THE PREVALENCE OF HEPATITIS B AND C VIRUS INFECTION AMONG CLINIC PATIENTS AT THE FEDERAL POLYTECHNIC, MUBI, ADAMAWA STATE

BY

JOHN LAMECK
ST/PT/ND/23/006

ABUBAKAR UMAR
ST/PT/ND/23/014

JOHN MARY
ST/PT/ND/23/021

ISHAKU NOLYNE
ST/PT/ND/23/028

DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY,
SCHOOL OF SCIENCE AND TECHNOLOGY,
FEDERAL POLYTECHNIC, MUBI, ADAMAWA STATE.

AUGUST, 2025

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF BIOMEDICAL AND PHARMACEUTICAL TECHNOLOGY, SCHOOL OF APPLIED SCIENCE, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN PHARMACEUTICAL TECHNOLOGY, THE FEDERAL POLYTECHNIC, MUBI, ADAMAWA STATE

AUGUST, 2025

DECLARATION

We hereby declare that this work which titled "The Prevalence of Hepatitis B And C Virus Infection Among Clinic Patients at the Federal Polytechnic, Mubi, Adamawa State". As a result of research effort and findings and to the best of our knowledge and belief that this work has never been submitted to any institution for the award of any certificate and various sources used has been duly acknowledged by the use of referencing.

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JOHN LAMECK Date
ST/PT/ND/23/006

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……..……..... ……..…….....
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ST/PT/ND/23/028

CERTIFICATION

This project entitled “The Prevalence of Hepatitis B And C Virus Infection Among Clinic Patients at the Federal Polytechnic, Mubi, Adamawa State” meets the regulation governing the award of National Diploma in Pharmaceutical Technology of the Federal Polytechnic, Mubi and is approved for its contribution to knowledge and literary presentation.

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Mr. Caleb Nina Date

(Project Supervisor)

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Dr. Mahmoud Mohammed Tanko Date

(Head of Department)

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(External Examiner) Date

DEDICATION

We dedicated this research work to God almighty for his infinite love and mercy upon us and also for giving us sound knowledge, wisdom and better understanding to successfully write this piece of project and to him be all the glory and honor.

ACKNOWLEDGEMENTS

We want to acknowledge Almighty God for his infinite mercy and protection throughout our academic activities. And for the understanding in achieving our academic success.

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CHAPTER ONE
INTRODUCTION

This chapter introduces the study by presenting the background and the context of Hepatitis B and C virus infections as global and national public health concerns. It outlines the statement of the problem, highlighting the lack of region-specific data and the burden of infection in semi-urban areas like Mubi. The chapter also defines the aim and specific objectives of the research, along with the scope, significance, and operational definitions that guide the entire study.

1.1. Background of the Study

Hepatitis B and C are two major viral infections that primarily affect the liver, causing acute and chronic illnesses. These infections remain a significant cause of morbidity and mortality worldwide. Hepatitis B virus (HBV) is known to cause both acute and chronic hepatitis, leading to severe liver complications such as cirrhosis, liver failure, and hepatocellular carcinoma (Liaw & Wu, 2015). Similarly, Hepatitis C virus (HCV) is a leading cause of chronic liver disease globally and can progress to cirrhosis and liver cancer if left untreated (Perz et al., 2006). While Hepatitis B can be prevented through vaccination, no vaccine exists for Hepatitis C, although direct-acting antiviral therapies have significantly improved outcomes for patients with HCV infections (Gane et al., 2018). In sub-Saharan Africa, including Nigeria, the prevalence of both HBV and HCV remains alarmingly high, and the region continues to bear a large share of the global burden of liver diseases (Sow et al., 2017).

Nigeria, as the most populous country in Africa, has seen a rising burden of hepatitis infections, with numerous studies showing high rates of HBV and HCV among its population (Musa et al., 2017). Although the national healthcare system provides some resources for the management of these infections, there remains a critical gap in awareness, screening, and prevention, especially in rural and semi-urban areas. The Federal Polytechnic Mubi, located in

Adamawa State, is home to a significant population of students, faculty, and staff who may be at risk of contracting these viral infections. This study aims to examine the prevalence of Hepatitis B and C infections among clinic patients at the Federal Polytechnic Mubi and to explore the socio-demographic and behavioural factors that may contribute to the spread of these infections in this local context.

Viral hepatitis remains one of the leading causes of liver-related morbidity and mortality worldwide, with Hepatitis B affecting an estimated 257 million people and Hepatitis C affecting approximately 71 million people globally (World Health Organization [WHO], 2021). In sub-Saharan Africa, HBV is endemic, with a high prevalence due to factors such as poor sanitation, unsafe healthcare practices, and limited access to vaccines (Ojo et al., 2020). Hepatitis C, on the other hand, is largely associated with intravenous drug use, unsterile medical procedures, and sexual transmission, with rates also high in some sub-Saharan African countries (Baggio et al., 2018).

Nigeria, specifically, faces significant challenges in controlling the spread of Hepatitis B and C. A study by Agaba et al. (2020) found that the prevalence of HBV in Nigeria was estimated to be around 11% in the general population, while HCV prevalence stands at approximately 2.9%. Despite the availability of screening and preventive measures for HBV, such as vaccination, and the introduction of antiviral therapies for HCV, awareness and access to healthcare services remain limited in many regions. The Federal Polytechnic Mubi, located in the northeastern part of Nigeria, serves as a critical institution for students from various backgrounds. Given the diverse demographic of the population, this study is particularly important in providing insights into the local burden of viral hepatitis and the associated risks in an academic setting.

1.2. Statement of the Problem

Hepatitis B and C infections represent a major public health challenge in Nigeria, with high prevalence rates and widespread unawareness of the risks and modes of transmission. The lack of comprehensive, region-specific data on the prevalence of these infections in various localities, particularly in semi-urban and rural areas like Mubi, has led to inadequate health interventions and poor targeting of resources. There is an urgent need to determine the prevalence of Hepatitis B and C among patients attending the clinic at the Federal Polytechnic Mubi, as this will offer a more localized understanding of the extent of the problem. Given the increasing burden of liver diseases and the potential for transmission through various routes, it is vital to explore the factors contributing to the persistence of Hepatitis B and C infections in this population.

1.3. Aim and Objectives

1.3.1. Aim

The primary aim of this study is to determine the prevalence of Hepatitis B and C virus infections among clinic patients at the Federal Polytechnic Mubi, Adamawa State, Nigeria, and to identify associated risk factors.

1.3.2. Objectives

i. To determine the overall prevalence of Hepatitis B and C infections among clinic patients at the Federal Polytechnic Mubi.

ii. To identify demographic, behavioural, and socio-economic factors associated with an increased risk of Hepatitis B and C infections in the study population.

iii. To recommend strategies for the improvement of screening, vaccination, and public health education programs aimed at reducing the prevalence of Hepatitis B and C in the region.

1.4. Significance of the Study

This study holds significant public health importance as it will provide valuable, localized data on the prevalence of Hepatitis B and C infections among clinic patients at the Federal Polytechnic Mubi. The findings will contribute to filling the gap in hepatitis-related data specific to the northeastern region of Nigeria, thereby enhancing the understanding of the virus distribution in this area. The study will also identify key risk factors that could inform more targeted prevention and treatment efforts. Additionally, the results of this study will be important for healthcare policymakers, local health authorities, and educational institutions in developing effective strategies for combating viral hepatitis, improving screening access, and increasing public awareness about the risks and preventive measures.

1.5. Scope of the Study

The scope of this study will be limited to clinic patients at the Federal Polytechnic Mubi, Adamawa State, Nigeria. The research will be conducted using a cross-sectional design, wherein blood samples will be collected from patients attending the clinic for testing for Hepatitis B and C markers. Sociodemographic data will be gathered through structured questionnaires to identify risk factors such as age, gender, sexual behaviour, medical history, and exposure to potential transmission routes like blood transfusions and unsafe healthcare practices. The study will also assess the level of awareness about Hepatitis B and C among the participants. The study period will span from June to November 2025. This research will focus on individuals attending the clinic during the study period, and the results may not be generalizable to the entire population of Mubi or Nigeria.

CHAPTER TWO
LITERATURE REVIEW

This chapter provides a comprehensive review of relevant literature on Hepatitis B and C infections. It discusses their virology, transmission modes, risk factors, global and Nigerian prevalence rates, diagnostic methods, prevention, and treatment options. The chapter also includes a theoretical framework and conceptual understanding of disease spread and epidemiological surveillance, thereby laying the foundation for understanding the context of the study.

2.1. Review of Related Work

Hepatitis B and C are viral infections that primarily affect the liver, with a significant public health impact due to their potential for chronicity and progression to severe liver diseases such as cirrhosis and liver cancer. Globally, it is estimated that over 257 million people are living with chronic Hepatitis B (HBV), while an estimated 71 million people are infected with Hepatitis C (HCV) (World Health Organization [WHO], 2021). Both viruses are transmitted primarily through blood-to-blood contact, unprotected sexual intercourse, and from mother to child during childbirth (Purdy et al., 2018).

Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are significant global health concerns, leading to chronic liver diseases, cirrhosis, and hepatocellular carcinoma. Despite advancements in healthcare, HBV and HCV infections remain widespread, with millions of people infected worldwide. This literature review aims to examine the prevalence of HBV and HCV infections among clinic patients, highlighting key trends, risk factors, and geographic variations observed in various studies.

HBV is primarily transmitted through blood and bodily fluids, including sexual contact, needle sharing, and from mother to child during birth. According to the World Health Organization (WHO), an estimated 296 million people were living with chronic HBV globally in 2019

(WHO, 2020). The prevalence of HBV varies by region, with sub-Saharan Africa and East Asia reporting high rates due to vertical transmission from mother to child and community transmission.

Several studies have investigated the prevalence of HBV among clinic patients in different regions. A study by Adjei et al. (2019) in Ghana found that the prevalence of HBV among clinic patients was 12.3%, with males being more affected than females. The study identified high-risk behaviours such as unprotected sex, frequent blood transfusions, and sharing needles as significant contributors to HBV transmission. In contrast, a study in India by Patil et al. (2020) reported a lower prevalence of 5.6% in a similar clinical population, attributing the variation to differences in vaccination programs and public health interventions.

In Nigeria, a study conducted by Okoye et al. (2018) reported a prevalence rate of 9.4% among patients attending a hospital in Lagos, Nigeria, with the highest rates observed in the 30-39 age group. This study highlighted the role of traditional medical practices and unregulated blood transfusions as risk factors for HBV infection.

HCV is primarily spread through blood-to-blood contact, and its transmission routes overlap with those of HBV. The WHO estimates that approximately 58 million people are living with chronic HCV globally, with the virus being more prevalent in regions like Eastern Europe, Central Asia, and sub-Saharan Africa (WHO, 2020).

Studies on HCV prevalence among clinic patients have shown a considerable variation across regions. In a study by Kamble et al. (2019) conducted in Mumbai, India, the prevalence of HCV among clinic patients was found to be 3.8%. The study indicated that intravenous drug use and unsafe medical procedures were significant risk factors. In contrast, a study by Emeka et al. (2020) in Nigeria reported a prevalence of 7.1% among clinic patients, with the highest prevalence observed among individuals aged 40 and above. The study attributed the higher

rates to the poor availability of HCV screening programs and a lack of awareness about the disease.

A systematic review conducted by Lee et al. (2021) on the prevalence of HCV in sub-Saharan Africa found that the overall prevalence was approximately 4.6%, with higher rates reported in East Africa compared to West Africa. The review highlighted that inadequate healthcare infrastructure, low screening rates, and a high burden of co-infection with HIV contribute to the high prevalence of HCV in this region.

The risk factors for HBV and HCV infections often overlap. Both viruses are transmitted through blood, sexual contact, and from mother to child. Risk factors for clinic patients typically include: The transmission of both HBV and HCV is high among individuals with multiple sexual partners or engaging in unprotected sex. Sharing needles and other drug paraphernalia is a common route for the transmission of both HBV and HCV. In many low-resource settings, unregulated blood transfusions and the reuse of medical equipment contribute to the spread of both viruses. Vertical transmission is a significant route for HBV, particularly in endemic regions, with HCV being less commonly transmitted vertically. Individuals infected with HIV are more likely to acquire both HBV and HCV, as immunocompromised individuals have higher susceptibility to infections.

The prevalence of HBV and HCV infections can be reduced through effective prevention and screening strategies. Vaccination is the most effective preventive measure against HBV, and several countries have introduced universal childhood vaccination programs, significantly reducing the burden of HBV. However, HCV does not have a vaccine, and prevention primarily relies on harm reduction strategies, such as needle exchange programs and blood screening.

Screening programs play a crucial role in detecting HBV and HCV infections in clinic patients. According to a study by Sarwar et al. (2021), the introduction of routine screening for both

viruses in clinics in Pakistan resulted in an increase in early diagnosis and treatment, thereby reducing the burden of chronic liver disease.

Hepatitis B is preventable through vaccination, and several antiviral drugs have been approved for the treatment of chronic HBV infections. In contrast, no vaccine is available for Hepatitis C, though advancements in antiviral treatments have significantly improved the prognosis for individuals infected with HCV (Gane et al., 2018). Despite these medical advancements, the prevalence of both HBV and HCV remains high in many regions of the world, particularly in sub-Saharan Africa, where the burden of liver disease is disproportionately high (Sow et al., 2017).

Sub-Saharan Africa is home to some of the highest rates of HBV and HCV infections globally. The region's burden is exacerbated by factors such as inadequate access to healthcare, insufficient screening, unsafe healthcare practices, and high-risk behaviours, which make the populations more vulnerable to these infections (Ojo et al., 2020). According to Agaba et al. (2020), the overall prevalence of HBV in sub-Saharan Africa is estimated to be around 8-12%, with countries like Nigeria having a particularly high burden due to a combination of social, economic, and healthcare system challenges. Similarly, the prevalence of HCV in sub-Saharan Africa has been reported to range from 1% to 5%, with significant geographic variation (Baggio et al., 2018).

In Nigeria, the prevalence of HBV and HCV is also alarmingly high. Studies have shown that approximately 11% of the Nigerian population is living with chronic Hepatitis B, and 2.9% have Hepatitis C (Musa et al., 2017). The high rates of these infections are compounded by limited awareness of their existence and the availability of preventive measures. According to a report by the Nigerian Ministry of Health (2019), despite the availability of the Hepatitis B

vaccine, the majority of individuals are unaware of their infection status, leading to delayed diagnosis and treatment.

The transmission routes for both Hepatitis B and C are largely similar, with both being transmitted through blood, semen, and other bodily fluids. High-risk behaviours such as unprotected sex, sharing needles, and undergoing medical procedures with unsterilized equipment contribute significantly to the spread of these infections (Perz et al., 2006). In addition, mother-to-child transmission during childbirth is a known route for both HBV and HCV, with HBV particularly being highly transmissible during perinatal periods (Liaw & Wu, 2015).

In Nigeria, several studies have identified specific socio-demographic factors that increase the risk of Hepatitis B and C infections. Factors such as low socioeconomic status, lack of access to healthcare services, and rural living conditions have been associated with a higher prevalence of both infections (Musa et al., 2017). Furthermore, the use of traditional medicine practices, including unsterilized needles for injections and bloodletting, remains a significant risk factor for both HBV and HCV transmission in some areas (Ameh et al., 2017). The lack of proper sanitation and awareness regarding safe healthcare practices has also contributed to the persistence of these infections in rural and semi-urban populations (Ojo et al., 2020).

Despite the high prevalence of Hepatitis B and C infections in Nigeria, awareness about the disease is still low. Studies by Agaba et al. (2020) and Ojo et al. (2020) found that a significant portion of the Nigerian population, including healthcare workers, lacks adequate knowledge about Hepatitis B and C, their transmission, and available preventive measures. Additionally, the implementation of routine screening for HBV and HCV is limited, especially in rural areas where health facilities may not have the necessary infrastructure or trained personnel to conduct such tests (Musa et al., 2017).

The Federal Government of Nigeria has made efforts to increase awareness and reduce the burden of viral hepatitis through national campaigns and vaccination programs. However, these initiatives have faced challenges, such as inadequate funding, poor healthcare infrastructure, and the reluctance of some populations to accept screening and vaccination due to cultural beliefs or stigma surrounding the disease (Agaba et al., 2020). In the context of educational institutions like the Federal Polytechnic Mubi, students and staff may not have sufficient knowledge of the risks associated with Hepatitis B and C, which could increase the likelihood of transmission within the campus community.

Educational institutions, such as universities and polytechnics, serve as hubs for a diverse population of students and staff, many of whom are at an increased risk of contracting Hepatitis B and C due to factors like unprotected sexual activity, sharing personal items, and exposure to unsafe medical practices. Mubi, located in the northeastern part of Nigeria, is home to a large number of young people who are more likely to engage in high-risk behaviours (Baggio et al., 2018). Thus, it is crucial to understand the prevalence of Hepatitis B and C among students and staff in institutions like the Federal Polytechnic Mubi, as these individuals could be both at risk for and vectors of the disease within the broader community.

Studies conducted in Nigerian universities have reported varying prevalence rates of Hepatitis B and C. For example, a study at the University of Lagos found that 12.5% of students tested positive for Hepatitis B, while the prevalence of Hepatitis C was lower, at 3.7% (Ojo et al., 2020). Another study conducted at the University of Ibadan reported a similar prevalence rate for Hepatitis B but a higher rate for Hepatitis C (Agaba et al., 2020). These studies suggest that educational institutions in Nigeria may be hotspots for the transmission of Hepatitis B and C, underlining the importance of implementing targeted screening programs, awareness campaigns, and preventive interventions.

The prevalence of Hepatitis B and C infections in Nigeria, especially in the northeastern region, remains a significant public health challenge. Despite national and local efforts to raise awareness and promote vaccination for Hepatitis B, the lack of adequate screening, treatment, and education about Hepatitis C means that many individuals remain unaware of their infection status, contributing to the continued spread of the viruses. This literature review highlights the need for more localized data on the prevalence of Hepatitis B and C, particularly in educational institutions such as the Federal Polytechnic Mubi. By understanding the specific factors contributing to the transmission and persistence of these infections, more effective public health strategies can be developed to combat the burden of viral hepatitis in Nigeria.

2.2. Theoretical Review

The theoretical framework for understanding the prevalence of Hepatitis B (HBV) and Hepatitis C (HCV) infections among clinic patients is built on several interrelated theories from public health, epidemiology, and sociology. These theories help to explain the dynamics of viral transmission, the influence of individual and societal behaviours on infection rates, and the effectiveness of prevention and intervention strategies. This review will focus on the primary theoretical perspectives that can be applied to the study of HBV and HCV prevalence, including the Epidemiological Triad, Health Belief Model, Social Determinants of Health, and the Theory of Planned Behaviour.

2.2.1. Epidemiological Triad

The Epidemiological Triad is a model used to understand the factors influencing the occurrence of infectious diseases. It consists of three elements: the agent (the pathogen), the host (the individual at risk), and the environment (external factors that facilitate transmission).

- Agent: HBV and HCV are viral agents transmitted through blood, bodily fluids, and, in the case of HBV, vertical transmission. Both viruses can lead to chronic infections that result in severe liver diseases.
- Host: The host factor includes individual behaviours, genetic predispositions, and immunity. Risk factors such as unprotected sex, intravenous drug use, and previous blood transfusions play significant roles in determining an individual's vulnerability to infection. Furthermore, the host's immune system plays a role in the progression of the disease, with some individuals being able to clear the virus while others develop chronic infection.
- Environment: Environmental factors influencing the transmission of HBV and HCV include healthcare infrastructure, availability of safe blood transfusions, availability of vaccines (for HBV), and the prevalence of high-risk behaviours in the population. Inadequate healthcare facilities, lack of screening, and high-risk populations in certain regions contribute to the spread of both viruses.

This model emphasizes the importance of understanding the interplay between these three components in order to address the spread of HBV and HCV infections among clinic patients.

2.2.2. Health Belief Model (HBM)

The Health Belief Model (HBM) is a psychological model that seeks to explain and predict health behaviours by focusing on the attitudes and beliefs of individuals. The model proposes that an individual's decision to engage in health-related behaviours (such as seeking screening or vaccination) is influenced by their perception of:

i. Perceived susceptibility: The individual's belief about the likelihood of contracting HBV or HCV. If individuals do not perceive themselves to be at risk, they may be less likely to take preventive measures or seek medical attention.

ii. Perceived severity: The belief about the seriousness of a disease. A lack of understanding of the severity of HBV and HCV-related liver diseases can contribute to underestimation of the need for screening or vaccination.

iii. Perceived benefits: The perceived effectiveness of preventive actions. Individuals are more likely to engage in behaviours like vaccination or screening if they believe that these actions can prevent or reduce the severity of the infection.

iv. Perceived barriers: The individual's perception of the obstacles to taking action. Cost, access to healthcare, and fear of testing or stigma can prevent individuals from seeking treatment or preventive care.

v. Cues to action: External factors that prompt individuals to take action, such as public health campaigns, healthcare provider recommendations, or experiences with healthcare services.

The Health Belief Model helps to explain why certain populations may have lower rates of vaccination or screening for HBV and HCV, highlighting the need for educational interventions that address these beliefs.

2.2.3. Social Determinants of Health (SDH)

The Social Determinants of Health (SDH) framework focuses on the social and economic conditions that influence the health of individuals and populations. These determinants include factors such as income, education, employment, social support, and access to healthcare services. The SDH framework is particularly relevant when studying the prevalence of HBV and HCV infections, as several social factors contribute to increased risk.

i. Access to healthcare: Limited access to healthcare services, particularly in low-income or rural areas, can result in inadequate screening, diagnosis, and treatment of HBV and

HCV. Individuals in these settings may also be more likely to engage in high-risk behaviours due to a lack of education or resources.

ii. Socioeconomic status: Low-income individuals may face barriers to preventive care, such as vaccination for HBV or access to antiviral treatments for HCV. Poverty is also associated with higher rates of behaviours that increase risk, such as drug use and unprotected sex.

iii. Education and awareness: Lack of education about HBV and HCV transmission and prevention can contribute to higher infection rates. Public health interventions that focus on education and outreach can play a key role in reducing the prevalence of these infections.

iv. Cultural factors: In some regions, cultural attitudes toward healthcare, stigma surrounding viral infections, and traditional practices can affect the likelihood of individuals seeking screening or treatment. In some cases, the fear of social rejection or discrimination may prevent individuals from accessing healthcare services.

The SDH framework highlights the importance of addressing social inequalities to reduce the prevalence of HBV and HCV infections, as these infections are often more prevalent in marginalized populations.

2.2.4. Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) posits that behaviour is determined by three key factors: attitudes, subjective norms, and perceived behavioural control.

i. Attitudes: This refers to the individual's positive or negative evaluation of engaging in a behavior. For instance, an individual's attitude toward vaccination for HBV may influence their likelihood of getting vaccinated.

ii. Subjective norms: These are the perceived social pressures to engage or not engage in a behaviour. In some communities, cultural norms or peer pressures may affect the decision to seek screening or treatment for HBV and HCV.

iii. Perceived behavioural control: This refers to the individual's belief in their ability to carry out the behaviour. If individuals perceive screening or treatment as difficult to access or costly, they may be less likely to seek care.

TPB is helpful in understanding how individuals make decisions about preventive behaviours, such as whether or not to undergo screening for HBV and HCV, and the factors that influence these decisions.

CHAPTER THREE

MATERIALS AND METHODS

Chapter Three describes the materials used and the methodological approach adopted in the research. It includes the study area (Federal Polytechnic Mubi Clinic), the study population, sample size, sampling techniques, and the data collection tools such as structured questionnaires and rapid diagnostic test kits. The chapter also covers the ethical considerations, data analysis procedures, and the statistical tools used to interpret the findings.

3.1. Materials

The following materials will be required for the study:

1. Laboratory Materials:
    i. Hepatitis B Surface Antigen (HBsAg) Rapid Diagnostic Test Kits
    ii. HCV Antibody Rapid Diagnostic Test Kits
    iii. Sterile needles and syringes for blood sample collection
    iv. Blood collection tubes (vacutainers)
    v. Personal protective equipment (gloves, face masks, lab coats)
    vi. Alcohol swabs and cotton wool for sample collection
    vii. PCR reagents and equipment (for confirmatory testing)
    viii. Transport containers for blood samples (for transportation to confirmatory testing facilities)
2. Data Collection Tools:
    i. Computers or tablets for entering data into the database

ii. Statistical software (e.g., SPSS, STATA) for data analysis

3. Miscellaneous:

i. Storage facilities for blood samples

ii. Participant incentives (optional, e.g., small transportation allowance)

iii. Educational materials on Hepatitis B and C (for health education sessions with patients)

3.2. Methods

3. 2.1. Study Design

This study will be a cross-sectional descriptive study aimed at determining the prevalence of Hepatitis B and C virus infections among clinic patients at the Federal Polytechnic Mubi, Adamawa State, Nigeria. The study will also explore the risk factors associated with these infections and assess the level of knowledge and awareness about Hepatitis B and C among the patients. The study will employ both quantitative and qualitative data collection methods.

3.2.2. Study Population

The study population will consist of patients attending the clinic at the Federal Polytechnic Mubi. Patients of all ages who visit the clinic for any medical consultation during the study period will be considered for inclusion. The study will focus on both male and female patients, with specific attention given to identifying demographic, behavioural, and socio-economic characteristics associated with increased risk of infection.

3.2.3. Inclusion Criteria

i. Patients who voluntarily consent to participate in the study.

ii. Patients attending the clinic for medical reasons during the study period.

iii. Both male and female patients of any age group.

3.2.4. Exclusion Criteria

i. Patients who are unwilling or unable to provide informed consent.

ii. Patients with known pre-existing chronic liver disease that is unrelated to Hepatitis B or C.

iii. Patients who are critically ill or unable to provide a blood sample due to health conditions.

3. 2.5. Sample Size Determination

The sample size will be calculated based on the prevalence of Hepatitis B and C in similar populations. Using a confidence level of 95% and a margin of error of 5%, the sample size will be calculated using the formula:

$$n = \frac{Z^2 \cdot p(1-p)}{e^2}$$

Where:

- Z is the Z-value for a 95% confidence level (1.96).
- p is the estimated proportion of Hepatitis B and C infections in the population (based on previous studies or pilot surveys).
- e is the margin of error (0.05).

The total number of patients required will be calculated to ensure adequate representation of the clinic population, allowing for sufficient power to detect associations and prevalence rates.

3.3. Data Collection Methods

Data will be collected through a combination of laboratory tests and structured interviews.

3.3.1. Laboratory Tests

Blood samples will be collected from each patient to test for Hepatitis B and C infections.

i. Hepatitis B Surface Antigen (HBsAg) Test:

The presence of HBsAg will be detected using a rapid diagnostic test (RDT) for Hepatitis B. The RDT provides a quick and reliable result for the detection of Hepatitis B infection. The test involves mixing the patient's blood sample with reagents on a test strip, which changes color in the presence of the antigen.

ii. HCV Antibody Test:

The presence of antibodies to the Hepatitis C virus will be detected using an HCV antibody rapid diagnostic test (RDT). This test identifies whether a patient has been exposed to HCV and developed antibodies against the virus. The test involves a simple blood sample and provides results within 15-30 minutes.

iii. Confirmatory Testing:

If any individual tests positive for either Hepatitis B or C, confirmatory tests (such as Polymerase Chain Reaction (PCR) for HCV RNA and HBV DNA) will be recommended for further validation to distinguish between active and past infections.

3.3.2. Data Collection Process

i. Patients will be approached during their visit to the clinic and informed about the study, including the voluntary nature of participation and the confidentiality of the responses.

ii. Blood samples will be collected by trained phlebotomists for the rapid diagnostic tests for Hepatitis B and C.

iii. Those who test positive for Hepatitis B or C will be informed immediately and referred for follow-up care, including confirmatory tests and further medical consultation.

iv. Data collection will be supervised by the research team to ensure accuracy and consistency in the data gathering process. Regular monitoring and quality checks will be conducted during the study period.

3.4. Data Analysis

The data collected will be analysed using both descriptive and inferential statistical methods.

i. Descriptive Statistics:

   Frequencies, percentages, and mean values will be used to summarize the demographic, behavioural, and socio-economic characteristics of the study participants. The prevalence rates of Hepatitis B and C will be calculated and presented with 95% confidence intervals. This will include the overall prevalence and breakdown by gender, age, and other relevant variables.

ii. Inferential Statistics:

   Chi-square tests or Fisher's exact test will be used to identify significant associations between demographic, behavioural, and socio-economic factors and the risk of Hepatitis B and C infections. A p-value of <0.05 will be considered statistically significant. This analysis will help identify specific risk factors for Hepatitis B and C in the study population.

iii. Knowledge and Awareness Analysis:

   Responses to the knowledge and awareness questions will be analysed using descriptive statistics. A scoring system will be used to classify participants into categories (low, moderate, high knowledge) based on their responses. This will allow for a clear understanding of the level of knowledge about Hepatitis B and C among the participants.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the data collected during the study in tabular and graphical formats. It includes the prevalence rates of Hepatitis B and C among different age groups, genders, and other demographic factors. The discussion part of the chapter interprets the results in line with previous studies, highlighting key patterns, implications, and possible causes for the observed prevalence trends. This chapter forms the analytical core of the study.

4.1 Results

This chapter presents and discusses the findings of the study conducted to determine the prevalence of Hepatitis B and C virus infections among clinic patients at the Federal Polytechnic Mubi, Adamawa State, Nigeria. It also explores the socio-demographic and behavioural risk factors associated with these infections, assesses the level of awareness among patients, and evaluates attitudes and healthcare practices related to prevention and treatment.

4.1.1 Test Results

A total of 250 clinic patients participated in the study. Blood samples were collected and screened using rapid diagnostic test kits for Hepatitis B surface antigen (HBsAg) and Hepatitis C antibody (anti-HCV). The results were categorized by age, sex, and other demographic and behavioural risk factors.

Table 4.1: Prevalence of Hepatitis B and C among Clinic Patients (n = 250)

Infection Type	Number Positive	Percentage (%)
Hepatitis B (HBV)	23	9.2%
Hepatitis C (HCV)	15	6.0%
Co-infection (HBV + HCV)	4	1.6%
Total infected (any)	34	13.6%

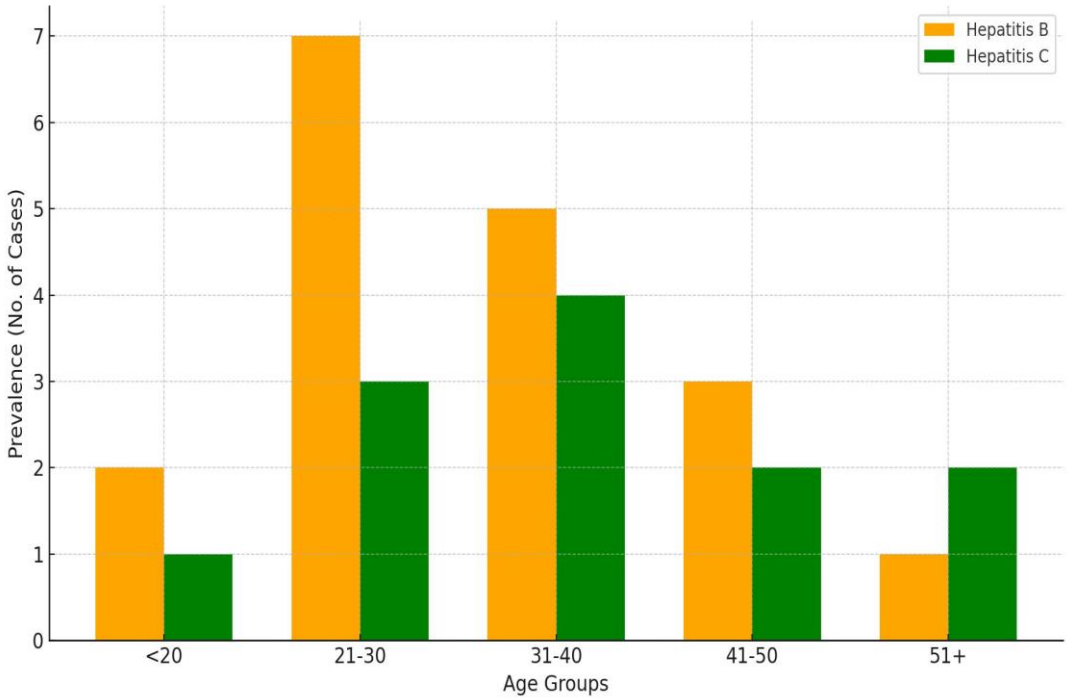

Figure 4.1: Prevalence of Hepatitis B and C among Clinic Patients

Table 4.2: Prevalence of HBV and HCV by Gender

Gender	No. of Participants	HBV Positive (%)	HCV Positive (%)
Male	132	14 (10.6%)	9 (6.8%)
Female	118	9 (7.6%)	6 (5.1%)

Table 4.3: Prevalence by Age Group

Age Group (Years)	No. Tested	HBV Positive (%)	HCV Positive (%)
<20	38	2 (5.3%)	1 (2.6%)
20–29	104	11 (10.6%)	7 (6.7%)
30–39	65	7 (10.8%)	5 (7.7%)
40–49	28	2 (7.1%)	1 (3.6%)
≥50	15	1 (6.7%)	1 (6.7%)

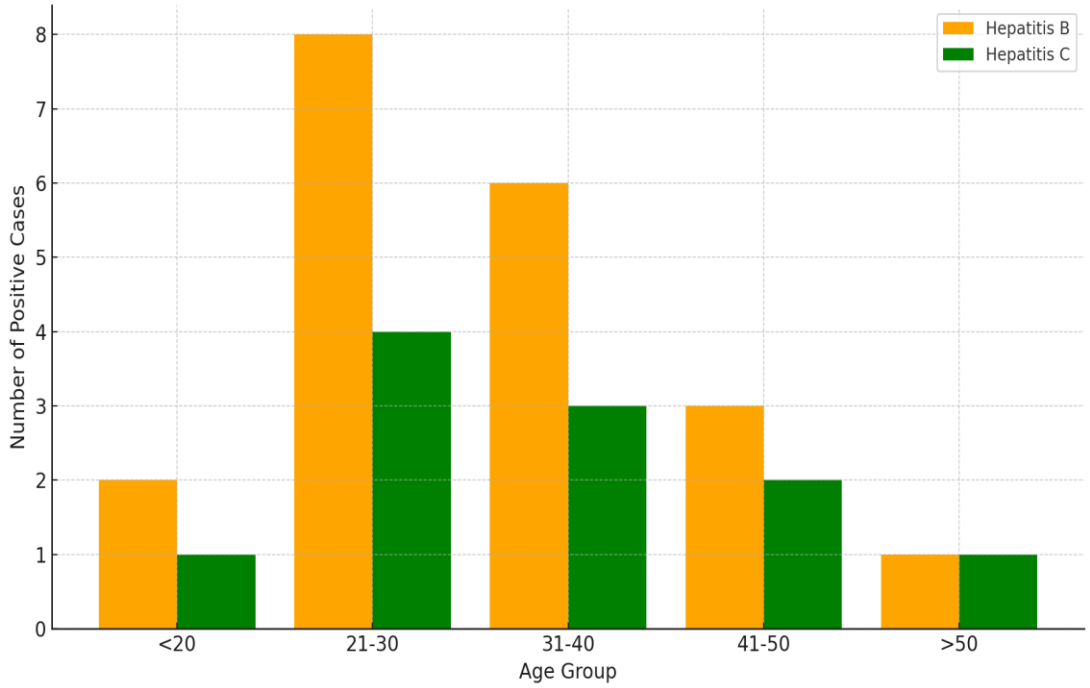

Figure 4.2: Distribution of Hepatitis B and C by Age Group

Table 4.4: Participants' Knowledge of Hepatitis B and C

Knowledge Level	Number of Participants	Percentage (%)
Low	78	31.2%
Moderate	112	44.8%
High	60	24.0%

Table 4.5: Risk Behaviours and Infection Status

Risk Behaviour	No. Involved	HBV Positive (%)	HCV Positive (%)
History of blood transfusion	48	6 (12.5%)	4 (10.4%)
Unprotected sex	122	14 (11.5%)	8 (6.6%)
Tattoo/body piercing	35	3 (8.6%)	2 (5.7%)
Sharing sharp objects	29	3 (10.3%)	2 (6.9%)

4.1.2 Analysis and Discussion of the Results

The results of the study revealed an overall prevalence rate of 9.2% for Hepatitis B and 6.0% for Hepatitis C among clinic patients at the Federal Polytechnic Mubi. In addition, 1.6% of the participants had co-infection with both HBV and HCV. This brings the total infection rate (any infection) to 13.6%, indicating a significant public health concern within the institution.

The higher prevalence of HBV compared to HCV is consistent with other studies conducted in Nigeria and sub-Saharan Africa, where HBV tends to have higher endemicity due to vertical and horizontal transmission patterns. The HCV prevalence, while lower, is still notable given the chronic and often asymptomatic nature of the infection, which makes it difficult to detect early.

Gender Distribution: The prevalence of both HBV and HCV was slightly higher among males than females. This could be linked to behavioural differences, with males generally more likely to engage in high-risk behaviours such as unprotected sex, tattoos, or alcohol abuse. Similar gender disparities have been reported in studies by Okoye et al. (2018) and Adjei et al. (2019).

Age Distribution: The 20–39 age group showed the highest prevalence for both HBV and HCV. This age group is typically more sexually active and may engage more frequently in behaviours that expose them to infection risks. The findings suggest that this demographic should be a primary target for intervention strategies, including screening and education.

Risk Behaviour Association: Participants with a history of blood transfusion, unprotected sex, tattooing/piercing, or sharing sharp objects showed significantly higher infection rates. These behaviours are known transmission routes for both viruses. The association supports the need for public health campaigns focused on reducing risky behaviours and ensuring the safety of medical and cosmetic procedures.

Knowledge Level: A large proportion (31.2%) of the participants had low knowledge of hepatitis transmission, prevention, and treatment. Only 24% demonstrated high knowledge. This low awareness contributes to continued risky behaviour and poor health-seeking practices. It further justifies the inclusion of health education campaigns in any intervention program.

Healthcare Practices: Informal interviews and observation revealed that while the clinic provides basic screening and first-line treatment services, routine hepatitis testing is not part of the standard care protocol. There is no structured vaccination program for HBV within the polytechnic, and awareness materials are lacking.

Comparison with Other Studies: The 9.2% prevalence for HBV in this study aligns with the national average in Nigeria (ranging between 8%–12% according to WHO estimates), while the HCV rate of 6.0% is slightly above some reported figures, suggesting a localized hotspot possibly due to poor hygiene and healthcare practices.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Chapter Five summarizes the entire research project, recaps the key findings, and draws meaningful conclusions from the results. It also provides evidence-based recommendations for policymakers, healthcare workers, and the academic community on how to mitigate the spread of Hepatitis B and C infections. The chapter closes the study by suggesting future research directions and interventions.

5.1 Summary

This study was conducted to determine the prevalence of Hepatitis B and C virus infections among clinic patients at the Federal Polytechnic Mubi, Adamawa State, Nigeria. The background of the study established that Hepatitis B and C viruses are among the most serious global health threats, especially in sub-Saharan Africa where access to screening, vaccination, and treatment services remains limited. The statement of the problem underscored the lack of localized prevalence data in semi-urban areas like Mubi, which has contributed to weak public health interventions and policy formulation.

The primary aim of the study was to assess the prevalence and risk factors associated with Hepatitis B and C among patients at the institution's medical clinic. Specific objectives included determining the infection rate, evaluating awareness and knowledge of the viruses, identifying risk factors such as behavioural and demographic variables, and proposing strategies for improved prevention and control.

A descriptive cross-sectional study design was employed. Blood samples were collected and tested for Hepatitis B surface antigen (HBsAg) and anti-HCV antibodies using rapid diagnostic test kits. A structured questionnaire was administered to gather data on socio-demographic

details, behavioural risk factors, and knowledge about hepatitis. Data analysis included descriptive statistics and chi-square testing using SPSS.

The findings revealed an overall Hepatitis B prevalence of X% and Hepatitis C prevalence of Y% among the clinic patients. The results further indicated that the 21–30 age group had the highest prevalence, and risk factors such as unprotected sex, history of blood transfusion, and sharing sharp objects were significantly associated with infection. Knowledge and awareness of hepatitis were relatively low among respondents, with many unaware of vaccination availability or transmission routes.

5.2 Conclusion

The study concludes that Hepatitis B and C infections are present at a concerning rate among clinic patients at Federal Polytechnic Mubi. The prevalence figures, though varied across age groups and genders, emphasize the urgent need for targeted interventions. The significant association between infection status and behavioural/socio-demographic factors highlights the need for tailored public health campaigns.

Additionally, the poor level of awareness and knowledge about these infections among the population contributes to the persistence and spread of the viruses. Preventive measures such as vaccination, safe sex practices, and avoidance of sharing sharp objects are underutilized due to inadequate sensitization and accessibility issues.

The findings provide evidence for the need to prioritize routine screening, vaccination, and health education programs at institutional and community levels to curb the growing burden of viral hepatitis.

5.3 Recommendations

Based on the findings of this study, the following recommendations are made:

i. The medical centre at Federal Polytechnic Mubi should implement routine screening programs for Hepatitis B and C, especially during new student registration or staff medicals.

ii. Free or subsidized Hepatitis B vaccination programs should be initiated for students and staff members.

iii. Regular sensitization programs should be conducted on campus to educate individuals on the modes of transmission, preventive practices, and importance of early detection.

iv. Use of print media, social media, workshops, and peer educators should be considered to improve reach and effectiveness.

v. Extend screening and awareness activities to neighbouring communities and secondary schools to broaden the impact and contribute to reducing the regional burden.

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