpha level. The findings of the study revealed that; level of knowledge of Hepatitis is low among pregnant women ($\bar{x}$ = 2.35); also, age (F = 6.086), and religion (F = 4.019) showed significant difference on the knowledge of Hepatitis among Pregnant women attending antenatal in Akoko-South West Local Government Area of Ondo State. Based on the findings, it was concluded that level of knowledge of hepatitis virus among pregnant women attending health care clinic in Akoko southwest is low. It was therefore recommended that Maternal knowledge is very important in the prevention of hepatitis B virus which could be done through government partnership with various health centers to organize symposia on Hepatitis.

Keywords: Knowledge, hepatitis, pregnant women, age, religion

Introduction

Hepatitis is an inflammation of the liver that is caused by a variety of infectious viruses and noninfectious agents leading to a range of health problems, some of which can be fatal. Viral hepatitis is caused by a diverse collection of viruses with differing structural biology, transmission, endemic patterns, and chronicity that share a common propensity to infect and replicate in human hepatocytes. These are referred to as hepatotropic viruses, and cause most hepatitis in the pregnant and non-pregnant populations. Viruses included in this group are Hepatitis viruses A, B, C, and E (HAV, HBV, HCV, and HEV). Others include Hepatitis D (HDV) and Hepatitis G (HGV), which also pose risks of perinatal infections and transmission. World Health Organization [WHO], (2019), estimates that in 2019, 296 million people worldwide are living with hepatitis B, 58 million people worldwide are living with hepatitis C. 1.5 million people were newly infected with chronic hepatitis B. 1.5 million people were newly infected with chronic hepatitis C. Both hepatitis B and hepatitis C can lead to lifelong infection. WHO estimates that 1.1 million deaths occurred in 2019 due to these infections and their effects including liver cancer, cirrhosis, and other conditions caused by chronic viral hepatitis (WHO, 2019). Hepatitis B is the most prevalent form of viral hepatitis and is routinely screened for in pregnancy. The presence of Hepatitis B surface antigen (HBeAg) is associated with high viral loads and infectivity, and antiviral therapy may be required for pregnant women who are HBeAg positive, and the neonates should receive active and passive immunizations. Hepatitis C and D are usually found as chronic infections in the pregnant and non-pregnant population. According to research carried out by an international body called coalition for global hepatitis elimination in 2021, it was discovered that the current prevalence of viral hepatitis in Ondo State Nigeria for Hepatitis C Virus as 1% and that of Hepatitis B Virus as 5.4%. In Nigeria, HBV is the most common cause of liver cancer the fourth leading cause of cancer

Awareness of Hepatitis among Pregnant Women in ... Adedugbe, B. O., Et. al. (2025) deaths (International Agency for Research on Cancer, 2021). Nonetheless, it has continued to be a silent epidemic, as most of the people infected are undiagnosed and do not access treatment and prevention services (Yang et al., 2017). Nigeria has a high burden of hepatitis B virus (HBV) infection, commonly acquired through vertical transmission. However, there is a lack of an efficient surveillance system for monitoring and understanding the epidemiology of HBV among pregnant women. Even though affordable, safe, and effective treatments can prevent liver disease and liver cancer among people living with hepatitis B and cure those living with hepatitis C, WHO estimated that only 10% of people with hepatitis B and 21% of people with hepatitis C worldwide knew they were infected in 2019. Of these, 22% and 62% had received treatment, respectively (WHO, 2021).

Despite the high burden of HBV in Nigeria, there is no efficient surveillance system for monitoring and understanding the epidemiology of the infection (Akindigh et al., 2019). Program data are deficient as pregnant women are not routinely screened for HBV (Olatunde et al., 2021) and population-based serosurveys are not regularly conducted (Moturi et al, 2018). Accurate estimates of the burden of HBV in Nigeria, especially among pregnant women, are needed for rational planning of health services and would allow public-health policymakers to assign sufficient priority and resources to its management and prevention. In the absence of surveillance data, information from multiple studies has been used to generate prevalence estimates. In 2014, a meta-analysis of studies published between 2000 and 2013 in Nigeria estimated the HBV prevalence in pregnant women as 14.1% (95% confidence interval [CI] = 9.6, 18.6%) from 14 studies (Musa et al., 2015). However, the review focused on women attending antenatal care in health facilities. In addition, the infection can be prevented by means of the vaccine launched by the World Health Organization in 1992 to be incorporated into the national immunization program for those countries whose prevalence of the infection is greater than two percent (Olokoba et al., 2011). The lack of medical infrastructure and laboratories, combined with the dramatic shortage of healthcare workers and diagnostic tools, are additional obstacles in developing efficient access to treatment for chronic hepatitis. The challenge is complex and not limited to increasing drug prices. Therefore, strengthening of medical infrastructures and human resources; improved awareness, education and screening; and a demonstration that delivering antiviral therapies is safe, efficient and feasible in Nigeria should be priority. Despite the fact that the Nigerian government has taken a number of steps to reduce the cost of drugs and make them more affordable in primary health centers.

One initiative is the National Drug Distribution Guidelines, which aim to improve the supply and distribution of essential medicines, including vaccines. Nigeria is one in which the drugs are either unavailable or unaffordable to the largely poor masses (Olatunde et al., 2021). This means that several of the infected individuals do not have access to treatment and form the reservoir for the continuous propagation of the virus through contact with body fluids of such infected persons. The natural course, in these individuals, could lead to the main complication of chronic liver disease which accounts for most of the mortality and morbidity. Lack of access to health care facilities is a major factor in the spread of hepatitis B and C in rural areas of Nigeria. People who live in rural areas often have to travel long distances to reach a health care facility, and the quality of care may be lower than in urban areas. that is prevalence in pregnant women attending health care clinic in Akoko southwest and to the need for effective preventive strategies and to mitigate their transmission and impact on pregnant women, the unborn baby and the community at large.

The global prevalence of viral hepatitis is very high and seems to be rising over the years. The infection can profoundly affect pregnant women causing significant maternal and perinatal morbidity and mortality with some strains much worse than others. Research has shown that viral hepatitis is one of the major diseases of mankind and is a serious global public health problem, studies has shown that the level of knowledge and awareness about hepatic is virus among pregnant women is still low, which has led to high increase in infection rate. The low level of knowledge among pregnant women presents a possible threat due to the potential to spread to sexual partners, newborns, the community and the country at large. Despite the availability of hepatitis B vaccine although at varying levels of access, the uptake is considerably low (Mkandawire et al., 2013). Previous research has shown that the hepatitis b virus is the most prevalence amongst pregnant women in Nigeria, despite the availability of hepatitis b vaccine (Olatunde et al., 2021). Therefore, strengthening of medical infrastructures and human resources; improved awareness, education and screening; and a demonstration that delivering antiviral therapies is safe, efficient and feasible in Nigeria, and to the need for effective preventive strategies and to mitigate their transmission and impact on pregnant women, the unborn baby and the community at large. Hence, this study purpose is to investigate the awareness of hepatitis among pregnant women in Akoko south-west, Local Government area, Ondo State, Nigeria.

Objectives of the Study

The main purpose of this study is to investigate the Awareness of Hepatitis among Pregnant women in Akoko South-west Local Government area, Ondo State, Nigeria. The following specific objectives are to;

1. Determine the prevalence of hepatitis among pregnant women in Akoko southwest local government area Ondo state.
2. Evaluate the knowledge hepatitis among pregnant women in Akoko southwest local government area Ondo state
3. Assess the difference of the following demography (Age and Religion) on the awareness of hepatitis among pregnant women in Akoko southwest local government area Ondo state.

Research questions

1. What is the prevalence of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?
2. What is the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?
3. What is the difference of the following demographics variables (Age and Religion) on the knowledge of hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Hypotheses

H₀₁: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across age group.

H₀₂: There will be no significant difference on knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across religion group.

Methodology

The descriptive survey research design was used for this study. This research involves collecting data in order to test hypotheses or to answer questions about the opinions of people about some topic or issue. The population of this study comprised all the pregnant women in Akoko-south West, Local Government, Ondo State. The sample for this study was 300 respondents. For the purpose of this study, the researcher made use of only public healthcare center in Akoko southwest local government area Ondo state, which consisted of 34 government healthcare facility. The respondents were drawn through a multistage sampling procedure; Stage One: Selection of Schools: A simple random sampling techniques of fish bowl without replacement was used to select fifteen (15) health centers within the selected study area. Stage Two: Selection of participants: From the selected health centers, disproportionate stratified sampling technique was used to select the number of respondents that represented each school. Hence, fifteen (15) respondents represented each center. Stage Three: Selection of Respondents: Within each selected center, voluntary sampling techniques was used to select the participants. The resultants 300 participants constituted the respondents for the study. Data was collected using a self-constructed questionnaire titled Awareness of Hepatitis among pregnant women specifically designed for this study. The reliability of the instrument was measured using the test-re-test method and resultant value of 0.70 was obtained. The responses utilized modified four Likert point which was scored as Strongly Agree (SA) – 4, Agree (A) - 3, Disagree (D) - 2 and Strongly Disagree (SD) - 1 for positively worded question items and were reversed if the statement is negative. In addition, the average mean score for this study was pegged at 2.50. Therefore, any mean score that is below 2.50 (0-2.49) was considered poor, 2.50-2.99 was considered average and 3.0 upward was considered high. The data collected was analyzed using descriptive and inferential statistics. The descriptive statistics was used to answer the research questions, while inferential statistics was used to answer the hypotheses at alpha level 0.05.

Presentation of Results

Table 1: Frequency table showing demographic characteristics

Variables		Frequency	Percentage
Age	18 – 23	40	13.3
	24 – 30	178	59.4
	31 and above	82	27.3
Total		300	100.0
Religion	Christian	188	62.7
	Muslim	84	24
	Traditional	28	9.3
Total		300	100

Awareness of Hepatitis among Pregnant Women in ... Adedugbe, B. O., Et. al. (2025)

Source: Field survey, (2025)

Table 1 revealed that 40 (13.3%) of the respondents were aged 18 - 23, 178 (59.4%) were between 24 - 30, while 82 (27.3%) were 31 and above. Furthermore, in religion, 188 (62.7%) were Christians, 84 (24%) were Muslims while 28 (9.3%) were traditional worshippers. While 182 (60.7%) were Yorubas', 42 (14%) were Igbos' while 76 (25.3%) were grouped under cultural background.

Research Question 1: What is the prevalence of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Table 2: Prevalence rate of hepatitis B virus among pregnant women in Akoko-South West

S/N	ITEMS	YES (%)	NO (%)	TOTAL
1	Have you received any hepatitis virus vaccine?	213 (71%)	87 (29%)	300 (100%)
2	Have you been previously diagnosed with hepatitis B virus ?	36 (12%)	264 (88%)	300 (100%)
3	Do you know your hepatitis B status?	207 (69%)	93 (31%)	300 (100%)

Source: Field survey (2025)

The above table disclosed the prevalence of hepatitis B virus among pregnant women attending health care clinic Akoko-south west Local government area, Ondo state. In item 1, 213 (71%) of the respondents agreed that they have received Hepatitis Virus Vaccine, while 87 (29%) are yet to receive. In Item 2, 36 (12%) of the respondents agreed that they have previously been diagnosed with Hepatitis B virus, while, 264 (88%) of the respondents disagreed. In item 3, 207 (69%) of the respondents agreed that they know their Hepatitis B virus status while 93(31%) disagreed.

Research Question 2: What is the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Table 3: Descriptive analysis showing the knowledge of HBV

Items	SD %	D%	A%	SA %	x	Decision
Hepatitis be virus can be transmitted through sexual activities	87 (29%)	115 (38.3%)	50 (16.7%)	20 (6.6%)	2.10	Disagreed
Hepatitis B virus may lead to death	68 (22.7%)	106 (35.3%)	120 (40%)	6 (2%)	2.21	Disagreed
Hepatitis B virus is a disease of the liver	60 (20%)	102 (34%)	80 (26.7%)	58 (19.3%)	2.45	Disagreed
Hepatitis can be transmitted from mother to child during delivery's	47 (15.7%)	127 (42.3%)	89 (29.7%)	37 (12.3%)	2.39	Disagreed
Hepatitis B positive patient is likely not to manifest any signs and symptoms	53 (17.7%)	92 (30.7%)	102 (34%)	53 (17.7%)	2.52	Agreed
Hepatitis b virus can be transmitted through shaking of hands.	87 (29%)	69 (23%)	87 (29%)	57 (19%)	2.38	Disagreed
There are other variants of the virus apart from Hepatitis B virus.	45 (15%)	93 (31%)	110 (36.7%)	52 (17.3%)	2.56	Agreed
A mother with Hepatitis B virus can transmit it to her baby during breastfeeding.	63 (21%)	74 (24.7%)	113 (37.7%)	50 (16.7%)	2.50	Agreed
Hepatitis B virus can infect anyone	97 (32.3%)	54 (18%)	111 (37%)	38 (12.7%)	2.30	Disagreed
Hepatitis B can be transmitted through contact with bodily fluid	78 (26%)	131 (43.7%)	66 (22%)	25 (8.3%)	2.13	Disagreed

Grand Mean = 2.35

Source: Field Survey, (2025).

Table 3 showed that majority of the respondents disagreed that Hepatitis be virus can be transmitted through sexual activities; they are unaware that Hepatitis B virus may lead to death; they lack understanding that Hepatitis B virus is a disease of the liver; majority of the respondents disagreed that Hepatitis can be transmitted from mother to child during delivery's; they are aware that Hepatitis B positive patient may likely be asymptomatic; the respondents disagreed that Hepatitis b virus cannot be

DOI: <https://doi.org/10.64348/zije.202549>

Awareness of Hepatitis among Pregnant Women in ... Adedugbe, B. O., Et. al. (2025)
 transmitted through shaking of hands; they agreed that there are other variant of the virus apart from Hepatitis B virus; they understood mothers with Hepatitis B are at risks of infecting their baby during breastfeeding; furthermore, the respondents disagreed that the disease can infect anyone; lastly, they disagreed that Hepatitis B can be transmitted through contact with bodily fluid. Hence, the grand mean score of 2.35 was lesser than the average mean score of 2.50 according to the benchmark set for this study. Therefore, the result indicated that the respondents showed a low level of knowledge of Hepatitis.

Hypotheses Testing

H₀₁: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across age group.

Table 4: ANOVA analysis on difference of Age on the knowledge of Hepatitis B virus.

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups		2	63.783	6.086	.003
Within Groups	127.566	297	10.481		
	3112.781				
Total	3240.347	299			

Source: Field Survey (2025)

Table 4 presented an ANOVA analysis of difference of age on the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government Area. The table showed that there was significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age group ($F = 6.086$, $df = 299$, $p < 0.05$). Therefore, the null hypothesis which stated that there will be no significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age group is rejected.

Table 5: Post Hoc analysis on difference of age on knowledge of Hepatitis among Pregnant Women

Age	N	Mean	Std. Deviation	Std. Error	95 % Confidence Interval for Mean	
					Lower Bound	Upper Bound
18 – 23	40	32.0417	1.82921	.37339	31.2693	32.8141
24 – 30years	178	30.3073	3.37598	.24364	29.8267	30.7879
31years above	82	31.5238	3.21696	.35100	30.8257	32.2219
Total	300	30.7867	3.29200	.19006	30.4126	31.1607

Source: Field Survey, (2025)

Table 5 showed the Post hoc test results revealed that respondents between the age category of 24 - 30 years of age had significantly lower knowledge of Hepatitis ($x = 30.31$, $SD = 3.38$) compared to those below 18 - 23 years of age ($x = 32.04$, $SD = 1.82$) and 31 years and above ($x = 31.52$, $SD = 3.22$).

H₀₁: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across religion group.

Table 6: ANOVA analysis showing difference of religion on the knowledge of Hepatitis

Group	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	85.376	2	42.688	4.019	.019
Within Groups	3154.971	297	10.623		
Total	3240.347	299			

Source: Field Survey (2025)

Table 5 showed an ANOVA analysis on difference of religion on the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo State. The table showed that there is significant difference of religion on the knowledge of pregnant women in pregnant women in Akoko-South West Local Government area of Ondo State ($F = 4.019$, $df = 299$, $p < 0.05$). thus, the null hypothesis which stated that There will be no significant difference on knowledge of hepatitis

DOI: <https://doi.org/10.64348/zije.202549>

Awareness of Hepatitis among Pregnant Women in ... Adedugbe, B. O., Et. al. (2025)
 virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across religion group is rejected for this study.

Table 7: Post Hoc analysis on difference of religion on the knowledge of Hepatitis among Pregnant women.

Group	N	Mean	Std. Deviation	Std. Error	Lower Bound	95% Confidence Interval for Mean
						Upper Bound
Christianity	188	30.6743	3.21279	.21760	30.2454	31.1032
Muslim	84	30.7703	3.47810	.40432	29.9645	31.5761
traditional	28	34.0000	2.13809	.75593	32.2125	35.7875
Total	300	30.7867	3.29200	.19006	30.4126	31.1607

Source: Field Survey (2025)

Table 6 showed the Post hoc test results revealed that people who are traditional worshipers had significantly higher level of knowledge of induced abortion ($x = 34.00$, $SD = 2.14$) compared to Christians ($x = 30.67$, $SD = 3.12$) and Muslims ($x = 30.77$, $SD = 3.45$).

Discussion of Findings

The finding indicated that pregnant women in of hepatitis virus in Akoko-South West, Local Government area of Ondo state have low level of knowledge of Hepatitis B virus. This finding is in agreement with previous study conducted by Ajuwon, (2021), a study consisting of 400 pregnant women, the study shows that there is lack of knowledge, where only 99(24.8%) knew that hepatitis is a viral infection affecting the liver and 27(6.8%) pregnant thought it is an eye infection (Ajuwon, 2021). Furthermore, studies have shown that a proportion of expectant mothers from mostly endemic countries have suboptimal knowledge related to HBV infection and its transmission (Han,Yin et al, 2017). For example, 76% of pregnant women in Nigeria had inadequate HBV knowledge (Akindigh et al. 2019) and in a study from China, 20% of pregnant women were not aware that HBV can be transmitted from mother to infant (Hou et al., 2005).

The study also indicated that there is a significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age. In a previous study by Mohammed et al., (2020), it was observed that younger pregnant women (aged 18–25) often demonstrate lower awareness of hepatitis transmission, prevention, and complications compared to older pregnant women (aged 26–35). However, the current study showed a sharp contrast where younger women had higher knowledge compared to older pregnant women. This may be as a result of the fact that younger women of this study area are more exposed to learning opportunities compared to their older counter parts and access to mobile phone and its usage may have contributed to their knowledge of Hepatitis. However, in general, the respondents have low level of knowledge on Hepatitis. Conversely, some studies suggested that advanced maternal age (≥ 35 years) does not necessarily correlate with higher hepatitis knowledge. A cross-sectional study by El-Gilany and El-Fedawy (2018) revealed that while middle-aged pregnant women (26–34 years) had the highest hepatitis knowledge scores, older women (≥ 35 years) showed declining awareness, possibly due to outdated health beliefs or reduced engagement with newer health information.

The study also indicated that there is a significant difference in knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across religious groups. For instance, a study by Ojo et al., (2021), showed that faith-based organizations often serve as trusted sources of health information, particularly in communities with limited access to formal healthcare systems. For instance, in Nigeria, religious leaders were found to disseminate health messages about hepatitis B prevention through sermons and community programs, leading to improved knowledge among pregnant women (Adebayo et al., 2020). In another vein, some religious beliefs may also perpetuate misconceptions, such as the notion that divine intervention alone can prevent hepatitis, thereby discouraging medical testing and vaccination (Yousafzai et al., 2019).

Conclusion

Awareness of Hepatitis among Pregnant Women in ... Adedugbe, B. O., Et. al. (2025)

The study concluded that the level of knowledge of hepatitis virus among pregnant women attending health care clinic in Akoko southwest is low. Furthermore, Age and Religious groups showed significant difference on the knowledge of hepatitis among pregnant in Akoko South-west Local Government area of Ondo State, Nigeria.

Recommendations

Consequent upon the conclusion of the findings, the following recommendations were made;

1. Maternal knowledge is very important in the prevention of hepatitis B virus which could be done through government partnership with various health centers to organize symposia on the transmission routes, the importance of timely vaccination and screening, leverage on digital platform to propagate reliable information on Hepatitis B virus to pregnant women.
2. The government in conjunction with various healthcare facilities providers should provide free or cost-effective HBV screenings, vaccination, ensuring that investment is made in healthcare infrastructure to enhance diagnostic capabilities and support services for individual living with hepatitis B.
3. Religion leaders should also intensify and assists the government by inviting health care providers to disseminate health talks through seminars.

Acknowledgements

My appreciation goes to the experts in the department of human kinetics and health education with regards to their contribution to the success of this work especially in the area of validation of the research instrument. Furthermore, I also acknowledge the efforts of the two co-authors towards the completion of this work. Lastly, I am grateful to the respondents for their time in participating in this research and ensuring the successful completion of this study. All efforts are duly appreciated.

References

- Adebayo, S. B., Oladimeji, K. E., & Adeoye, A. O. (2020). Role of religious leaders in promoting hepatitis B awareness among pregnant women in Southwest Nigeria. *Journal of Religion and Health*, 59(3), 1124-1135.
- Ajuwon, G. J. (2021). Hepatitis B virus infection in Nigeria: a systematic review and meta-analysis of data published between 2010 and 2019.
- Akindigh, T. M., Joseph, A. O., Robert, C. O., Okojoku, O. J., Okechalu, J.N. & Anejo-Okopi, J. A. (2019). Seroprevalence of hepatitis B virus co-infection among HIV-1-positive patients in North-Central Nigeria: The urgent need for surveillance. *Afr J Lab Med*.
- Al-Ma'aitah, R., Al-Kloub, M., & Al-Rawashdeh, A. (2019). Knowledge and attitudes toward hepatitis B infection among pregnant women in Jordan. *Journal of Transcultural Nursing*, 30(3), 222–229.
- Mkandawire, P., Richmond, C., Dixon, J., Luginaah, I.N. & Tobias, J. (2013). Hepatitis B in Ghana's upper west region: a hidden epidemic in need of national policy attention. *Health & place*
- Mohammed, B. A., Abdulkadir, M. B., & Adeboye, M. A. (2020). Hepatitis B knowledge and vaccination status among pregnant women in Nigeria: A hospital-based study. *BMC Preg. and Childbirth*, 20(1), 1–8.
- Moturi, E., Tevi-Benissan, C., Hagan, J., Shendale, S., Mayenga, D., & Murokora, D. (2018). Implementing a Birth Dose of Hepatitis B Vaccine in Africa: Findings from Assessments in 5 Countries. *J Immunol Sci*.
- Musa, B. M., Bussell, S., Borodo, M. M., Samaila, A. A. & Femi, O. I. (2015). Prevalence of hepatitis B virus infection in Nigeria, 2000–2013: a systematic rev. and meta-analysis. *Niger J Clin Pract.* ;18(2):163–72.
- Ojo, O. O., Adeyemo, W. L., & Ogunbodede, E. O. (2021). Religious organizations as health information hubs for pregnant women in Sub-Saharan Africa. *Journal of Community Health*, 46(4), 712-721.
- Olatunde, B. O., Adeyinka, D. A., Ndukwe, C. D., Oladele, T. T., Yahaya H. B. & Ijaodola, O. A. (2021). Antenatal hepatitis B screening in Nigeria: A comparative analysis with syphilis and HIV. *Int J STD AIDS*.
- Olokoba, A. B., Salawu, F. K., Danburam, A., Olokoba, L. B., Midala, J. K. (2011). Hepatitis B virus infection amongst pregnant women in North eastern Nigeria- a call for action. *Niger J Clin Pract* 14: 10 13
- World Health Organization, (2019). Global hepatitis report 2017: web annex A: estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2017.
- World Health Organization. (2021). Global hepatitis report 2021: Action for access in low- and middle-income countries.
- Yang, J. D., Mohamed, E. A., Aziz, O. A., Shousha, H. I., Hashem, M. B. & Nabeel M.M. (2017). Characteristics, management, and outcomes of patients with hepatocellular carcinoma in Africa: a multicountry observational study from the Africa Liver Cancer Consortium. *Lancet Gastroenterol Hepatol*.