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Epidemiological Serosurvey of Hepatitis C Virus Infection Among Apparently Healthy Individuals in Jos North, Plateau State, Nigeria

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Abstract

Hepatitis C virus (HCV) infection poses a persistent global public health challenge due to its high transmissibility, potential for chronic progression, and association with severe hepatic complications such as liver cirrhosis and hepatocellular carcinoma (HCC). Despite its clinical relevance, HCV remains underdiagnosed and underreported in Jos North, Plateau State, Nigeria, where asymptomatic carriers often remain unaware of their infection status. This study aimed to determine the seroprevalence of HCV among apparently healthy individuals in Jos North and to identify associated sociodemographic and behavioural risk factors. Ethical approval was obtained from the Plateau State Ministry of Health. A total of 180 eligible participants were recruited, and venous blood samples (5 mL) were collected aseptically from the antecubital vein. Anti-HCV antibodies were screened using rapid immunochromatographic assay kits (Labtrust, UK) and confirmed using ELISA kits (Qingdao Hightop Biotech, China). Sociodemographic and risk factor data were collected via structured questionnaires. Statistical analysis was conducted using IBM SPSS version 27, with significance set at $p \leq 0.05$. Results showed a seroprevalence rate of 5.0% (9/180), with slightly higher prevalence in females (5.4%) than males (4.3%), although this difference was

not statistically significant (p = 0.524). The age group 51–65 years exhibited the highest prevalence (7.5%), followed by those aged 41–50 years (6.3%), with no significant association between age and HCV positivity (p = 0.731). The findings underscore the presence of silent HCV infection in the population and call for expanded screening, public health education, and the implementation of free routine testing in government health facilities to mitigate transmission and late-stage complications.

Keywords: Hepatitis C virus; Seroprevalence; Anti-HCV antibodies; Hepatocellular carcinoma; Jos North; ELISA screening

INTRODUCTION

Hepatitis C virus (HCV) is a spherical, enveloped, positive-sense, single-stranded RNA virus, approximately 55-65 nm in diameter, classified under the family *Flaviviridae*, genus *Hepacivirus* (CDC, 2024; Hedskog et al., 2019; Schoch et al., 2020; Shah et al., 2021; Smith et al., 2022). There are seven major HCV genotypes and 93 subtypes, with genotypes 1 and 3 being the most prevalent worldwide. HCV primarily targets hepatocytes, causing chronic hepatitis, liver cirrhosis, hepatocellular carcinoma (HCC), and potentially death (Duru et al., 2021; Michael & Maasoumy, 2022; Mawuli et al., 2022; Warner, 2023).

HCV infection is endemic globally and is ten times more infectious than HIV, with no available vaccine (Audu et al., 2020; WHO, 2024). It is a leading cause of end-stage liver disease and accounts for most liver transplant cases in developed countries (Audu et al., 2020;Nartey et al., 2023). Approximately 75-85% of HCV infections progress to chronic liver disease, with 10-20% of these cases developing liver cirrhosis within 20-30 years. Among those with cirrhosis, 1-5% may develop HCC (Agyeman et al., 2016; Usanga et al., 2020).

Globally, about 58 million people live with chronic HCV infection, including 9 million in Africa (Nartey et al., 2023; WHO, 2023). Among these, 3.2 million are children and adolescents, with an annual infection rate of about 1.5 million worldwide (Duru et al., 2021). The mortality rate due to HCV-related liver cirrhosis and HCC is approximately 399,000 per year (Nartey et al., 2023). HCV accounts for 27% of liver cirrhosis and 25% of HCC cases globally, making it the second leading cause of cancer death worldwide (Agyeman et al., 2016; Bartenschlager et al., 2018; Michael & Maasoumy, 2022).

The prevalence of HCV varies globally, with high rates in some developing countries, Eastern Europe, Africa, the Middle East, and Central Asia (CDC, 2024; WHO, 2023). In Nigeria, prevalence among specific groups ranges from 0.40% to 29.6% (Audu et al., 2020; FMOH, 2016; Okafor et al., 2020). However, data on prevalence among apparently healthy individuals in Jos-North, Plateau State, is limited.

HCV is a blood-borne pathogen transmitted through exposure to infected blood and blood products, unsafe injections, contaminated transfusions, injection drug use, sharing needles or sharps, sexual contact involving blood exposure, vertical transmission, and invasive procedures such as tattoos or tribal marks (Mawuli et al., 2022; WHO, 2023).

About 80% of infected individuals remain asymptomatic. Those with acute symptoms may experience fever, fatigue, nausea, abdominal pain, dark urine, pale stools, joint pain, and jaundice (Eleje et al., 2021; WHO, 2023). Acute infection refers to the first six months post-exposure, during which some clear the virus spontaneously, while others develop chronic infection lasting more than six months (Bastos et al., 2016). Chronic infection is often asymptomatic but can lead to cirrhosis, HCC, and death. Chronically infected individuals can transmit HCV even without symptoms (Mawuli et al., 2022).

HCV diagnosis involves serological and virological testing. Screening uses anti-HCV antibody assays (IgM & IgG), while confirmation depends on detecting HCV RNA in the blood (CDC, 2024; Li et al., 2015). Antibody tests cannot distinguish between past resolved and current infections; a positive HCV RNA test confirms active infection (Audu et al., 2020; CDC, 2024). Biochemical markers such as ALT, AST, ALP, albumin, and bilirubin assess liver function in infected individuals (El-Kady et al., 2017; Rana et al., 2020).Genotyping and quantifying HCV RNA are crucial for treatment decisions and prognosis. The seven genotypes differ in treatment response; for example, genotypes 1 and 4 are more resistant to interferon-based therapies than genotypes 2 and 3 (Hedskog et al., 2019; Li et al., 2015). This genetic diversity complicates vaccine development and allows the virus to evade immune responses and treatments (Messina et al., 2015; Shah et al., 2021).

Though no vaccine or post-exposure prophylaxis exists, HCV infection is preventable and treatable. Prevention relies on behavioral modifications such as adherence to universal precautions, safe handling of needles and sharps, safe blood transfusions, and avoiding sharing sharp objects (CDC, 2024; WHO, 2023). Antiviral treatments, including

glecaprevir/pibrentasvir, elbasvir/grazoprevir, ledipasvir/sofosbuvir, and others, can cure about 95% of infected persons if diagnosed and treated promptly (CDC, 2023; FMOH, 2016; Li et al., 2015; Nwagha et al., 2021; Shah et al., 2021; Warner, 2023; WHO, 2023).

Statement of the Problem

Hepatitis C Virus infection remains a major public health challenge globally due to its high likelihood of progressing to chronic liver disease and severe complications. Approximately 75-85% of HCV infections develop into chronic liver disease, with 10-20% progressing to liver cirrhosis, 1-5% advancing to hepatocellular carcinoma, and potentially resulting in death (Mawuli et al., 2022; Nartey et al., 2023; Ramírez & Castillo, 2021). Globally, an estimated 58 million people live with chronic HCV infection, with an annual mortality of about 399,000 and morbidity of approximately 1.5 million cases (Duru et al., 2021; WHO, 2023). In Africa, the prevalence is reported at 5.3%, with Sub-Saharan Africa bearing a significant burden (1.5-5.3%) and about 32 million infected individuals (Audu et al., 2020; WHO, 2023). Nigeria's HCV burden is poorly estimated due to limited data availability (FMOH, 2016).

Despite the availability of highly effective direct-acting antiviral (DAA) treatments capable of curing HCV, access to timely diagnosis remains limited in Nigeria, including Jos North, Plateau State. Barriers such as cost, limited healthcare access, low awareness, and stigma contribute to many individuals remaining undiagnosed or untreated, facilitating ongoing transmission and severe health outcomes. This study was therefore designed to determine the seroprevalence of HCV infection and identify associated risk factors among apparently healthy individuals in Jos North, Plateau State, Nigeria.

Purpose of the Study

The aim of this study was to determine the seroprevalence of HCV infection among apparently healthy individuals in Jos North, Plateau State, Nigeria.

Research Questions

To address the public health importance of HCV, this study sought to answer:

1. What is the seroprevalence of hepatitis C virus infection among apparently healthy individuals in Jos North, Plateau State?
2. What are the predisposing factors contributing to the spread of HCV infection among apparently healthy individuals in Jos North, Plateau State?

Objectives of the Study

The study objectives were:

1. To determine the seroprevalence of HCV infection among apparently healthy individuals in Jos North, Plateau State, using Rapid test kits and Biotech HCV ELISA Test Kits manufactured by Labtrust Diagnostic UK and Qingdao Hightop Biotech, China, respectively.
2. To identify risk factors associated with HCV infection in the study population.

Hypotheses

Null Hypothesis (H0): There is no significant difference in anti-HCV antibody prevalence among apparently healthy individuals in Jos North, Plateau State, Nigeria.

Alternative Hypothesis (H1): There is a significant difference in anti-HCV antibody prevalence among apparently healthy individuals in Jos North, Plateau State, Nigeria.

METHODOLOGY

A cross-sectional serosurvey design was employed, allowing data collection at a single point in time to estimate HCV seroprevalence and associated risk factors among apparently healthy individuals in Jos North, Plateau State. This design is cost-effective and provides valuable data for public health interventions.

The study targeted apparently healthy individuals aged 10-65 years, residing in Jos North, Plateau State, who were asymptomatic for HCV infection and willing to participate.

Sample Size Determination

The sample size was determined using the formula by Pourhoseingholi et al. (2013):

$$n = \frac{Z^2P(1-P)}{d2}$$

Where: Z = 1.96 (95% confidence level), P = 10.4% (prevalence from Onubi et al., 2023)

d = 0.05 (precision)

$$n = \frac{(1.96)^2 \times 0.104 \times (1-0.104)}{(0.05)^2} = 143.19$$

Accounting for attrition and to improve data quality, 25% was added adjusting the final sample size to 180 participants. A multistage sampling method was used: Three wards randomly selected from 14 wards in Jos North, Two communities randomly selected from each chosen ward and Simple random sampling of 30 participants from each community. This technique is cost-effective, reduces sampling errors, and allows generalization of findings with confidence.

Ethical approval was obtained from the Plateau State Ministry of Health ethics committee. Informed consent was secured from all participants. Confidentiality was maintained, and participants had the right to withdraw without penalty. Data handling complied with privacy regulations. Male and female participants aged 10-65 years, Residents of Jos North, Plateau State who are Asymptomatic for HCV or any known medical condition and provided informed consent. Residents of Jos North who declined consent, or showed symptoms suggestive of HCV or other health conditions, Known history of HCV infection or prior positive HCV test and Non-residents of Jos North

These include: Structured questionnaire for demographic and risk factor data collection, Rapid immunochromatographic assay kits (Labtrust Rapid Diagnostic UK), Enzyme-linked immunosorbent assay (ELISA) kits (Qingdao Hightop Biotech, China)., Biochemical test kits for liver function (Agappe Diagnostics Ltd, India). Demographic and risk factor data were collected via interviewer-administered structured questionnaires. Venous blood (5 mL) was aseptically collected from participants using sterile disposable needles into labeled plain containers. Blood samples were allowed to clot, centrifuged at 3000 rpm for 5 minutes, and serum was harvested for analysis. Samples were transported under cold chain conditions to Plateau State Human Virology Research Centre (PLASVIREC) for laboratory testing. Where immediate analysis was not possible, sera were stored at -20°C.

Screening: Anti-HCV antibodies were detected using Labtrust Rapid Diagnostic kits and ELISA kits from Qingdao Hightop Biotech, Biochemical Tests: Liver function tests were performed on positive samples using Agappe diagnostics kits to assess infection severity. Data were analyzed using IBM SPSS version 27. Descriptive statistics summarized demographic characteristics and HCV seroprevalence. Chi-square tests evaluated associations between risk factors and HCV positivity. Statistical significance was set at $p \leq 0.05$.

RESULTS

Table 1: Prevalence of Hepatitis C Virus Infection among the Study Population in Relation to Gender

Variables	Category	No. Tested	Rapid Test Positive (%)	ELISA Test Positive (%)	P- value
Gender	Male	69	3(4.3)	3(4.3)	P = 0.524
	Female	111	6(5.4)	6(5.4)	
	Total	**180**	**9(5.0)**	**9(5.0)**	

The study analysed 180 samples, of which 9(5.0%) tested positive for HCV using both rapid and ELISA test kits. Of these, 69 were male with a prevalence of 3(4.3%), while 111 were female with a prevalence of 6(5.4%). The statistical values $\chi^2 = 0.100$ and $p = 0.524$ are reported in Table 1.

Table 2: Prevalence of Hepatitis C Virus Infection in Jos North in Relation to Age group

Variables	Category	No. Tested	Rapid Test Positive (%)	ELISA Test Positive (%)	P- value
Age Group	10-20	3	0(0.0)	0(0.0)	P = 0.731
	21-30	40	2(5.0)	2(5.0)	
	31-40	52	1(1.9)	1(1.9)	
	41-50	32	2(6.3)	2(6.3)	
	51-65	53	4(7.5)	4(7.5)	
	Total	**180**	**9(5.0)**	**9(5.0)**	

The result in table 2 indicates the distribution of HCV Infection among apparently Healthy Individuals in Jos-North area of Plateau State in relation to age groups.

Table 3: Prevalence of Hepatitis C Virus Infection in Jos North in relation to Potential Risk Factors

Variables	Category	No. Tested	Rapid Test Positive (%)	ELISA Test Positive (%)	P –Value
Multiple Sexual partners	Yes	30	7(23.3)	7(23.3)	P = 0.000
	No	150	2(1.3)	2(1.3)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
History of Blood Transfusion	Yes	19	1(5.3)	1(5.3)	P = 0.956
	No	161	8(5.0)	8(5.0)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Tattoo/body piercing/ Tribal Marks	Yes	38	6(15.8)	6(15.8)	P = 0.001
	No	142	3(2.1)	3(2.1)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Surgery/Invasive Procedures	Yes	32	2(6.3)	2(6.3)	P = 0.720
	No	148	7(4.7)	7(4.7)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Sharing of Sharp objects	Yes	56	7(12.5)	7(12.5)	P = 0.002
	No	124	2(1.6)	2(1.6)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
History of Hospitalization	Yes	25	1(4.0)	1(4.0)	*P = 0.805*
	No	155	8(5.2)	8(5.2)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Family history of HCV	Yes	23	1(4.3)	1(4.3)	P = 0.878
	No	157	8(5.1)	8(5.1)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Awareness of HCV Infection	Yes	63	2(3.2)	2(3.2)	P = 0.410
	No	117	7(6.0)	7(6.0)	
	Total	**180**	**9(5.0)**	**9(5.0)**	
Intravenous drug use	Yes	1	0(0.0)	0(0.0)	P = 0.818
	No	179	9(5.0)	9(5.0)	
	Total	**180**	**9(5.0)**	**9(5.0)**	

The distribution of HCV Infection among apparently Healthy Individuals in Jos-North area of Plateau State in relation to potential risk factors is shown in Table 3. Multiple sex partners revealed that participants with multiple sex partners (30) had a prevalence of 7(23.3%), while those without multiple sex partners (150) had a prevalence of 2(1.3%). The

statistical values were $\chi^2 = 25.474$ and $p < 0.001$. History of blood transfusion showed that participants with the history of blood transfusion (19) had a prevalence of 1(5.3%), while those without the history of blood transfusion (161) had a prevalence of 8(5.0%). The statistical values were $\chi^2 = 0.003$ and $p = 0.956$. History of tattoo/body piercing/tribal marks revealed that participants with tattoo/body piercing/tribal mark (38) had higher prevalence of 6(15.8%) while those without the tattoo/body piercing/tribal marks (142) had 3(2.1%) prevalence. The statistical values were $\chi^2 = 11.805$ and $p < 0.001$. History of surgery/invasive procedures individuals with the history of surgery (32) had a prevalence of 2(6.3%), while those without the history of surgery/invasive procedures (148) had a prevalence of 7(4.7). The statistical values were $\chi^2 = 0.128$ and $p = 0.720$. History of hospitalization indicated that participants without the history of hospitalization (86) had a prevalence of 3(3.5%), while those with the history of hospitalization (94) had a prevalence of 6(6.4%). The statistical values were $\chi^2 = 0.792$ and $p = 0.373$. Habit of sharing of sharp objects showed that individuals who shared sharp objects (56) had a higher prevalence of 7(12.5%), while 2(1.3%) HCV prevalence was recorded among participants that do not practice the habit of sharing sharp objects (124). The statistical values were $\chi^2 = 9.626$ and $p < 0.002$. Family history of HCV infection indicates that a prevalence of 1(4.3%) was observed in those with a history of HCV infection (23), while 8(5.1%) was seen in those without a history of HCV infection (157). The statistical values were $\chi^2 = 0.024$ and $p = 0.878$. Awareness of HCV infection revealed that a prevalence of 2(3.2%) was found in those who were aware (63) of the HCV infection, while 7(6.0%) prevalence was recorded in those who were not aware (117) of the HCV infection. The statistical values were $\chi^2 = 0.680$ and $p = 0.410$. History of intravenous drug use showed that Individuals with a habit of intravenous drug use (0) had a prevalence of 0(0.0%), while those without the habit (180) had a prevalence of 9(5.0%). The statistical values were $\chi^2 = 0.053$ and $p = 0.818$.

Table 4: Comparison of HCV Prevalence across Geographical Wards in Jos North
(Positive Rapid Tests results for anti-HCV antibodies confirmed Positive by ELISA kits)

Category	Number Tested	HCV Rapid Test (%)		ELISA Test (%)		P- Value
		Negative	Positive	Negative	Positive	
Janta Adamu Ward	60	55(91.7)	5(8.3)	55(91.7)	5(8.3)	P = 0.349
Jos Jarawa Ward	60	58(96.7)	2(3.3)	58(96.7)	2(3.3)	
Tudun Wada Kabong Ward	60	58(96.7)	2(3.3)	58(96.7)	2(3.3)	
Total	**180**	**171(95.0)**	**9(5.0)**	**171(95.0)**	**9(5.0)**	

Table 4 shows the HCV distribution in relation to the location of sample collection. The highest prevalence of 8.3% was recorded in Jentan Adamu Ward, followed by 3.3% in both Tudun Wada/Kabong Ward and Jos Jarawa Ward. $\chi^2 = 2.105$, $p = 0.349$.

Findings of the Study

1. The study found 9(5.0%) seroprevalence of hepatitis C virus infection among apparently healthy individuals in Jos North area of Plateau State, Nigeria. Indicating Jos North as an HCV endemic area, with the majority of infected individuals unaware of their status.
2. The prevalence was higher among females 6(5.4%) compared to males 3(4.3%), and the rate of infection increased with age, with the highest prevalence observed among individuals of ages 51-65 4(7.5%), and ages 41-50 2(6.3%) while the lowest was among ages 31-40 1(1.9%).
3. Significant risk factors included multiple sexual partners (23.3% vs 13.0%, ($p < 0.001$), habit of sharing sharp objects (12.5% vs 1.6%, ($p < 0.002$), and history of tattoos/body piercings/tribal marks (15.8% vs 2.1%, $p < 0.001$).
4. Location Variance: The highest prevalence of HCV was recorded in Jentan Adamu Ward 5(8.3%) compare to the 3.3% HCV prevalence recorded in both Tudun Wada/Kabong, and Jos Jarawa Wards.

DISCUSSION

This study identified a 5.0% seroprevalence of hepatitis C virus (HCV) infection among apparently healthy individuals in Jos North, Plateau State, Nigeria. This prevalence aligns closely with previous reports some regions in Nigeria, such as 4.9% among blood donors in Jos-South (Adekeye et al., 2013), 4.8% among pregnant women in Nasarawa State (Innocent et al., 2022), 6.3% among mortuary workers and ambulance drivers in Jos (Uruku et al., 2018), and 4.6% among pregnant women in Akwa Ibom State (Shittu et al., 2023). The consistency of these findings suggests common risk factors and transmission dynamics within the region, compounded by limited comprehensive screening efforts due to shifting public health priorities towards other infections like HIV.

Conversely, this study's prevalence is significantly lower than several earlier reports from Nigeria, which ranged from 6.0% to as high as 29.6% in high-risk groups such as rural communities (Ramyil et al., 2014), healthcare seekers (Uchendu et al., 2019; Onubi et al., 2023), prison inmates (Okafor et al., 2020; Owoseni et al., 2024), and diabetic patients (Ndako et al., 2020). The decline in prevalence compared to these studies may be explained by differences in study populations (apparently healthy individuals versus high-risk groups), geographical variation, improved screening and prevention measures, and possible false-positive results in earlier serological testing within resource-limited settings.

However, the 5.0% prevalence is higher than some other Nigerian studies reporting rates below 3.5%, such as among pregnant women in Kogi State (Omatola et al., 2019), adults screened in Lagos (Oshun et al., 2019), and rural communities in Bauchi State (Alkali et al., 2023). These variations may reflect differences in demographic characteristics, regional epidemiology, and testing sensitivity. Compared internationally, the prevalence here is higher than the 1.02% reported among healthcare personnel in Mexico City (Ramírez & Castillo, 2021), underscoring regional disparities influenced by socio-economic, healthcare infrastructure, and epidemiological factors.

Gender Distribution

The study found a higher HCV prevalence among females (5.4%) than males (4.3%), although this difference was not statistically significant ($p = 0.524$). This trend is consistent with other Nigerian studies (Ndako et al., 2020; Uchendu et al., 2019; Duru et al., 2021; Usanga et al., 2020). Potential explanations include greater female exposure to risk factors such as unsafe injections or blood transfusions, biological susceptibility possibly

linked to hormonal or immune differences, higher health-seeking behavior among females leading to increased detection, and sampling bias due to a higher number of female participants.

Age Distribution

HCV prevalence increased with age, peaking at 7.5% among individuals aged 51-65 years, followed by 6.3% in the 41-50 years group, and 5.0% in the 21-30 years group, though differences were not statistically significant ($p = 0.731$). This pattern aligns with findings by Onubi et al. (2023), suggesting cumulative lifetime exposure, age-related immune decline reducing viral clearance, and cohort effects reflecting historical exposure risks contribute to higher prevalence in older populations.

Educational Status

Although not statistically significant ($p = 0.717$), those with primary education had the highest HCV positivity (7.5%), followed by informal education (7.1%), secondary education (4.9%), and tertiary education (2.3%). This trend mirrors reports by Duru et al. (2021), Oti et al. (2021), and others, possibly reflecting disparities in health literacy, access to healthcare, occupational exposures, and behavioral risk factors.

Sexual Behavior: Multiple Sexual Partners

Participants with multiple sexual partners or in polygamous relationships had significantly higher HCV prevalence (23.3%) compared to those without (13.0%, $p = 0.000$). This supports findings by Oti et al. (2021), and Ukuru et al. (2018), though it contrasts with some studies reporting higher prevalence among monogamous individuals (Ndako et al., 2020; Okafor et al., 2020). The elevated risk is likely due to increased exposure to infected blood or bodily fluids, high-risk sexual practices, and cultural factors influencing transmission dynamics, emphasizing the need for targeted behavioral interventions.

History of Hospitalization and Blood Transfusion

Participants with a history of hospitalization had a higher HCV prevalence (6.4%) than those without (3.5%), though not statistically significant ($p = 0.373$). Similarly, those with prior blood transfusions had a slightly higher prevalence (5.3%) compared to those without (5.0%, $p = 0.956$). These findings align with prior research (Oti et al., 2021; Ndako et al., 2020; Duru et al., 2021) and highlight the ongoing risk posed by healthcare-associated

exposures, particularly in settings with suboptimal infection control and blood screening practices. The World Health Organization (2024) stresses the importance of rigorous screening of all blood donations to prevent HCV transmission.

Sharing of Sharp Objects

A significantly higher HCV prevalence was observed among participants who shared sharp objects (12.5%) compared to those who did not (1.6%, $p = 0.002$). This finding is consistent with Okafor et al. (2020) and Eleje et al. (2021), but contrasts with Ndako et al. (2020) and Duru et al. (2021). The elevated prevalence is likely due to direct blood-to-blood transmission, frequent sharing behavior, and socio-cultural practices, underscoring the need for education and intervention targeting this risk factor.

Tattooing, Body Piercing, and Tribal Marks

Participants with tattoos, body piercings, or tribal marks had a significantly higher HCV prevalence (15.8%) compared to those without (2.1%, $p = 0.001$). This concurs with Duru et al. (2021) but contrasts with other studies (Oti et al., 2021; Okafor et al., 2020; Eleje et al., 2021). Contaminated equipment due to inadequate sterilization is a recognized risk (WHO, 2018), highlighting the importance of safe practices and regulation in these cultural and cosmetic procedures.

Family History of HCV Infection

No significant association was found between family history of HCV and infection prevalence (4.3% with family history vs. 5.1% without, $p = 0.878$). Similar findings were reported by Ndako et al. (2020) and Iduh et al. (2018). The slightly lower prevalence among those with family history may reflect increased awareness and early testing, though further research is needed.

Intravenous Drug Use

Unexpectedly, no HCV cases were detected among participants reporting intravenous drug use, while a 5.0% prevalence was observed among non-users ($p = 0.818$). This aligns with Eleje et al. (2021) and Duru et al. (2021), possibly due to underreporting, small sample size, selection bias, or successful harm reduction programs. This finding calls for further investigation into the role of intravenous drug use in HCV transmission in this population.

Geographical Distribution

HCV prevalence varied by location within Jos North but was not statistically significant ($p = 0.349$). The highest prevalence was in Jentan Adamu Ward (8.3%), with lower rates in Tudun Wada/Kabong and Jos Jarawa Wards (3.3% each). Variations likely reflect a complex interplay of geographic, socioeconomic, demographic, marital, and occupational factors. Targeted interventions in high-prevalence areas are essential for effective HCV control and elimination.

CONCLUSION

This study identified a 5.0% prevalence of hepatitis C virus (HCV) infection among apparently healthy individuals in Jos North, Plateau State, underscoring the area as a potential HCV endemic zone. The finding that most infected individuals were unaware of their status highlights a critical gap in public health awareness and access to diagnostic services. By examining associations between HCV infection, risk behaviours, and motivations for testing, the study offers important insights into the behavioural and systemic factors contributing to the silent spread of HCV in the region.

These findings contribute to the broader public health discourse by providing current, population-specific data essential for shaping effective HCV elimination strategies in Nigeria. The study also supports global hepatitis elimination targets by drawing attention to the need for routine screening, increased public education, and accessible treatment pathways. Its contributions are both practical and policy-relevant, particularly for regional health authorities and national hepatitis control programs.

In addressing a significant knowledge gap on HCV prevalence and awareness in Jos North, this study reaffirms the importance of localized epidemiological surveillance in informing public health interventions. Continued research into HCV prevalence among diverse sub-populations across Nigeria will be essential to developing comprehensive, equitable, and effective responses to viral hepatitis.

Recommendations

1. Public Sensitization Campaigns: Intensive public sensitization campaigns are essential to educate the community on HCV transmission routes, prevention, and control measures in Jos North and Plateau State.

2. Government Subsidies: Government subsidies for the diagnosis and treatment of HCV in all government hospitals and primary health centres in the state are crucial, similar to the approach taken for HIV. Given that HCV is ten times more infectious than HIV, an increasing number of HCV-positive individuals could negatively impact community productivity and efficiency.
3. Strengthening Awareness Efforts: Strengthening awareness efforts is paramount. Health education on the prevention, transmission, and awareness of viral hepatic diseases should be intensified through various channels such as television, radio, newspapers, the internet, and other available platforms.

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