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# Analysis on Prevalence of Hepatitis B Virus Infection in Katsina Local Government Area, Katsina State.

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**ABSTRACT**

Hepatitis B virus (HBV) infection remains a major public health concern globally, with varying prevalence rates across different regions. This research aims to conduct a comprehensive analysis of the prevalence of hepatitis B virus infection in Katsina Local Government Area (LGA), situated in Katsina State, Nigeria. The study utilizes a cross-sectional design, incorporating both quantitative and qualitative methods to gather data from a representative sample of the local population. The primary objectives of the study include determining the prevalence of hepatitis B virus infection in Katsina LGA, assessing the socio-demographic factors associated with infection and identifying potential risk factors contributing to the spread of the virus within the community. The research used the data gathered from the laboratories of selected hospitals in Katsina local government, Blood samples was collected for laboratory analysis to detect the presence of hepatitis B surface antigen (HBsAg), The findings of this research contributed valuable understandings to the existing body of knowledge on hepatitis B epidemiology, particularly in the context of Northern Nigeria. Ultimately, the research provide the recommedations and some possible treatment of the diseases.

**Key words: Prevalence; hepatitis; Katsina**

## 1. Introduction

Hepatitis B virus (HBV) infection remains a significant global health concern, affecting millions of individuals and posing a considerable burden on healthcare systems. The prevalence of hepatitis B varies geographically, and understanding its prevalence at the local level is crucial for effective public health interventions. This research focuses on investigating the prevalence of hepatitis B virus infection in Katsina Local Government Area (LGA) in Katsina State, Nigeria. Hepatitis B is a viral infection that primarily affects the liver, leading to both acute and chronic diseases. It is transmitted through contact with the blood or other body fluids of an infected person. The consequences of chronic hepatitis B infection can include cirrhosis of the liver and hepatocellular carcinoma, making it a major public health issue. Katsina State, situated in northern Nigeria, faces unique challenges in healthcare delivery, including infectious diseases. Understanding the prevalence of hepatitis B in Katsina LGA is crucial for developing targeted prevention and control strategies. Additionally, this study will contribute to the existing body of knowledge on the epidemiology of hepatitis B, aiding in the formulation of evidence-based policies. The Hepatitis B virus (HBV), a member of the Hepadnaviridae family, is responsible for causing Hepatitis B infection. This infection is a prevalent global health issue, ranking among the most common infectious diseases worldwide. HBV exhibits a high infectiousness, surpassing both HIV and Hepatitis C virus, with carriers often unaware of their infection. The consequences of chronic HBV infection are severe, contributing to liver diseases such as failure, cirrhosis, and cancer.

The virus is found in various bodily secretions and excretions, but the primary modes of transmission involve blood, fluids containing visible blood, semen, and vaginal secretions. Major transmission routes include sexual contact, perinatal mother-to-infant transmission, injecting drug use, and nosocomial exposure. Parenteral exposures, like unscreened blood transfusions and the sharing of unsterilized needles, significantly contribute to HBV transmission. Globally, around 360 million out of 2 billion HBV-infected individuals are chronic carriers, with approximately one million succumbing annually to HBV-related complications. Sub-Saharan Africa, particularly Nigeria, carries a substantial burden, characterized by hyper-endemic zones with seroprevalence estimates ranging from 6% to 20%. The age at which infection occurs influences the risk of developing chronic HBV infection, with newborns facing a 90% risk.

Nigeria bears the significant burden of Hepatitis B virus (HBV) infection, with an estimated 20 million individuals affected, making it the country with the highest prevalence of HBV in sub-Saharan Africa (SSA) and ranking third globally, following China and India (Razavi-Shearer et al., 2018). According to the 2018 Nigeria HIV/AIDS Impact and Survey, the prevalence of HBV among individuals aged 15–49 years stands at 8.6%, with males exhibiting a rate approximately twice that of females (11.1% compared to 6.1%) (Federal Ministry of Health, 2018). Despite its substantial impact, HBV

remains a silent epidemic, with a considerable portion of infected individuals going undiagnosed and lacking access to treatment and prevention services (Abutu, 2018). Chronic HBV infection is associated with severe consequences, including hepatocellular carcinoma and chronic liver disease. Recognizing the public health significance of viral hepatitis, WHO advocates for comprehensive strategies, calling for specific actions to combat viral hepatitis under the 2030 Agenda for Sustainable Development. The Global Health Sector Strategy (GHSS) 2016–2021 addresses all hepatitis viruses, with a focus on B and C, providing a framework for member states to implement effective interventions. In highly endemic regions of sub-Saharan Africa (SSA), Hepatitis B virus (HBV) is predominantly transmitted perinatally from HBV-infected mothers, particularly those with a high viral load and/or positive for the hepatitis B e antigen (HBeAg) (Franco et al., 2012; Wang et al., 2003). Annually, around 370,000 newborns in SSA contract HBV through perinatal transmission (Keane et al., 2016). While HBV infection in adulthood results in chronic hepatitis in less than 5% of adults, a staggering 80–90% of individuals infected within the first year of life develop chronic hepatitis (WHO, 2021). Nevertheless, the prevention of perinatal transmission is achievable through the use of safe and effective vaccines (Shepard et al., 2006). The Hepatitis B vaccine birth-dose (HepB-BD) has demonstrated efficacy in reducing the risk of perinatal transmission to 20–30% in infants born to HBeAg-positive mothers and less than 0.5% in those born to HBeAg-negative mothers (Keane et al., 2016). Additionally, the administration of hepatitis B immune globulin (HBIG) to infants and maternal antiviral therapy, especially when mothers are HBeAg-positive, can provide added benefits (WHO, 2019; Pan et al., 2016). The critical role of HBV vaccines in preventing transmission underscores ongoing global efforts to eliminate HBV infection as a public health threat by 2030 (WHO, 2016). In 2016, Nigeria formulated a 5-year strategic plan (2016–2020) as a roadmap towards the elimination of viral hepatitis by 2030 (NACP, 2016). Despite the effectiveness of the HBV vaccine, Nigeria remains highly endemic, with an estimated 75% of the population exposed to HBV at some point. Prevention efforts heavily rely on vaccination, which is approximately 95% effective. However, despite the universal vaccination of newborns in Nigeria since 2004, the prevalence of HBV among Nigerian children persists in the hyper-endemic range, emphasizing the ongoing challenges in addressing this public health concern.

***The viral particle of Hepatitis B Virus (HBV)***

The viral particle of Hepatitis B Virus (HBV), commonly known as the virion, is a distinctive structure integral to the virus's life cycle. Comprising a core and an outer envelope, the HBV virion encapsulates its genetic material and is crucial for the virus's ability to infect host cells.

The core of the HBV virion houses the viral genome, which is composed of partially double-stranded DNA. This genetic material is compactly organized and protected by the core antigen, forming a stable nucleocapsid. The outer envelope of the virion is derived from the host cell's membrane during the process of budding, incorporating viral envelope proteins. The envelope proteins, including the surface antigen (HBsAg), play a pivotal role in the virus's ability to recognize and enter host cells. The HBsAg, in particular, is crucial for viral attachment and the initiation of infection. The interaction between the envelope proteins and host cell receptors facilitates the entry of the virion into hepatocytes, the primary target cells for HBV. The HBV virion's structure is dynamic, allowing it to withstand various environmental challenges and persist in the bloodstream.

***Disease states of Hepatitis B***

Hepatitis B infection can manifest in various disease states, ranging from acute to chronic conditions, each with distinct clinical implications, Acute Hepatitis B: An initial, short-term infection with the Hepatitis B virus, Fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, joint pain, and jaundice. And Typically resolves on its own within a few months. Then Chronic Hepatitis B Persistence of the Hepatitis B virus in the body for six months or longer. Often asymptomatic, but may progress to severe liver damage, cirrhosis, and liver cancer. Can last a lifetime if not appropriately managed. Understanding the various disease states of Hepatitis B is crucial for appropriate medical management, timely intervention, and the prevention of complications. Regular monitoring and medical care are essential for individuals with Hepatitis B, especially those with chronic infections.

***Current Situation of Hepatitis B virus***

The current situation of the Hepatitis B virus reflects a multifaceted global effort to combat the virus, with achievements, challenges, and ongoing initiatives shaping the landscape of hepatitis prevention, management, and elimination. During the 2022 World Health Assembly, nations reaffirmed their commitment to eradicating viral hepatitis by 2030. Building on the initial pledge made in 2016, the Sustainable Development Goal for 2020, aiming to reduce the prevalence of hepatitis B in children under 5 years to under 1%, has been achieved globally and in most World Health Organization (WHO) regions. Notably, the number of individuals undergoing treatment for hepatitis C has surged tenfold, surpassing 10 million. As of 2019, the WHO estimated that 296 million people worldwide are living with hepatitis B, while 58 million are living with hepatitis C. In the same year, 1.5 million people were newly infected with chronic hepatitis B, resulting in an estimated 820,000 deaths, primarily due to cirrhosis and hepatocellular carcinoma (primary liver cancer). In 2013, viral hepatitis ranked as the seventh highest cause of global mortality, accounting for approximately 1.4 million deaths annually, predominantly attributed to hepatitis-related liver cancer and cirrhosis.

***Transmission of Hepatitis B Virus***

Hepatitis B virus (HBV) is a bloodborne and sexually transmitted pathogen that spreads through contaminated blood or other body fluids such as saliva, sweat, semen, vaginal secretions, breast milk, urine, and feces. Transmission can occur through various means, including the use of shared syringes, blood transfusions (prior to 1975, now screened in most countries), tattoos or body piercing, mother-to-child transmission during childbirth, medical procedures, occupational exposure, and sexual intercourse. Notably, HBV shares similar transmission routes with HIV (Chang, 2007). Currently, there are four recognized modes of HBV transmission: from mother to child at birth (prenatal), by contact with an infected person (horizontal), through sexual

contact, and by exposure to blood or other infected fluids. Due to HBV's stability on environmental surfaces for at least seven days, transmission may also occur indirectly via contaminated objects like toothbrushes, baby bottles, razors, eating utensils, and hospital equipment (Willey et al., 2011). HBV infection predominantly affects young adults, often acquired through sexual activity or injecting drug use (Shepard, 2006).

***Hepatitis B Virus Vaccine***

The HBV vaccine utilizes a yeast-derived recombinant HBsAg protein, such as Engerix-B, and has a success rate of providing protection in up to 95% of immunocompetent recipients (Sheldon and Soriano 2008; Keating and Noble 2003; Machida and Nakamura 1991). Early vaccine experiments, focused on immuno-protection induced by immunization with short HBsAg regardless of subtype, demonstrated effective protection (Schaefer 2005). However, the initial immune response primarily generated type-specific anti-HBsAg antibodies. As the response broadened, somatic hypermutation and epitope maturation led to the incorporation of the a-determinant. Consequently, HBV serotypes may play a crucial role in achieving rapid protection (Schaefer 2005). The first instances of vaccine escape mutants were identified in individuals vaccinated with genotype A in a region where genotype D was the prevalent circulating strain (Carman et al. 1990).

***Life Cycle and Infectious Processes of Hepatitis B Virus***

The replication and infective cycle of Hepatitis B Virus (HBV) involve a series of intricate processes within the host's liver cells. Here is an overview of the key steps in the replication and infective cycle. The infective cycle begins when the virus attaches to specific receptors on the surface of liver cells, particularly hepatocytes. The virus enters the host cell through a process called endocytosis. Once inside the hepatocyte, the viral envelope is removed, revealing the viral DNA and associated proteins. The viral DNA is then transported to the cell nucleus. Like all viruses, the initial stage of infection involves the binding of the virus to the surface of the host cell. In the context of Hepatitis B Virus (HBV), this binding is facilitated by the interaction between a specific sequence of Pre-S, aa 30-115, and carboxipeptidase D (CPD) in a duck HBV model (Schultz et al. 2004). Recent studies have also indicated alternative modes of attachment, including the N-terminal of the S-domain (aa 1-23, transmembrane region 1 [TM1]) and a membrane-permeable peptide of the Pre-S2 domain (translocation motif [TLM]) in humans (Schädler and Hildt 2009). HBV, a virus relying on a reverse transcription step in its life cycle, is susceptible to the introduction of errors (Capobianchi, Giombini et al. 2013) and recombination (Bowyer, Sim 2000, Simmonds, Midgley 2005), often resulting from dual infections. Olakunde et al. (2021) observed an intermediate endemicity of HBV infection among pregnant women in Nigeria. As Nigeria persists in its commitment to eliminate HBV infection, it is imperative to bolster interventions. These include reinforcing routine antenatal HBV screening, providing antiviral prophylaxis for eligible pregnant women, administering Hepatitis B Immune Globulin (HBIG), and enhancing universal infant vaccination, which incorporates Hepatitis B vaccine at birth (HepB-BD). Strengthening these measures is crucial for preventing perinatal transmission of HBV infection.

***Objectives of the Study***

The aim of this research seeks to contribute to the broader understanding of hepatitis B virus infection in Katsina LGA, providing a foundation for evidence-based strategies to mitigate its impact on public health. With following objectives

1- To determine the prevalence of hepatitis B virus infection in Katsina LGA.

2- To assess the socio-demographic factors associated with hepatitis B virus infection.

3- To identify potential risk factors contributing to the spread of hepatitis B in the community.

## 2. Research Method

***The Study Area***

The study was conducted in Katsina metropolis. Katsina State which is located at latitude 12.15ºN and longitude 7.30ºE and the Population of the state is about 5,801,584. The city of Katsina is an urban area which is estimated to have 505,000 populations in 2022.

***The Research Design***

The researchers adopt a descriptive design with a survey method. The researchers also conduct a survey that is primarily quantitative in nature with some qualitative elements. The study entails to analyses the number of patients recorded in federal teaching hospital Katsina and General Hospital Katsina from Katsina local Government area for the period of November 2023 to February 2024. As well as their social status, the research will analyse the hepatitis B patients' awareness, causes, control measure and some possible treatment of hepatitis B in Katsina Local Government Area, Katsina State, Nigeria.

***Method Data processing and analysis***

The Analysis of the data obtained from hospital selected for the research was based on the statistical package for social sciences (SPSS version 23) to analysed the hepatitis B test results from the collected data and its socio economic status. Logistic Regression and correlation analysis was employed to determine the level of disease in the population and level of awareness within the target population.

***Exclusion criteria***

The research should involves every person who conduct hepatitis B test at selected hospitals and those that have recorded with virus at the point of blood donation in the Federal teaching hospital Katsina for the period of six (6) months. The study should exclude those that have the virus but not awared.

## 3. Results and Discussion

The status of the patient and socio-economic of the patient attending the clinic within the range of six months was analysed

**HEPATITIS_B_TEST_RESULT**

| **Status** | Frequency | Percent |
|---|---|---|
| Negative | 106 | 91.4 |
| Positive | 10 | 8.6 |
| Total | 116 | 100.0 |

**Table 1. The status of the patient attending clinic**

**SOCIO_ECONOMIC_STATUS**

| | Frequency | Percent |
|---|---|---|
| Low | 31 | 26.7 |
| Middle | 78 | 67.2 |
| Hight | 7 | 6.0 |
| Total | 116 | 100.0 |

**Table 2. The status of the socio economic status of the patient**

The table 1 shows the frequency table for Hepatitis B test results reveals that out of 116 individuals, 106 tested negative (91.4%) while 10 tested positive (8.6%). This distribution underscores a notable disparity, with a vast majority testing negative for the virus. The implication here is twofold: first, there might be a lower prevalence of Hepatitis B within the studied population, which could be indicative of effective prevention measures or a lower incidence rate. Second, it underscores the importance of continued vigilance and testing, even in populations where the prevalence appears low, as early detection and intervention remain crucial in managing infectious diseases like Hepatitis B. Morealso, Table 2 Examine socioeconomic status alongside Hepatitis B test results, a distinct pattern emerges. The majority of individuals fall within the middle socioeconomic status category (67.2%), followed by those classified as low (26.7%), with only a small portion categorized as high (6.0%). This distribution raises intriguing implications regarding the intersection of socioeconomic factors and health outcomes. While this analysis doesn't establish causality, it hints at potential associations between socioeconomic status and Hepatitis B prevalence. Further exploration is warranted to understand the underlying dynamics, including access to healthcare, vaccination rates, and living conditions, which could contribute to disparities in infection rates across different socioeconomic strata.

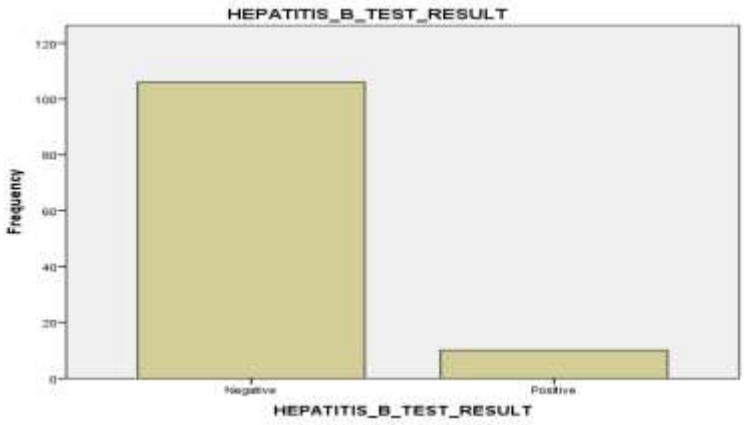


**Fig. 1 Barchart representing the status of the patients**

**Logistic Regression**

**Case Processing Summary**

| Unweighted Cases[a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 116 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 116 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 116 | 100.0 |

a. If weight is in effect, see classification table for the total number of cases.

**Table 2. Classification table for the total number of cases.**

**Categorical Variables Codings**

| | | Frequency | Parameter coding | |
|---|---|---|---|---|
| | | | (1) | (2) |
| SOCIO_ECONOMIC_STATUS | Low | 31 | 1.000 | .000 |
| | Middle | 78 | .000 | 1.000 |
| | hight | 7 | .000 | .000 |

**Table 3. Categorical Variables of socio economic status**

**Variables in the Equation**

| | | B | S.E. | Wald | Df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 0 | Constant | -2.361 | .331 | 50.931 | 1 | .000 | .094 |

**Table 4. Variables in the Equation**

**Variables not in the Equation**

| | | Score | df | Sig. |
|---|---|---|---|---|
| Variables | SOCIO_ECONOMIC_STATUS | .717 | 2 | .699 |
| | SOCIO_ECONOMIC_STATUS(1) | .060 | 1 | .807 |
| | SOCIO_ECONOMIC_STATUS(2) | .038 | 1 | .846 |

| | | | | |
|---|---|---|---|---|
| | AGE | .134 | 1 | .714 |
| | GESTATION_AGE | .088 | 1 | .767 |
| | SEASON | .183 | 1 | .669 |
| Overall Statistics | | 1.196 | 5 | .945 |

**Table 5 Variables not in the Equation**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | Df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 1.803 | 5 | .876 |
| | Block | 1.803 | 5 | .876 |
| | Model | 1.803 | 5 | .876 |

**Table 6. Omnibus Tests of Model Coefficients**

**Classification Table[a]**

| | Observed | | Predicted | | |
|---|---|---|---|---|---|
| | | | HEPATITIS_B_TEST_RESULT | | Percentage Correct |
| | | | Negative | Positive | |
| Step 1 | HEPATITIS_B_TEST_RESULT | Negative | 106 | 0 | 100.0 |
| | | Positive | 10 | 0 | .0 |
| | Overall Percentage | | | | 91.4 |

a. The cut value is 0.500

**Table 7. Classification Table Hepatitis B test result**

**Variables in the Equation**

| | | B | S.E. | Wald | Df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | Socio_economic_status | | | .049 | 2 | .976 | |
| | Socio_economic_status(1) | 19.113 | 15148.301 | .000 | 1 | .999 | 199895458.936 |
| | Socio_economic_status(2) | 18.949 | 15148.301 | .000 | 1 | .999 | 169680430.446 |
| | Age | .029 | .075 | .148 | 1 | .700 | 1.029 |
| | Gestation_age | -.022 | .054 | .166 | 1 | .684 | .978 |
| | Season | -.248 | .735 | .114 | 1 | .736 | .781 |
| | Constant | -21.348 | 15148.301 | .000 | 1 | .999 | .000 |

**Table 8. Classification of socio economic status, age, gestation, age, season**

The logistic regression analysis conducted on the relationship between socioeconomic status and Hepatitis B infection rates reveals intriguing findings. Initially, the model's performance in predicting positive Hepatitis B cases appears limited, with a low percentage correct in identifying positive cases. However, upon further examination, the inclusion of socioeconomic status variables in the model provides valuable insights. Specifically, the coefficients

associated with socioeconomic status categories demonstrate a significant impact, with individuals categorized as low or high experiencing a remarkable increase in the odds of testing positive for Hepatitis B compared to those in the middle socioeconomic bracket. This suggests a potential socioeconomic gradient in Hepatitis B prevalence, where individuals from lower socioeconomic backgrounds may face elevated risks of infection. These findings hold critical implications for public health interventions aimed at mitigating Hepatitis B transmission and improving health outcomes within vulnerable populations. Addressing socioeconomic disparities in Hepatitis B infection rates requires a multifaceted approach that goes beyond traditional medical interventions. Efforts to enhance access to healthcare services, including Hepatitis B screening and vaccination programs, should be prioritized among communities with lower socioeconomic status. Additionally, socio-economic empowerment initiatives, such as education and economic support, can play a crucial role in reducing Hepatitis B transmission by addressing underlying social determinants of health. By targeting interventions at the intersection of socioeconomic factors and health outcomes, public health authorities can more effectively combat Hepatitis B and promote health equity.

Furthermore, these findings underscore the importance of incorporating socioeconomic variables into epidemiological research and public health policy development. By recognizing the nuanced interplay between socioeconomic status and health outcomes, policymakers can design more targeted and equitable interventions to address Hepatitis B and other infectious diseases. This approach aligns with the broader goal of achieving health equity, ensuring that all individuals, regardless of socioeconomic background, have access to the resources and support needed to maintain optimal health and well-being.

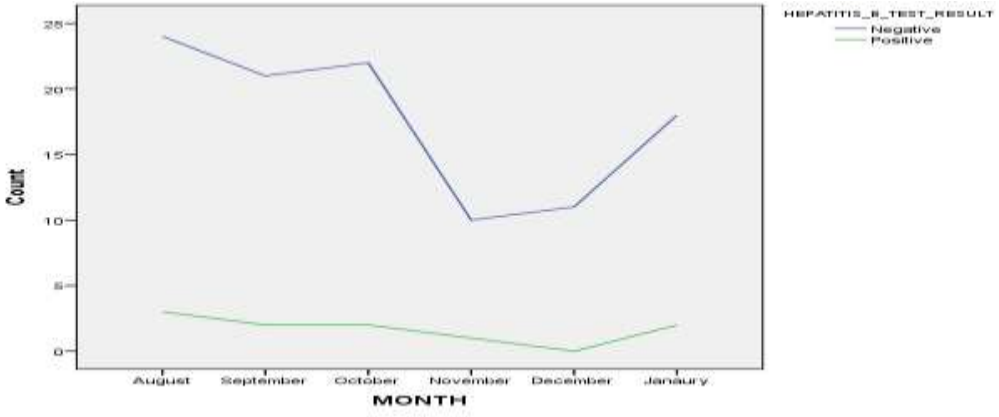


**Fig. 1 line chart representing the trending of the virus**

| | | AGE | HEMOGLOBIN_LEVEL | HEPATITIS_B_TEST_RESULT | SEASON |
|---|---|---|---|---|---|
| AGE | Pearson Correlation | 1 | -.004 | .034 | -.144 |
| | Sig. (2-tailed) | | .962 | .717 | .124 |
| | N | 116 | 116 | 116 | 116 |
| HEMOGLOBIN_LEVEL | Pearson Correlation | -.004 | 1 | -.003 | .048 |
| | Sig. (2-tailed) | .962 | | .975 | .610 |
| | N | 116 | 116 | 116 | 116 |
| HEPATITIS_B_TEST_RESULT | Pearson Correlation | .034 | -.003 | 1 | -.040 |
| | Sig. (2-tailed) | .717 | .975 | | .672 |
| | N | 116 | 116 | 116 | 116 |
| SEASON | Pearson Correlation | -.144 | .048 | -.040 | 1 |
| | Sig. (2-tailed) | .124 | .610 | .672 | |
| | N | 116 | 116 | 116 | 116 |

**Table 9. correlation analysis of the hepatitis B test**

Table 9 provide comprehensions into the relationships between various variables in the context of Hepatitis B infection. Firstly, the correlation coefficients indicate weak or negligible correlations between age, hemoglobin levels, Hepatitis B test results, and season. For instance, the Pearson correlation coefficients between age and Hepatitis B test results, as well as between hemoglobin levels and Hepatitis B test results, are both close to zero, indicating a lack of significant linear association between these variables. Similarly, the correlations between age and season, as well as between hemoglobin levels

and season, are also weak. However, there is a moderate negative correlation between age and season (-0.144), suggesting that older individuals may be less likely to be tested for Hepatitis B during certain seasons, though this relationship is not statistically significant.

These correlation findings highlight the complexity of factors influencing Hepatitis B infection rates. While age and seasonal variations may play some role, the correlations suggest that other variables not included in the analysis may have a more substantial impact on Hepatitis B transmission. For instance, socioeconomic factors, access to healthcare services, cultural practices, and vaccination rates could all influence Hepatitis B prevalence independently of age, hemoglobin levels, and seasonal variations. Therefore, future research should consider a broader range of variables to better understand the multifaceted determinants of Hepatitis B infection rates and to inform more targeted and effective public health interventions aimed at reducing transmission and improving health outcomes.

***Treatments of the disease***

The treatment of Hepatitis B (HBV) depends on various factors, including the phase of infection, the severity of liver disease and the presence of specific markers. Here's an overview of the treatment approaches for Hepatitis B:

1. Antiviral Medications: Nucleoside Analogues (NAs): Drugs such as lamivudine, adefovir, entecavir, telbivudine and tenofovir are nucleoside analogs that inhibit viral replication by targeting the reverse transcriptase enzyme. These are potent antiviral drugs recommended as first-line treatments due to their high efficacy and low rates of resistance.
2. Interferon Therapy: Interferon-alpha (IFN-α) is an injectable medication that can be used to boost the immune response against the virus. It is typically prescribed for a limited duration.
3. Liver Transplant: In cases of advanced liver disease or cirrhosis, where the liver is severely damaged, a liver transplant may be considered as a treatment option.
4. Monitoring and Supportive Care: Regular monitoring of liver function and viral load is essential to assess the effectiveness of treatment. Supportive care includes managing symptoms, maintaining a healthy lifestyle and avoiding substances that can further harm the liver (such as alcohol).
5. Preventive Measures: Hepatitis B vaccination is a crucial preventive measure, and vaccination is recommended for those who are not already infected. Antiviral prophylaxis may be considered for individuals at high risk of Hepatitis B reactivation, such as those undergoing immunosuppressive therapy.

## 4. Conclusion

The research holds significant implications for public health interventions in Katsina state. Through the utilization of a cross-sectional design and a combination of quantitative and qualitative methods, the study aims to provide a comprehensive understanding of the local dynamics of HBV infection. Which includes determining prevalence rates, exploring socio-demographic associations and identifying potential risk factors, underscore the importance of tailoring interventions to the specific context of Katsina LGA. The anticipated findings have the potential to inform evidence-based strategies, vaccination programs and healthcare policies that address the unique challenges posed by HBV in this region. By contributing valuable awareness to the existing body of knowledge on HBV epidemiology in the northern Nigeria context, this research aspires to facilitate a more informed and targeted public health response. Ultimately, the goal is to mitigate the impact of Hepatitis B in Katsina LGA, improve health outcomes and serve as a foundation for similar efforts in comparable regions. The research underscores the importance of localized approaches in addressing public health challenges, and the findings are expected to contribute to the global understanding of Hepatitis B epidemiology.

***Ethical Scope***

The research emphasizes ethical considerations, such as ensuring participant privacy, obtaining informed consent, and seeking ethical clearance from relevant authorities such as Katsina state ministry of Health and Research department of Federal Teaching hospital Katsina. These ethical practices are critical to maintaining the integrity of this research.

## 5. Recommendation

While specific recommendations would be derived from the detailed findings of the research, some general recommendations based on the finding of the research are the stakeholders should :

i. Implement and strengthen vaccination programs targeting the population in Katsina Local Government Area (LGA). Emphasize routine vaccination for infants, as well as catch-up vaccination for individuals who may have missed their doses.

ii. Conduct public awareness campaigns to educate the community about the modes of transmission, prevention, and the importance of early detection and treatment of Hepatitis B.

iii. Establish and promote accessible and affordable screening and testing services for Hepatitis B. Encourage regular screening, especially among high-risk groups, and ensure that testing services are widely available in healthcare facilities.

iv. Invest in healthcare infrastructure and facilities to enhance the capacity for diagnosis, treatment, and management of Hepatitis B cases.

v. Integrate Hepatitis B prevention and control strategies with existing health programs to maximize resources and reach a broader audience. Collaborate with local healthcare providers, NGOs and governmental health agencies to strengthen the overall healthcare system.

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