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Awareness, Risk Factors and Prevalence of Viral Hepatitis B and C among Antenatal Attendees in Federal Medical Centre, Asaba: A Cross-sectional Study

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Authors' contributions

This work was carried out in collaboration among all authors. Author SIO designed the study and wrote the first draft of the manuscript. Authors ORS, DNO, OA and BA wrote the proposals. Author JIC managed the data analysis of the study. Author DTO administered the questionnaires. All other authors contributed in structuring and editing the manuscripts. All authors read and approved the final manuscript.

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Original Research Article

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Abstract

Aim: To evaluate the level of awareness, risk factors, and prevalence of viral hepatitis B and C among antenatal attendees at Federal Medical Centre, Asaba.
Place and Duration of Study: Federal Medical Centre, Asaba, Delta State, from June to October 2025.
Methodology: This hospital-based descriptive cross-sectional study involved 145 pregnant women attending the antenatal clinic at Federal Medical Centre, Asaba, from June to October 2025. Ethical approval was obtained before the commencement of the study, and informed consent was secured from all participants prior to enrolment. Data on participants' sociodemographic characteristics, level of awareness, knowledge, and possible risk factors associated with hepatitis B and C infection were collected using a pretested structured questionnaire. Approximately 3 mL of venous blood was collected aseptically from each participant and analysed for hepatitis B surface antigen (HBsAg) and hepatitis C virus antibodies using standard rapid diagnostic test kits. The data obtained were analysed using IBM SPSS Statistics, with both descriptive and inferential statistical methods applied. Statistical significance was set at $p \leq 0.05$.
Results: Of the 145 pregnant women who attended the antenatal clinic, most were between 21 and 30 years old (72.4%), and almost all were married (96.6%). Awareness of hepatitis B was relatively high, with about three-quarters of participants having heard of it (75.2%), while awareness of hepatitis C was lower (58.6%). Overall, participants demonstrated a moderate understanding of how these infections are transmitted (52.4%). Healthcare professionals were the most commonly reported source of information on viral hepatitis (46.9%). Although a large proportion of the women acknowledged the importance of hepatitis B vaccination (77.9%), only a small number had received the vaccine (13.1%). Screening results showed that 2.8% of the participants tested positive for hepatitis B, while none tested positive for hepatitis C.
Conclusion: The findings indicate that although awareness of viral hepatitis among pregnant women was fairly encouraging, the low uptake of hepatitis B vaccination remains a major concern. This highlights the need for stronger health education during antenatal visits, regular screening, and improved preventive measures to reduce the burden of hepatitis infections among pregnant women.

Keywords: *Viral hepatitis B; viral hepatitis C; awareness; risk factors; antenatal attendees; federal medical centre asaba.*

1. Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are hepatotropic viruses. HBV is a hepatotropic DNA virus belonging to the family Hepadnaviridae, with double-stranded DNA and a shell containing hepatitis B surface antigen (HBsAg) around the core antigen (Seeger & Mason, 2000), whereas HCV is a hepatotropic, positive-sense, single-stranded RNA virus (Martinello *et al.*, 2023). Globally, HBV is a frequent cause of both

acute and chronic viral hepatitis. Based on intergroup divergence, phylogenetic analysis classifies HBV into eight genotypes (A to H). Of these, individuals with chronic HBV are more likely to have genotypes B and C, whereas individuals with acute HBV are more likely to have genotype A. Human hepatitis caused by HBV can manifest as either acute or chronic infection. Pregnancy-related acute hepatitis B is not linked to a greater rate of abortion, stillbirth, or congenital deformity; however, a higher prevalence of low birth weight has been reported (Sookoian, 2007).

HBV consists of many antigenic components, including hepatitis B surface antigen (HBsAg), hepatitis B core antigen (HBcAg), and hepatitis B envelope antigen (HBeAg). By rearranging the reading frames throughout the same genetic material, the 3,200 nucleotides that make up the HBV genome may encode four distinct protein groups and the regulatory elements that regulate them (Chisari *et al.*, 1989). A reaction to HBcAg and HBsAg provides immunity against HBV infection. Antibodies against HBcAg, known as anti-HBc, are a sign of infection. In contrast to IgG anti-HBc, which lasts a lifetime and reflects prior infection, IgM anti-HBc indicates current infection and often disappears within six months. Following vaccination or the clearance of HBsAg, antibodies against HBsAg (anti-HBs) are detectable. In chronic HBV infection, HBsAg persists for more than six months (Bertoletti & Kennedy, 2015). HBV is a major causative factor of chronic liver disease (CLD), with over 2 billion individuals worldwide having HBV infection, 350 million of whom have chronic infection, and more than a million people dying from CLD linked to HBV each year (El-Serag, 2012). Navabakhsh *et al.* (2011) demonstrated that about half of all cases of chronic hepatitis B (CHB) infection globally are caused by mother-to-child transmission (MTCT). Furthermore, women who are chronic carriers of HBV or who are acutely infected with the virus are likely to transmit the virus to their children during birth if prophylaxis or antiviral therapy is not administered (Chang, 2007).

Hepatitis C virus infection is a serious global public health risk. Over one million new cases of HCV infection occur each year, with the majority of these cases occurring in Africa, and the WHO estimates that approximately 3% of the world's population is chronically infected with the virus (World Health Organization [WHO], 1999; Lemoine *et al.*, 2015). The most efficient route of HCV transmission is direct percutaneous inoculation; however, vertical, household, sexual, and occupational transmission may also occur (Memon & Memon, 2002). Furthermore, because HCV is a blood-borne infection, it is mostly contracted through unsafe injection practices, unsafe medical treatment, illicit parenteral drug use (sharing injection needles), and blood transfusions involving unscreened blood. Although these routes of transmission are less common, the infection can also be transmitted from an infected pregnant woman to her unborn child and through unsafe sexual behaviours that may result in exposure, including having multiple sexual partners and sex between men (World Health Organization [WHO], 1999).

Awareness and knowledge of viral hepatitis B and C among pregnant women are important components of prevention and control, particularly because pregnancy provides an opportunity for health education, screening, vaccination and prevention of mother-to-child transmission. Awareness refers to whether an individual has heard about a disease, while knowledge encompasses the individual’s understanding of its causes, modes of transmission, symptoms, prevention and available diagnostic or preventive measures. Adequate knowledge may encourage pregnant women to seek screening, adopt preventive practices and comply with recommended interventions during antenatal care.

Despite the importance of antenatal care as an avenue for health education and preventive services, gaps in knowledge and misconceptions about viral hepatitis may persist among pregnant women. Some women may be aware of hepatitis B and C without having adequate knowledge of their routes of transmission, prevention, vaccination, and the possibility of mother-to-child transmission. Differences in awareness and knowledge may also influence healthcare-seeking behaviour, screening practices, and uptake of hepatitis B vaccination. Therefore, assessing both awareness and knowledge among antenatal attendees is essential for identifying areas requiring targeted health education and strengthening preventive interventions within antenatal services.

Recent Nigerian evidence similarly indicates that, despite awareness of hepatitis B among many pregnant women, important gaps may remain in knowledge and the use of preventive services (Ade-Ojo *et al.*, 2023; Enebe *et al.*, 2024; Ugwu *et al.*, 2026).

Recent literature from low- and middle-income settings also supports strengthening community-oriented awareness, screening, and vaccination strategies as complementary components of hepatitis B control (Abioke *et al.*, 2026).

Current reviews further emphasise antenatal screening, vaccination, and prevention of mother-to-child transmission as central components of hepatitis B control during pregnancy (Nartey & Bockarie, 2024).

During pregnancy, viral hepatitis is closely associated with high-risk maternal complications such as preterm labour, vaginal bleeding, premature rupture of membranes, preterm delivery, placenta praevia, gestational diabetes mellitus, and even mortality. Additionally, there is a high rate of vertical transmission leading to foetal and neonatal hepatitis (Lu *et al.*, 2012). Hence, programme managers and health planners may find the information and outcomes of this study useful, as the study aimed to identify the prevalence, awareness, and risk factors associated with HBV and HCV infections among pregnant women attending the antenatal clinic at Federal Medical Centre, Asaba.

Although the manuscript describes the relevance of awareness, risk factors, and prevention of viral hepatitis in pregnancy, local evidence simultaneously assessing awareness, reported risk factors, and the prevalence of both HBV and HCV among antenatal attendees at Federal Medical Centre, Asaba, remains limited.

1.1 Objective

The objective of this study was to assess awareness, reported risk factors and the prevalence of hepatitis B and C virus infections among pregnant women attending the antenatal clinic at Federal Medical Centre, Asaba.

2. Materials and Methods

2.1 Study Region

This study was conducted at Federal Medical Centre, Asaba, Delta State. It is a tertiary healthcare facility that serves as a referral centre for Delta, Anambra, Edo, and Bayelsa States. The study used a hospital-based, descriptive cross-sectional design and included 145 pregnant women who attended antenatal care at the aforementioned hospital from June to October 2025.

2.2 Study Population

The study population comprised pregnant women attending antenatal care at the Obstetrics and Gynaecology Department of Federal Medical Centre, Asaba, Delta State, during the study period from June to October 2025. A total of 145 pregnant women who met the eligibility criteria and consented to participate were enrolled in the study.

2.2.1 Inclusion Criteria

Pregnant women attending antenatal care at Federal Medical Centre, Asaba, during the study period who provided informed consent and were willing to participate in the study were included.

2.2.2 Exclusion Criteria

Pregnant women who declined to participate, were unable to provide the required information, or had incomplete questionnaires were excluded from the study.

2.3 Data Collection and Laboratory Analysis

A pretested structured interviewer-administered questionnaire was used by trained research assistants to collect data on demographic characteristics, socioeconomic status, awareness and knowledge, and associated risk factors. HIV status was extracted from participants' case records. Knowledge of viral hepatitis was assessed using three questions: Have you heard of viral hepatitis? Do you know what it is? Which organ of the body is affected? A participant was considered knowledgeable if he or she scored two or above.

Three millilitres (3 mL) of venous blood were collected from each consenting participant following standard aseptic procedures. The blood sample was placed in a labelled plain container and allowed to clot. Serum was extracted after centrifugation at 3,000 rpm for five (5) minutes. Samples were either analysed immediately or stored at -20°C until analysis.

Samples were screened for HBsAg and HCV antibodies using Global strips (Lot No. HBSG19070062) and (Lot No. HCV18070021) for HBsAg and HCV, respectively (Alltest Biotech Co. Limited, China). Both kits have specificity and sensitivity of 99.4% and 99.7%, respectively. HBsAg-positive samples were screened for HBsAg, HBsAb, HBeAg, HBeAb, and HBcAb using a 5-in-1 HBV TEST CASSETTE (Lot No. SKY201810TEC) (SKYTEC). All test strips and cassettes used were quality controlled using known samples. Screening was performed strictly according to the manufacturer's instructions.

2.4 Data Management and Analysis

Data were collected and entered into the database on a weekly basis. Confidentiality of the collected data was ensured, as identifiers were not included and data access was strictly restricted to the research team. At the end of the study, the data were subjected to descriptive and inferential statistical analyses using IBM Statistical Package for the Social Sciences (SPSS), version 22.0. Continuous variables were expressed as means and standard deviations, while categorical variables were summarised as percentages. Chi-square and Fisher's exact tests were used to assess associations between study variables. P-values of ≤ 0.05 were considered statistically significant.

3. Results and Discussion

Table 1. Sociodemographic characteristics of respondents

Variable	Frequency (N)	Percentage
Age group (years)		
21-30	105	72.40%
31-40	34	23.40%
41 & Above	6	4.10%
Marital Status		
Married	140	96.60%
Single	5	3.40%

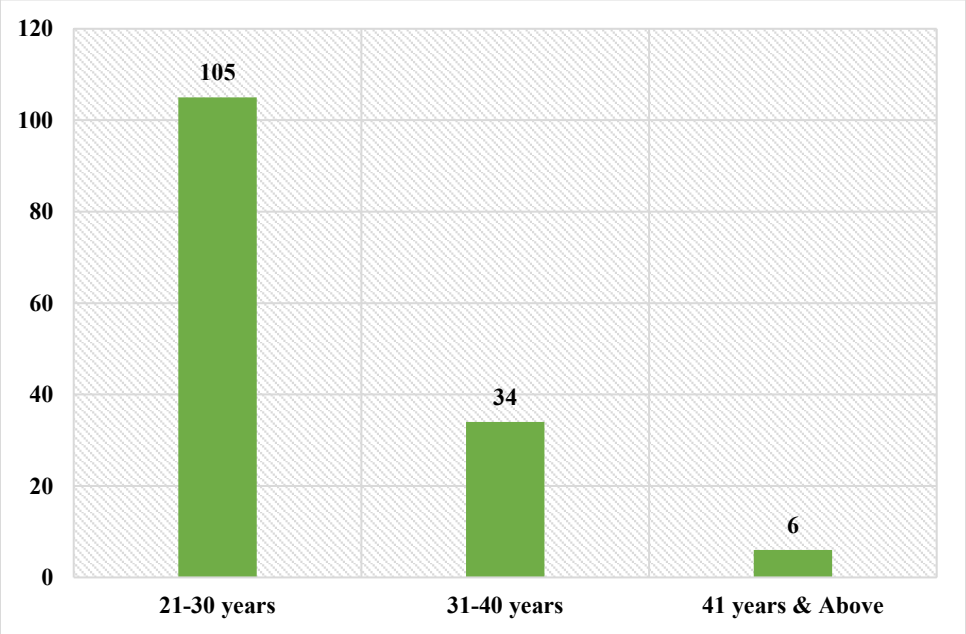


Fig. 1. Distribution of age group (years) of respondent

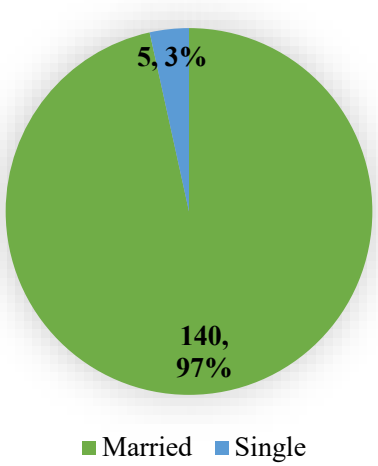


Fig. 2. Distribution of marital status of respondents (n, %)

Table 2. Awareness of Hepatitis B and C

Variable	Yes n (%)	No n (%)
Have you heard of hepatitis B?	109 (75.20)	36 (24.80)
Have you heard of hepatitis C?	85 (58.60)	60 (41.40)
Aware of mother-to-child transmission	97 (66.90)	48 (33.10)
Awareness of Hepatitis B vaccine	79 (54.50)	66 (45.50)

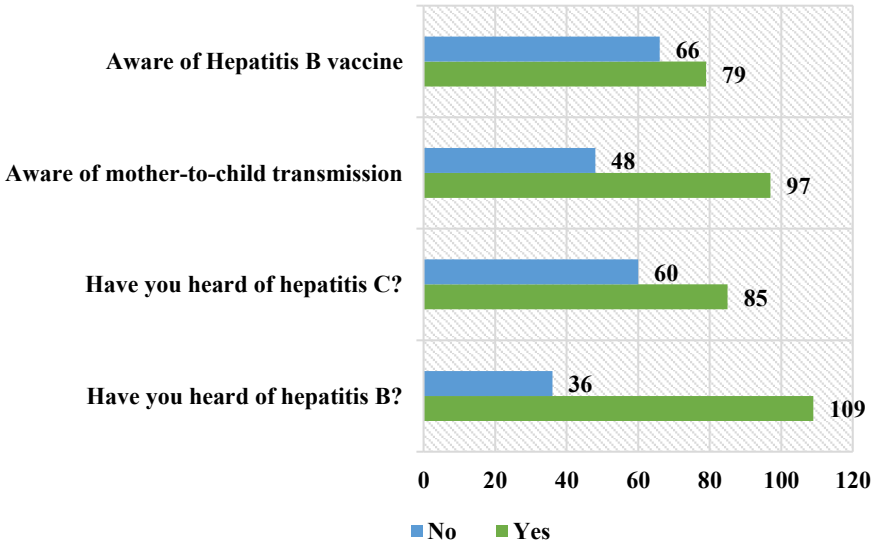


Fig. 3. Distribution of awareness of Hepatitis B and C, Hepatitis B vaccine and mother to child transmission of hepatitis B and C

Table 3. Sources of information on Hepatitis B/C

Source of Information	Frequency (n)	Percentage (%)
Health Worker	68	46.90%
Family	10	6.90%
Media	43	29.70%
Others	4	2.80%

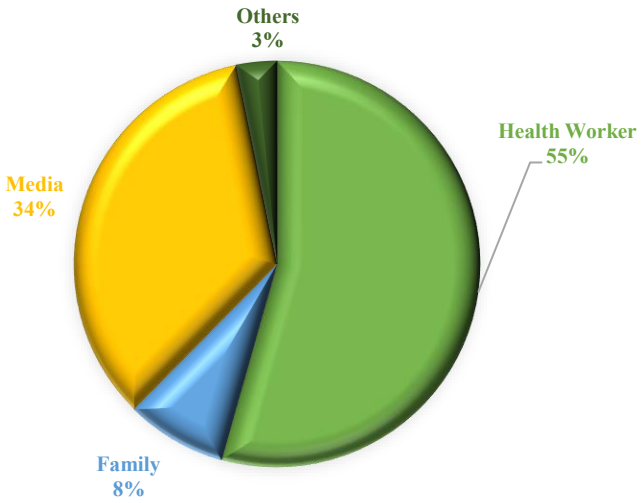


Fig. 4. Distribution of sources of information on Hepatitis B/C

Table 4. Knowledge of transmission modes

Mode of Transmission	Frequency (n)	Percentage (%)
Blood	62	42.80%
Parents	14	9.70%
Saliva	23	15.90%
Not certain	46	31.70%

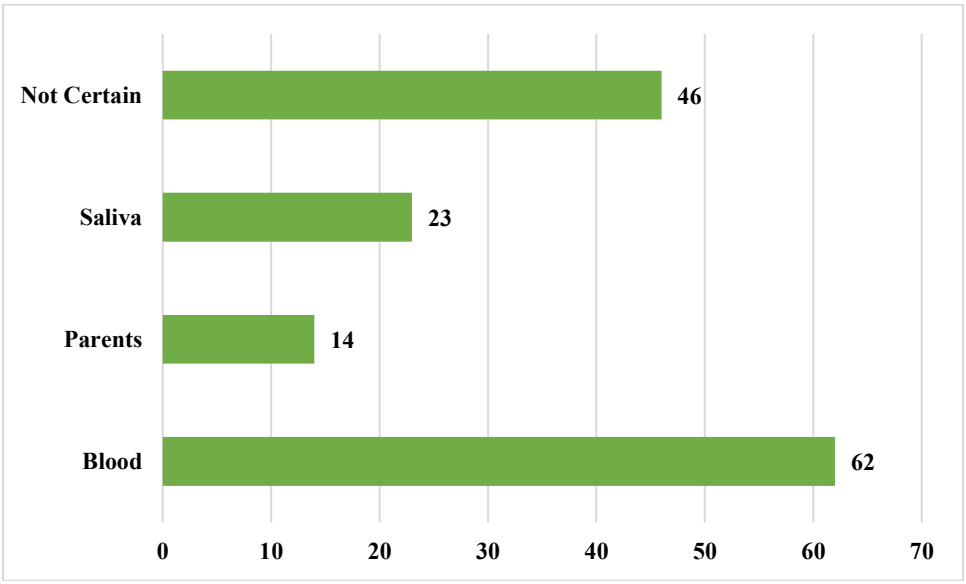


Fig. 5. Distribution of knowledge of transmission modes among respondents

Table 5. Response category of transmission modes

Mode of transmission Response Category	Frequency (n)	Percentage (%)
Correct knowledge	76	52.42%
Incorrect knowledge	23	15.86%
Not Certain	46	31.72%

Table 6. Risk factors among respondents

Risk Factor	Yes n (%)	No n (%)
History of blood transfusion	22 (15.20)	123 (84.80)
Shared needles/syringes	23 (15.90)	122 (84.10)
Unprotected sex with multiple partners	24 (15.90)	123 (84.10)
History of jaundice	16 (11.00)	129 (89.00)

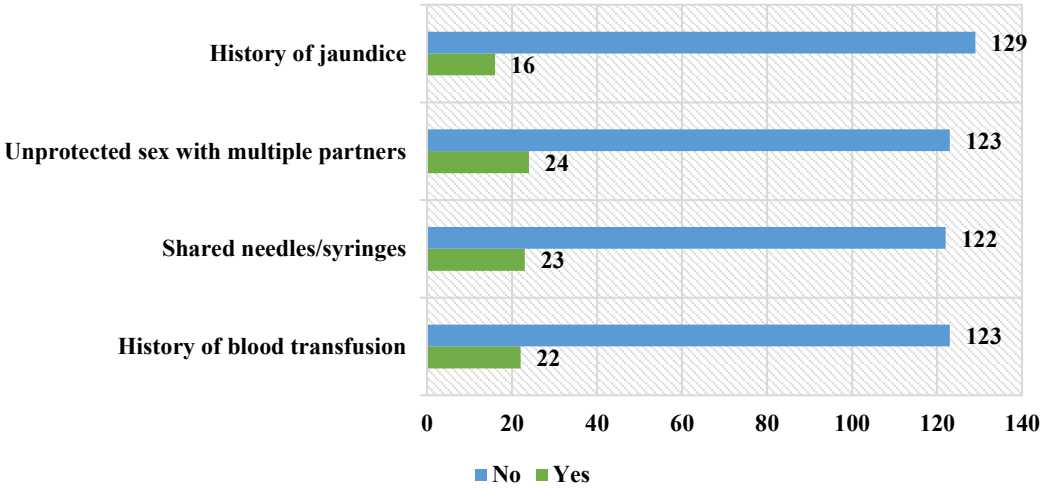


Fig. 6. Distribution of risk factors among respondents

Table 7. Testing and vaccination status

Variable	Yes n (%)	No n (%)
Ever tested for Hepatitis B before this time?	57 (39.30)	88 (60.70)
Ever tested for Hepatitis C before this time?	28 (19.30)	117 (80.70)
Received Hepatitis B vaccine	19 (13.10)	126 (86.90)
Believe vaccination is important	113 (77.90)	32 (22.10)

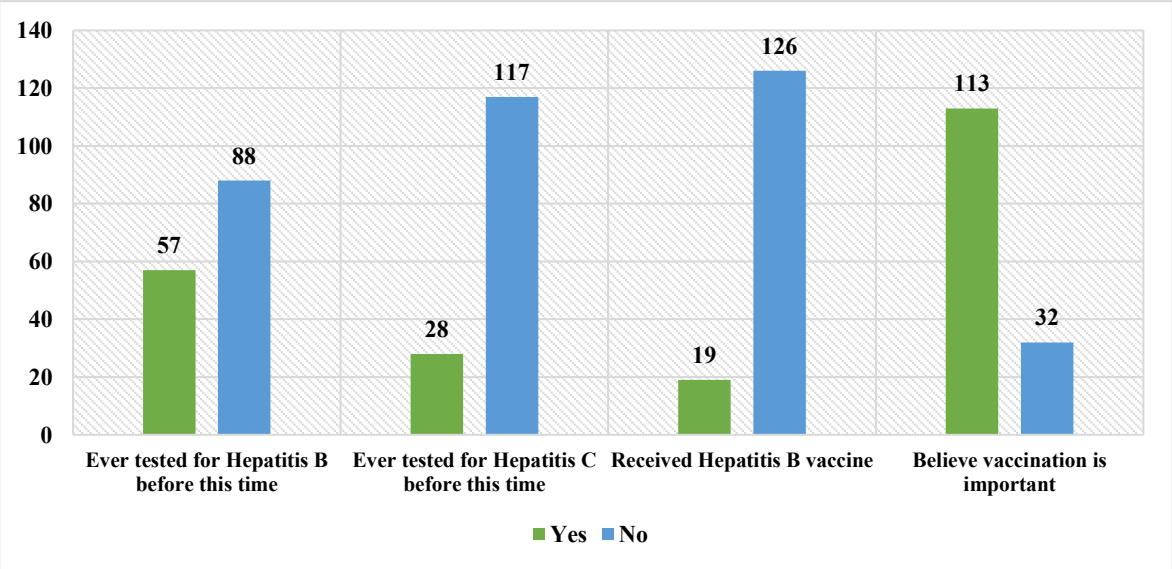


Fig 7. Distribution of testing and vaccination status among respondents

Table 8. Association between awareness of Hepatitis B and uptake of Hepatitis B vaccination (n = 145)

Awareness of Hepatitis B	Vaccinated n (%)	Not Vaccinated n (%)	Total n (%)	χ^2	p-value
No	1 (2.8)	35 (97.2)	36 (24.8)		0.044*
Yes	18 (16.5)	91 (83.5)	109 (75.2)	4.484	

Table 9. Association between age group and awareness of Hepatitis B (n = 145)

Age Group (years)	Aware n (%)	Not Aware n (%)	Total n (%)	χ^2	p-value
21-30	78 (74.3)	27 (25.7)	105 (72.4)	0.604	0.739
31- 40	27 (79.4)	7 (20.6)	34 (23.4)		
≥ 41	4 (66.7)	2 (33.3)	6 (4.1)		

Table 10. Hepatitis test result

Hepatitis Test Results	Frequency (n)	Percentage (%)
HBV Result		
Negative	141	97.20%
Positive	4	2.80%
HCV Result		
Negative	145	100.00%

Table 1 presents the sociodemographic characteristics of the 145 antenatal attendees enrolled in this hospital-based cross-sectional study on the awareness, risk factors, and prevalence of viral hepatitis B and C at Federal Medical Centre, Asaba. The findings show that most respondents were in the 21–30-year age group, accounting for 72.4% (105) of participants, indicating that most antenatal attendees were young adults in their prime reproductive years. This was followed by those aged 31–40 years, who constituted 23.4% (34) of the study population, while only 4.1% (6) were aged 41 years and above, demonstrating a relatively low representation of older pregnant women. Regarding marital status, an overwhelming majority of respondents were married, representing 96.6% (140) of participants, while only 3.4% (5) were single. These findings suggest that the study population was predominantly composed of young, married women, which reflects the typical demographic profile of antenatal clinic attendees in many Nigerian tertiary health institutions. This demographic pattern is important because age and marital status may influence awareness levels, exposure to risk factors, healthcare-seeking behaviour, and the overall burden of viral hepatitis among pregnant women in the study setting.

Table 2 presents respondents' awareness of viral hepatitis B and C among antenatal attendees at Federal Medical Centre, Asaba. The findings indicate a relatively high level of awareness of hepatitis B, with 75.2% (109) of respondents reporting that they had heard of the infection, while 24.8% (36) had no prior knowledge of it. Awareness of hepatitis C was comparatively lower, with 58.6% (85) indicating awareness and 41.4% (60) reporting no awareness. Regarding knowledge of transmission routes, 66.9% (97) of respondents were aware that hepatitis B and C can be transmitted from mother to child, whereas 33.1% (48) were unaware of this important route of infection. Awareness of preventive measures was moderate, as 54.5% (79) of respondents reported knowledge of the hepatitis B vaccine, while 45.5% (66) had no knowledge of vaccine availability. Overall, the results suggest that although general awareness of hepatitis B and C among antenatal women was good, significant gaps remain, particularly regarding hepatitis C, vertical transmission, and vaccination. These gaps highlight the need for strengthened antenatal health education and targeted awareness campaigns to improve maternal knowledge and reduce the risk of transmission.

The relatively high awareness of hepatitis B observed in this study (75.2%) is consistent with findings from studies in Nigeria and other sub-Saharan African countries, where hepatitis B awareness among pregnant women ranged from 60–85%, largely due to increasing public health campaigns and routine antenatal screening (Aba & Aminu, 2016; Adekanle *et al.*, 2015). However, the lower awareness of hepatitis C (58.6%) aligns with

previous reports showing that hepatitis C remains less recognised because it receives less public health attention and lacks widespread routine screening programmes (World Health Organization [WHO], 2024). The moderate awareness of mother-to-child transmission (66.9%) is encouraging but remains inadequate, as vertical transmission is a major contributor to chronic hepatitis infection in endemic regions. Similar knowledge gaps were reported by the World Health Organization (2024), which identified poor maternal understanding of transmission routes as a barrier to hepatitis elimination efforts. Awareness of hepatitis B vaccination (54.5%) was also suboptimal, comparable to findings by Ndako *et al.* (2012), who reported limited vaccine knowledge among pregnant women in northern Nigeria. These findings suggest that although antenatal attendees demonstrate moderate awareness, targeted educational interventions during antenatal visits are still necessary. Strengthening health talks, integrating viral hepatitis education into routine antenatal services, and improving community sensitisation could significantly enhance prevention and reduce mother-to-child transmission.

Table 3 shows that health workers were the major source of information on hepatitis B/C among respondents (46.9%), followed by the media (29.7%), while family (6.9%) and other sources (2.8%) contributed minimally, highlighting the important role of healthcare professionals in disseminating hepatitis-related information. The predominance of health workers as information sources agrees with previous Nigerian studies emphasising antenatal clinics as key avenues for maternal health education (Ndako *et al.*, 2012). Media contribution further supports its public health role, although stronger community-based education is needed to improve wider hepatitis awareness (World Health Organization [WHO], 2024).

Most respondents identified blood transfusion (42.8%) as a transmission route of hepatitis B/C, while 31.7% lacked knowledge, indicating substantial gaps in understanding transmission pathways. The predominance of blood as the recognised transmission route agrees with previous Nigerian studies reporting better awareness of blood-borne transmission than other routes (Adekanle *et al.*, 2015). However, the high proportion of respondents lacking knowledge (31.7%) highlights persistent educational gaps, especially regarding vertical and body-fluid transmission, underscoring the need for enhanced antenatal counselling and targeted public health education (World Health Organization [WHO], 2024).

Moderate correct knowledge (52.4%) suggests fair awareness, but substantial uncertainty persists. Similar findings in Nigerian studies emphasise strengthening antenatal education to improve hepatitis transmission knowledge and preventive practices (Adekanle *et al.*, 2015; Ndako *et al.*, 2012).

The relatively low prevalence of HBV suggests limited exposure among respondents; however, notable proportions reported unsafe sexual behaviour and needle sharing, known contributors to hepatitis transmission. Similar studies in Nigeria identified these behaviours as significant predictors of hepatitis infection, reinforcing the need for continuous antenatal risk assessment and preventive counselling (Aba & Aminu, 2016; Ndako *et al.*, 2012; World Health Organization [WHO], 2024).

Despite high recognition of the importance of vaccination (77.9%), low prior testing and poor hepatitis B vaccine uptake indicate significant preventive gaps among respondents. Similar Nigerian studies reported inadequate adult vaccination coverage despite reasonable awareness, emphasising the need to integrate routine hepatitis screening and immunisation into antenatal care services (Adekanle *et al.*, 2015; Eleje *et al.*, 2021).

The findings demonstrate a significant association between hepatitis B awareness and vaccine uptake ($p = 0.044$), suggesting that awareness positively influences preventive behaviour. However, no significant association existed between age and awareness ($p = 0.739$), indicating that awareness was relatively uniform across age groups. The low HBV prevalence (2.8%) and absence of HCV positivity align with similar Nigerian antenatal studies reporting low-to-moderate seroprevalence among screened pregnant women (Aba & Aminu, 2016; Eleje *et al.*, 2021).

4. Conclusion

This study found moderate awareness of viral hepatitis B and C among pregnant women attending the antenatal clinic at Federal Medical Centre, Asaba, but identified important gaps in knowledge, previous screening, and

hepatitis B vaccination uptake. Awareness of hepatitis B was higher than that of hepatitis C, and just over half of the participants demonstrated correct knowledge of transmission modes. Although most participants recognised the importance of hepatitis B vaccination, only a small proportion had received the vaccine. Hepatitis B surface antigen was detected in 2.8% of participants, whereas no participant tested positive for hepatitis C. Awareness of hepatitis B was significantly associated with vaccination uptake, while age was not significantly associated with awareness. These findings support the need to strengthen hepatitis-focused health education during routine antenatal care, improve opportunities for screening, and promote hepatitis B vaccination among eligible women. Such measures should remain integrated with existing antenatal preventive services and should be implemented without overstating the findings beyond the hospital population studied.

5. Limitations

This hospital-based cross-sectional study was conducted in a single tertiary facility and included 145 antenatal attendees; therefore, the findings may not represent all pregnant women in Asaba or other settings. Awareness, knowledge, and risk-factor information were obtained through participant responses and may be affected by recall or reporting bias. The cross-sectional design also limits interpretation of temporal relationships. The prevalence estimates reflect screening results obtained during the study period and should therefore be interpreted within the characteristics of the enrolled antenatal population.

Consent

All authors declare that written informed consent was obtained from the patient (or other approved parties) for this piece of work.

Ethical Approval

Ethical approval for this study was obtained from the Ethics Committee of Federal Medical Centre, Asaba ((FMC/ASB/A81 VOL. X11/433) prior to commencement of the study.

Confidentiality of participants' information was maintained throughout the study, and no identifying personal data was included in the dataset used for analysis.

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Declaration of AI Use

This manuscript was prepared through the intellectual contributions of the author(s) to the study design, data analysis, interpretation of results, and scholarly content. Grammarly and ChatGPT were used solely to assist with grammatical refinement and reference formatting during manuscript revision. The author(s) accept full responsibility for the accuracy, integrity, and final content of the manuscript.

Competing Interests

Authors have declared that no competing interests exist.

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