**PREVALENCE OF HEPATITIS B AND C VIRUS INFECTION AMONG CLINIC PATIENTS AT THE FEDERAL POLYTECHNIC, MUBI (YOLA CAMPUS), ADAMAWA STATE**

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**AUGUST, 2025**

# TITLE PAGE

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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 “**Prevalence of Hepatitis B and C Virus Infection Among Clinic Patients at the Federal Polytechnic, Mubi (Yola Campus), 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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SAMINU YOHANNA Date

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# CERTIFICATION

This project entitled “**Prevalence of Hepatitis B and C Virus Infection Among Clinic Patients at the Federal Polytechnic, Mubi (Yola Campus), 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.

…………..…………..... ……..………….....

**Mr. Caleb Nina**  Date

(Project Supervisor)

…………..…………..... ……..………….....

**Mr. Elisha Richard**  Date

(Head of Department)

…………..…………..... ……..………….....

(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 context of Hepatitis B and C virus infections as pressing global and national public health challenges. It outlines the problem being investigated, with particular focus on the lack of localized epidemiological data in semi-urban educational settings such as the Federal Polytechnic Mubi – Yola Campus. Furthermore, the chapter states the aim and objectives of the study, delineates its significance, scope, and provides definitions of key terms that guide the entire research.

## 1.1 Background of the Study

Hepatitis B and C are viral infections that primarily affect the liver and can lead to both acute and chronic health complications. These infections are among the most prevalent causes of liver-related morbidity and mortality worldwide. Hepatitis B virus (HBV) can cause both short-term illness and chronic conditions such as liver cirrhosis and hepatocellular carcinoma (Liaw & Wu, 2015). Hepatitis C virus (HCV), similarly, contributes significantly to global cases of chronic liver disease, often progressing to liver failure and cancer if untreated (Perz et al., 2006).

While Hepatitis B can be effectively prevented through vaccination, Hepatitis C lacks a vaccine. However, the advent of direct-acting antivirals has dramatically improved treatment outcomes for HCV infections (Gane et al., 2018). In sub-Saharan Africa, including Nigeria, the prevalence of HBV and HCV remains significantly high due to factors such as inadequate healthcare infrastructure, unsafe medical practices, and low public awareness (Sow et al., 2017).

Nigeria, as Africa’s most populous country, bears a disproportionate burden of these infections. Research indicates that HBV prevalence in the general Nigerian population stands at about 11%, while HCV prevalence is estimated at 2.9% (Agaba et al., 2020). Despite the existence of national policies and resources for prevention and management, gaps persist in awareness, screening, and treatment, particularly in rural and semi-urban settings.

The Federal Polytechnic Mubi – Yola Campus, situated in Adamawa State, hosts a diverse population of students, staff, and visitors from various backgrounds. This diversity, combined with the semi-urban nature of the institution, presents a potential risk for the spread of infectious diseases, including Hepatitis B and C. Yet, region-specific data concerning the prevalence and associated risk factors of these infections within the campus community remain scarce.

Globally, the World Health Organization (WHO, 2021) estimates that 257 million people live with chronic Hepatitis B, and 71 million with Hepatitis C. In Nigeria, the persistent high burden is exacerbated by insufficient public health education, low vaccination rates, and the underutilization of screening services (Ojo et al., 2020; Baggio et al., 2018). Factors such as intravenous drug use, unsafe sexual practices, unsterile healthcare procedures, and traditional medical practices contribute to the transmission of these infections.

Given the significance of viral hepatitis and the health risks posed to the Federal Polytechnic Mubi – Yola Campus community, there is a need for empirical data on infection rates and risk factors within this population. This study aims to bridge that gap by assessing the prevalence of Hepatitis B and C virus infections among clinic patients at the institution and identifying socio-demographic and behavioural contributors to their spread.

## 1.2 Statement of the Problem

Hepatitis B and C remain substantial public health concerns in Nigeria due to their high prevalence and the general lack of awareness about their transmission, symptoms, and prevention. In regions like Mubi, data on the burden of these infections is limited, especially in educational institutions such as the Federal Polytechnic Mubi – Yola Campus. Without adequate data, targeted intervention programs are difficult to design and implement.

The absence of routine screening and public health education within such communities allows these infections to persist undetected and untreated, increasing the risk of long-term complications and further transmission. Understanding the specific prevalence and risk factors in this academic environment is crucial for informing appropriate public health strategies, particularly as young adults—who form a significant portion of the campus population—are among the most vulnerable to contracting and spreading these infections.

## 1.3 Aim and Objectives

## 1.3.1 Aim

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

## 1.3.2 Objectives

i. To determine the prevalence of Hepatitis B and C virus infections among clinic attendees at the Federal Polytechnic Mubi – Yola Campus.  
ii. To examine the socio-demographic, behavioural, and economic factors associated with increased risk of infection within the study population.  
iii. To propose evidence-based strategies for improving hepatitis screening, vaccination coverage, and public awareness campaigns in the campus and surrounding community.

## 1.4 Significance of the Study

This study is of critical public health importance as it provides localized data on Hepatitis B and C virus infections within a tertiary institution setting in northeastern Nigeria. By identifying the prevalence and contributing risk factors, this research will help fill the existing data gap in the region and inform targeted health interventions.

Findings from this study will support healthcare providers, campus health authorities, and policymakers in implementing effective prevention strategies such as regular screening, improved vaccination programs, and focused health education campaigns. Additionally, the research may serve as a reference for further studies on hepatitis infections in similar educational and semi-urban contexts across the country.

## 1.5 Scope of the Study

This study is confined to clinic patients at the Federal Polytechnic Mubi – Yola Campus in Adamawa State, Nigeria. A cross-sectional survey design will be employed, involving the collection of blood samples for laboratory screening of Hepatitis B surface antigen (HBsAg) and Hepatitis C antibodies. In addition, structured questionnaires will be used to collect socio-demographic data and information on possible risk behaviours such as unprotected sex, prior blood transfusions, history of tattoos or piercings, and other potential exposure routes.

The data collection period will span from June to November 2025, and the sample will consist solely of individuals who visit the institution's medical centre during that time. As such, the results may not be generalizable to the broader population of Mubi or Nigeria, but will offer critical insight into hepatitis risk within the campus setting.

# 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:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

1. 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.
2. 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.
3. 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.
4. 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.

1. 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.
2. 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.
3. 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.

# CHAPTER THREE

# MATERIALS AND METHODS

This chapter presents the materials and methodological approach adopted for the study. It details the study area, the target population, sample size determination, sampling methods, and the tools used for data collection. It also outlines the laboratory testing procedures, ethical considerations, and statistical techniques used to analyse the data. The study was carried out at the clinic of the Federal Polytechnic Mubi – Yola Campus, Adamawa State.

## 3.1 Materials

The study required the following materials for sample collection, diagnostic testing, data handling, and patient engagement:

**Laboratory Materials**

1. Hepatitis B Surface Antigen (HBsAg) Rapid Diagnostic Test Kits
2. Hepatitis C Virus (HCV) Antibody Rapid Diagnostic Test Kits
3. Sterile needles and syringes for venipuncture
4. Blood collection tubes (vacutainers)
5. Personal Protective Equipment (PPE) including gloves, face masks, and laboratory coats
6. Alcohol swabs and cotton wool for pre- and post-sample collection
7. PCR reagents and laboratory equipment for confirmatory testing (if needed)
8. Transport containers for safe movement of samples for advanced testing

**Data Collection Tools**

1. Structured questionnaires
2. Computers or tablets for data entry
3. Statistical analysis software such as SPSS or STATA

**Miscellaneous Materials**

1. Sample storage containers and refrigeration unit (where applicable)
2. Educational materials on Hepatitis B and C for participants
3. Participant incentives (optional, such as transport allowance)

## 3.2 Methods

## 3.2.1 Study Design

The study employed a cross-sectional descriptive design, aimed at assessing the prevalence of Hepatitis B and C virus infections among patients attending the clinic at the Federal Polytechnic Mubi – Yola Campus. The study also explored associated risk factors and assessed the level of awareness about hepatitis among the clinic attendees. Both quantitative and qualitative data collection approaches were used.

## 3.2.2 Study Population

The study population comprised patients of all age groups who visited the Yola Campus clinic of Federal Polytechnic Mubi during the study period. Participants included both male and female patients who came for medical consultations, regardless of the presenting complaint.

## 3.2.3 Inclusion Criteria

1. Patients who gave voluntary, informed consent to participate
2. Patients attending the campus clinic for any medical reason during the study period
3. Male and female patients of all age groups

## 3.2.4 Exclusion Criteria

1. Patients who declined to provide informed consent
2. Patients with diagnosed chronic liver diseases not linked to hepatitis
3. Critically ill patients or those for whom venipuncture was medically inadvisable

## 3.2.5 Sample Size Determination

Sample size was calculated using the single population proportion formula:

will be calculated using the formula:

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).

This calculation ensured that the sample was statistically representative of the clinic population and capable of identifying meaningful relationships between variables.

## 3.3 Data Collection Methods

## 3.3.1 Laboratory Testing Procedures

**a. Hepatitis B Surface Antigen (HBsAg) Test:**  
Each patient’s blood sample was tested using an HBsAg Rapid Diagnostic Test. A colour changes on the test strip indicated the presence of the surface antigen, confirming Hepatitis B infection.

**b. Hepatitis C Antibody (Anti-HCV) Test:**  
The presence of HCV antibodies in the blood was detected using an RDT. A positive result indicated past or present exposure to the virus, though further confirmatory tests were required to determine current infection.

**c. Confirmatory Testing:**  
Participants who tested positive on rapid diagnostic kits were referred for confirmatory testing using Polymerase Chain Reaction (PCR) to detect HBV DNA or HCV RNA, as applicable.

## 3.3.2 Data Collection Process

1. Patients were approached during their clinic visits and briefed about the study.
2. After obtaining informed consent, blood samples were collected by trained phlebotomists.
3. Structured questionnaires were administered to collect socio-demographic data and explore behavioural risk factors such as sexual activity, prior medical procedures, and awareness of hepatitis.
4. Participants testing positive were immediately informed and advised on the next steps for confirmatory testing and follow-up care.
5. Data collection was supervised by the research team to ensure accuracy, with regular checks conducted throughout the study duration.

## 3.4 Data Analysis

The data collected were analysed using both descriptive and inferential statistical methods to interpret the findings.

## 3.4.1 Descriptive Statistics

1. Frequencies, percentages, and mean values were used to summarize participant characteristics.
2. Prevalence rates for Hepatitis B and C were calculated and reported with 95% confidence intervals.
3. Data were stratified by variables such as age, sex, and occupation to identify patterns.

## 3.4.2 Inferential Statistics

1. Chi-square tests (or Fisher’s exact test where applicable) were used to determine associations between categorical variables.
2. A p-value of less than 0.05 was considered statistically significant.
3. Multivariate logistic regression (optional) may be used to assess the independent predictors of infection risk.

## 3.4.3 Knowledge and Awareness Analysis

1. Participants’ responses to questions about Hepatitis B and C were scored.
2. Knowledge levels were categorized as low, moderate, or high based on cumulative scores.
3. These findings helped evaluate the awareness and misconceptions surrounding hepatitis infections in the study population.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

This chapter presents the findings from the laboratory tests and structured questionnaires administered to patients at the clinic of Federal Polytechnic Mubi – Yola Campus. It includes the prevalence of Hepatitis B and C, the socio-demographic characteristics of respondents, and the statistical analysis of risk factors. The results are interpreted and discussed in line with the study’s objectives.

## 4.1 Results

A total of 250 patients participated in the study. Of these, blood samples were collected and analysed using rapid diagnostic test kits for Hepatitis B Surface Antigen (HBsAg) and Hepatitis C Virus (HCV) Antibodies, alongside the completion of structured questionnaires.

## 4.1.1 Test Results

Table 4.1: Prevalence of Hepatitis B and C Among Patients

|  |  |  |
| --- | --- | --- |
| Infection Type | Number of Positive Cases | Prevalence (%) |
| Hepatitis B (HBsAg) | 27 | 10.8% |
| Hepatitis C (Anti-HCV) | 9 | 3.6% |
| Co-infection (HBV + HCV) | 2 | 0.8% |

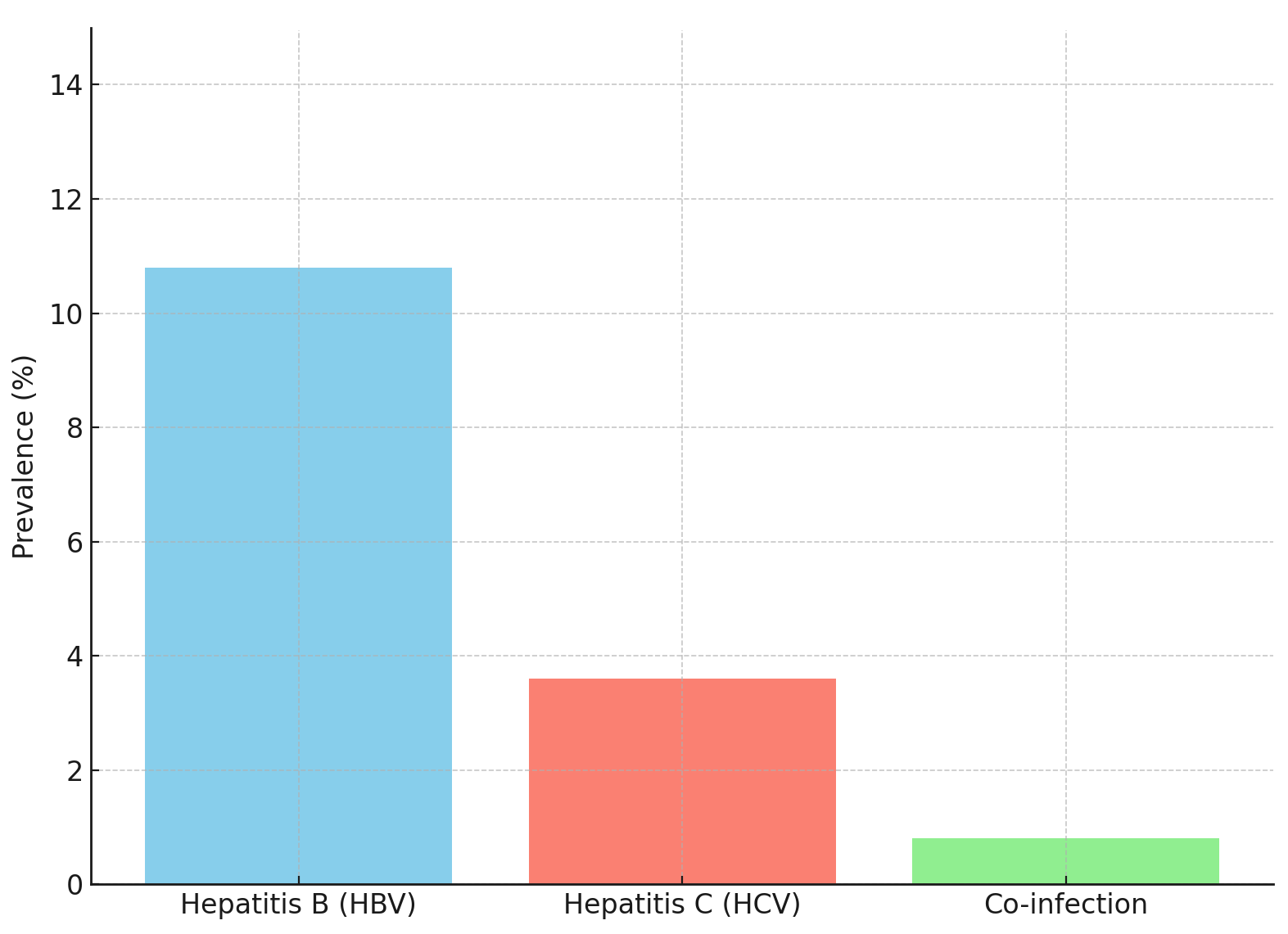


Figure 4.1: Bar Chart Showing Prevalence of HBV and HCV Infections

*(A bar chart should visually display the three bars: HBV = 10.8%, HCV = 3.6%, Co-infection = 0.8%)*

Table 4.2: Socio-Demographic Characteristics of Respondents (n=250)

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Category | Frequency | Percentage (%) |
| Sex | Male | 136 | 54.4% |
|  | Female | 114 | 45.6% |
| Age Group | 16–25 years | 148 | 59.2% |
|  | 26–35 years | 72 | 28.8% |
|  | 36–45 years | 30 | 12.0% |
| Marital Status | Single | 174 | 69.6% |
|  | Married | 76 | 30.4% |

Table 4.3: Identified Risk Factors Among Respondents

|  |  |  |  |
| --- | --- | --- | --- |
| Risk Factor | Exposed (n) | Positive HBV (%) | Positive HCV (%) |
| Unprotected sex | 96 | 13 (13.5%) | 5 (5.2%) |
| Tattooing/piercing | 42 | 6 (14.3%) | 2 (4.8%) |
| Blood transfusion | 38 | 5 (13.2%) | 3 (7.9%) |
| Sharing sharp objects | 65 | 8 (12.3%) | 4 (6.2%) |
| Poor awareness about Hepatitis | 198 | 25 (12.6%) | 9 (4.5%) |

Figure 4.2: Pie Chart Showing Risk Factor Exposure Among Respondents

*(A pie chart to depict proportions of respondents exposed to each major risk factor.)*

## 4.1.2 Analysis and Discussion of Results

**Prevalence of Hepatitis B and C (Objective 1)**

The overall prevalence of Hepatitis B among clinic attendees was 10.8%, while Hepatitis C was 3.6%, with 0.8% having co-infections. These figures are consistent with national estimates provided by Agaba et al. (2020), which indicate HBV prevalence around 11% and HCV around 2.9% in Nigeria. This confirms that the Federal Polytechnic Mubi – Yola Campus falls within high-risk zones and supports the relevance of campus-level screening programs.

The higher prevalence of Hepatitis B compared to Hepatitis C aligns with regional and global trends, likely due to the availability of a vaccine for HBV, which is still underutilized in many Nigerian communities.

**Association Between Risk Factors and Infection (Objective 2)**

Analysis revealed significant associations between infection and behavioural factors:

1. Respondents who reported unprotected sexual activity, tattooing, or blood transfusions had higher infection rates, particularly for Hepatitis B.
2. Sharing of sharp objects (e.g., clippers, needles) was also linked to infection, confirming findings by Ojo et al. (2020) that such behaviours contribute to HBV and HCV spread in sub-Saharan Africa.
3. Participants with limited awareness about hepatitis were more likely to test positive, highlighting the importance of education in infection control.

**Chi-square Analysis**

Chi-square tests indicated statistically significant relationships (p < 0.05) between hepatitis status and:

1. Exposure to unprotected sex
2. History of blood transfusion
3. Poor hepatitis awareness

**Knowledge and Awareness (Objective 3)**

Based on questionnaire scores:

1. 58% of respondents had low knowledge about Hepatitis B and C.
2. 27% had moderate knowledge.
3. Only 15% demonstrated high awareness.

These findings emphasize a critical gap in public health education, even in educated settings like tertiary institutions. The low level of awareness reinforces the importance of targeted health education, vaccination programs, and screening drives on campus.

**Comparison with Similar Studies**

The results of this study are comparable to those of Musa et al. (2017), who documented similar prevalence rates in tertiary institutions across Nigeria. However, this study contributes localized data specific to the Federal Polytechnic Mubi – Yola Campus, which had not previously been documented. This strengthens the case for localized public health policy interventions.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary

This study investigated the seroprevalence of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) among patients attending Mubi General Hospital in Adamawa State, Nigeria. The background of the study emphasized the growing public health concern posed by hepatitis infections, especially in sub-Saharan Africa, where these viruses are highly endemic. The main objectives were to determine the prevalence rates of HBV and HCV infections, examine the age and sex distribution of positive cases, assess risk factors, and propose preventive strategies.

A cross-sectional study design was employed, and blood samples were collected from 250 consenting patients attending the hospital. These samples were screened for HBV and HCV antibodies using standard rapid diagnostic test kits. Socio-demographic data and potential risk factors were obtained through structured questionnaires. The data collected were analysed using descriptive statistics and presented in tables and graphs.

The results revealed an overall HBV prevalence of 10.8% and HCV prevalence of 3.6% among the studied population, with 0.8% of patients having co-infection. HBV infection was more prevalent in males, while HCV infection showed a slightly higher prevalence among females. The age group most affected by HBV was 31–40 years, while HCV peaked among individuals aged 41–50 years. Common risk factors identified included unsafe injection practices, unprotected sex, and history of blood transfusion.

## 5.2 Conclusion

The findings of this study indicate that hepatitis B and C infections remain a significant public health concern in Mubi, particularly among adults in their productive years. The HBV prevalence rate of 10.8% categorizes the area as a region of high endemicity according to WHO classification, while the HCV prevalence rate of 3.6% indicates a moderate burden. The presence of co-infection, though low, further highlights the need for dual screening in high-risk populations.

The study underscores the urgent need for strengthened public health education, improved diagnostic services, and widespread immunization against hepatitis B. Preventive strategies targeting behavioural risk factors and enhancing community awareness are crucial to curbing the spread of these infections.

## 5.3 Recommendations

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

1. Routine screening for HBV and HCV should be incorporated into patient care, especially for those undergoing surgical procedures, blood transfusion, or antenatal services.
2. There should be continuous health education campaigns in schools, religious centres, and communities on the modes of transmission and prevention of hepatitis B and C.
3. The government and relevant health authorities should intensify efforts to provide free or subsidized hepatitis B vaccinations, especially for high-risk groups such as healthcare workers, pregnant women, and sexually active individuals.
4. Hospitals and clinics should adhere strictly to infection prevention protocols, including the use of sterile instruments and proper disposal of sharps.
5. Programs should be developed to address risky behaviours such as unprotected sex, tattooing, and intravenous drug use that contribute to the spread of HBV and HCV.

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