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A Retrospective study of Hepatitis B and C Viral Infection Predominance among illiterate Individuals of Capital Islamabad, Pakistan

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Abstract

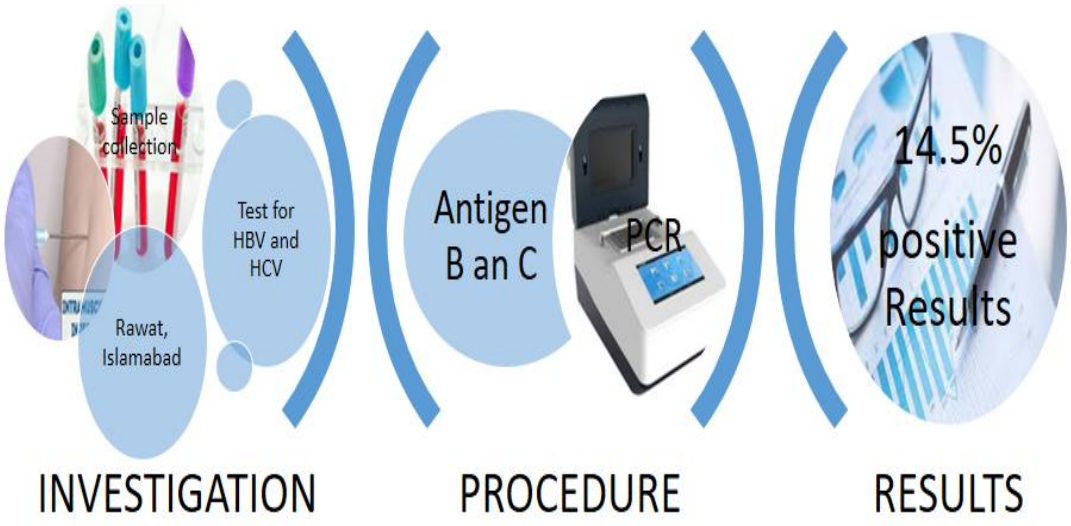
Background
Township of any state particularly the underdeveloped nations dependably experience the ill effects of low dimension of offices including cleanliness, drinking water, solid condition, oxygen inadequacy because of toxins, low therapeutic extras, non-clean cutting propensities, abundance of quacks having unimportant information of sterility and on the best is the non-preparatory sexual propensities which prompts the transcendence of viral contaminations including human resistant lack infection, Epstein Barr infection (EBV) But on the best is the Hepatitis B and C (HBV and HCV).

Methods
Distinctive therapeutic camps were sorted out under the stage of local healing facilities and medicinal consideration centers. An aggregate example of 310 people groups inside the age gathering of 18-42 years including the two sexes male and female were investigated in township region of Rawat, Islamabad. Atomic methods including PCR and ELISA were performed to authorize the presence of HBV and HCV in every individual's blood test.

Result:
Results gave off an impression of being extremely bewildering as 14.5% (45 out of 310) of the tried examples seems, by all accounts, to be contaminated by HBV and HCV in which 10.5% of individuals were Asymptomatic. High school gather individual's rate was 7%. A portion of the influenced individuals were recently hitched couple.

Conclusion:
Post investigates results under the watched measurements demonstrate that town regions of Rawat is under Red Zone part that could be disturbing sign for entire nation.

Keywords. Viral infections; Hepatitis B virus (HBV); Hepatitis C virus (HCV); Polymerase Chain Reaction (PCR); Enzyme-Linked Immunosorbent Assay (ELISA)



1.0. Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections remain major global public health concerns and are among the leading causes of chronic liver disease, cirrhosis, and hepatocellular carcinoma. In Pakistan, approximately 240,000 new cases of hepatitis B and C are reported annually, representing a significant burden on the healthcare system. Worldwide, more than 350 million individuals are chronically infected with HBV or HCV, and nearly three-quarters of these patients eventually develop persistent liver disease and its associated complications [1-4].

The transmission of hepatitis viruses is influenced by numerous behavioral, environmental, and socioeconomic factors. Poor hygienic conditions, unsafe sexual practices, and the transfusion of contaminated blood products are considered major contributors to the spread of these infections [5-6]. Furthermore, several community-associated practices, including the reuse of razors in barber shops, tattooing, unsafe injections, contaminated medical instruments, and treatment by unqualified healthcare practitioners, significantly increase the risk of viral transmission . The sharing of towels and other personal hygiene items may also facilitate the spread of infection, particularly in low-resource settings where awareness regarding infection control remains inadequate [7-10].

According to the World Health Organization (WHO), Pakistan is considered an intermediate endemic country for hepatitis B and C, with prevalence varying considerably among different regions and population groups [11-14]. Despite the implementation of several national immunization and disease prevention programs, substantial challenges remain in controlling the spread of viral hepatitis. Limited healthcare resources, inadequate vaccination coverage, lack of public awareness, poverty, and low literacy rates continue to hinder effective disease prevention and management [15].

Pakistan is considered one of the countries with the highest burden of viral hepatitis worldwide and has been recognized as a major contributor to the global prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. According to the World Health Organization (WHO), approximately 13.8 million people in Pakistan are living with chronic hepatitis B and C infections, including nearly 10 million individuals infected with HCV and about 3.8 million with HBV. Alarmingly, only 25–30% of infected individuals are aware of their disease status, resulting in delayed diagnosis and treatment and increasing the risk of disease progression to cirrhosis and hepatocellular carcinoma.

Pakistan bears one of the highest burdens of hepatitis C infection globally and ranks among the countries contributing substantially to the worldwide burden of chronic liver disease. Earlier national surveys reported an overall prevalence of 7.6% in the general population, comprising approximately 2.5% hepatitis B surface antigen positivity and 4.8% anti-HCV positivity. These findings highlighted the persistent burden of chronic viral hepatitis and emphasized the need for effective preventive and control measures.

Considerable geographical variations in disease prevalence have been observed across different provinces of Pakistan. Punjab has consistently reported the highest prevalence rates, with some studies demonstrating HCV seropositivity

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approaching 7%, whereas Sindh and Balochistan have shown prevalence ranging from 5–6%. Khyber Pakhtunkhwa and Gilgit-Baltistan generally exhibit comparatively lower prevalence rates, although regional differences are influenced by socioeconomic status, healthcare accessibility, and cultural practices. Recent evidence has further indicated that hepatitis delta virus coinfection among HBV patients is particularly prevalent in Balochistan and Sindh provinces, thereby increasing the risk of severe liver complications.

Several factors contribute to the widespread transmission of HBV and HCV in Pakistan. Unsafe therapeutic injections, inadequate screening of blood and blood products, reuse of syringes, non-sterile dental and surgical procedures, and improper infection control measures have been identified as major routes of transmission. Community-associated practices, including barber shaving with contaminated razors, body piercing, tattooing, and treatment by unqualified healthcare providers, further exacerbate the spread of these infections.

The burden of hepatitis is particularly high among populations with low literacy levels and limited healthcare access. Rural communities and economically disadvantaged populations are disproportionately affected because of inadequate awareness regarding disease transmission, poor sanitation, delayed diagnosis, and limited vaccination coverage. Illiteracy has been recognized as an important determinant of hepatitis transmission because individuals with limited educational backgrounds are less likely to adopt preventive measures and seek timely medical care.

Despite the introduction of hepatitis B vaccination under the Expanded Programme on Immunization (EPI) and the implementation of various national hepatitis control initiatives, Pakistan continues to face significant challenges in achieving the World Health Organization's target of eliminating viral hepatitis as a public health threat by 2030. The absence of universal birth-dose vaccination, insufficient screening facilities, poor surveillance systems, and inadequate public awareness remain major obstacles to disease control [16]. Furthermore, a substantial proportion of infected individuals remain asymptomatic for several years, allowing silent transmission within communities and contributing to the increasing burden of chronic liver disease. Epidemiological studies have indicated that nearly one in every nine individuals in Pakistan is at risk of acquiring hepatitis infection, which may progress to chronic liver damage, liver cirrhosis, and hepatocellular carcinoma if left untreated [17-18]. The prevalence of hepatitis B and C varies among different provinces and territories of Pakistan. Punjab has been reported to exhibit the highest prevalence, followed by Balochistan, Sindh, Khyber Pakhtunkhwa, Gilgit-Baltistan, tribal areas, and Azad Jammu and Kashmir. These regional differences may be attributed to disparities in socioeconomic conditions, healthcare accessibility, educational status, and infection control practices.

Previous studies have demonstrated that populations residing in rural and underprivileged areas are particularly vulnerable to HBV and HCV infections because of poor sanitation, inadequate healthcare infrastructure, and limited awareness regarding disease transmission and prevention. Illiteracy has been recognized as an important determinant of disease burden, as individuals with limited educational backgrounds often lack sufficient knowledge regarding vaccination, sterilization practices, and early disease diagnosis.

The township area of Rawat, Islamabad, represents one such vulnerable community where awareness regarding hepatitis prevention remains suboptimal. Residents in these regions are frequently exposed to unsafe healthcare practices and often rely on unqualified practitioners for medical treatment. Moreover, misconceptions and inadequate health education contribute to the persistence of behaviors that increase the likelihood of viral transmission [19-20]. Although various awareness campaigns have been initiated by hospitals and healthcare institutions, their effectiveness has been limited due to poor literacy and insufficient community participation. Consequently, many individuals continue to engage in practices that predispose them to hepatitis infection, thereby increasing morbidity and mortality associated with chronic liver diseases [21].

Therefore, the present retrospective study was conducted to determine the prevalence of hepatitis B and C among illiterate individuals residing in Rawat, Islamabad, Pakistan. The study aimed to evaluate the burden of viral hepatitis in this vulnerable population and to provide evidence that may assist policymakers and healthcare professionals in developing effective preventive strategies, awareness programs, and vaccination campaigns to reduce the incidence and long-term complications associated with hepatitis B and C infections. Hepatitis affecting individual's variates in different areas of Pakistan as shown in figure 1. Ratio is tabulated in table 1.

Table 1: Current research has shown the prevalence of hepatitis B and C in different areas of Pakistan

Hepatitis Infected Areas	Percentage of People Infected
Punjab	7%
Baluchistan	6%
Gilgit Baltistan	3%
Khyber Pakhtunkhwa	4%
Tribal areas	2%
Sindh	5%
Azad Kashmir	1%

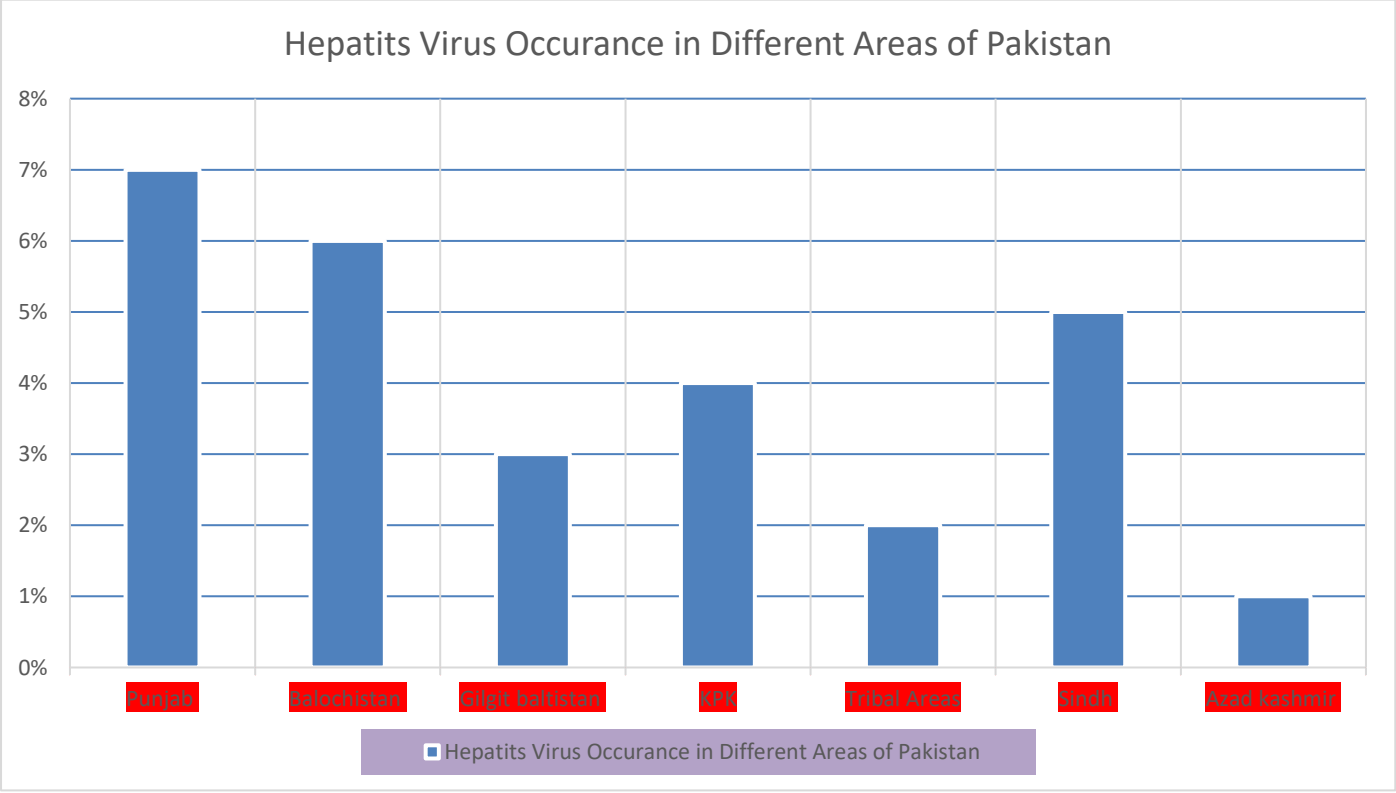


Figure 1.Showing the prevalence in different areas of Pakistan

The fundamental goal of this examination is to focus on innate territories of Islamabad particularly Rawat where uncontrolled improvement of Hepatitis B and C is going on [22]. Individuals are uninformed of wellsprings of this

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infection movement [23]. Mindfulness crusades are being propelled by various healing facilities and centers however because of absence of training individuals has turned out to be constant of their conduct and are not in the outlook of leaving the propensities that could prompt hepatitis and thusly passing of individuals [22, 24].

2.0. EXPERIMENTAL

Material and Methodology

A case control consider was finished with the assistance of Doctors and Physicians that were running tertiary consideration healing facilities and centers in Rawat zone, Islamabad. Blood Samples of 310 people chose through nonrandom example choice having the age gather 18-42 years were taken. Patients were being gotten some information about the chronicled foundation of having Hepatitis or C.

For investigation, 5ml of blood from every individual was gathered and safeguarded in EDTA enemies of coagulants hoses for timeframe. Centrifugation was finished with 1.5ml of blood for 10 min at 2400rpm that outcomes in detachment of platelets from serum. Than insusceptible chromatographic system was helped out through HBs Ag Devices for screening of hepatitis B and C infection in blood test [25].

Increasingly dynamic examination by Polymerase chain response was done on those examples which gave positive outcomes.

Further PCR examination for Hepatitis B infection DNA was finished by DNA extraction shape serum by including QIAamp Viral Dan pack (QIAGEN Inc., Hilden, Germany) and Esco with 96 well thermo cycler instruments. Two rounds of PCR devouring PCR Mix PR omega feline number 7502 M were performed utilizing sense and hostile to detect groundwork's. Last examination was done on agarose gel 2% on electrophoresis and seen under UV fluorescence light for shine [26].

PCR examination for Hepatitis C infection was done ribonucleic corrosive extricated from serum by including Rob screen Kit Germany. Maloney murine leukemia infection RT fermentase was utilized to turn around decipher HCV in 20 microlitres of test. MMLV support 4 µl, dNTPs 1 µl, 1 µl M-MLV switch transcriptase catalyst, and 1.5 µl RNase free water, hostile to detect groundwork 1 µl explicit, RNase inhibiter 13 µl and layout 10 µl were included.

Thermo cycler was utilized to shape cyclic DNA and a similar example of two rounds was done which further electrophoresed on agarose gel and envisioned under fluorescence UV light [26-27].

3.0. RESULTS

After the entire research approach when results were broke down and characterized in two different ways, one relying on the signs and manifestations of illness appearance and different premise on the age gatherings.

When we broke down on premise of caution signs, exceptionally stunning results showed up. 45 people (counting guys and females) gave off an impression of being influenced by HBV and HCV. The level of this influenced masses was 14.5%. The ratio of disease affecting persons is shown in figure 2.

A portion of the protest of stomach torment and shortcoming. Their blood levels were likewise low. They were appearing of being influenced by infection. The outcomes additionally incorporates the 10.5% (32 patients out of 45 influenced patients) which were Asymptomatic. They appear to be sound people and just sought retribution testing.

In the event that we talk about the age gatherings, than results were exceptionally irritating in light of the fact that out of 45% of influenced individuals,

- 7% of people were between 12-18 age gatherings. Furthermore, this gathering expected to be adolescent.
- 15 patients out of 45(33.3%) of patients were more youthful age and unmarried.
- 12 patients (26.6%) of patients were recently hitched couple. Furthermore, in the vast majority of the cases, the two accomplices were transporters
- 14 out of 45 were over 35 age gathering. Some is by all accounts having the indications while other were without sign.

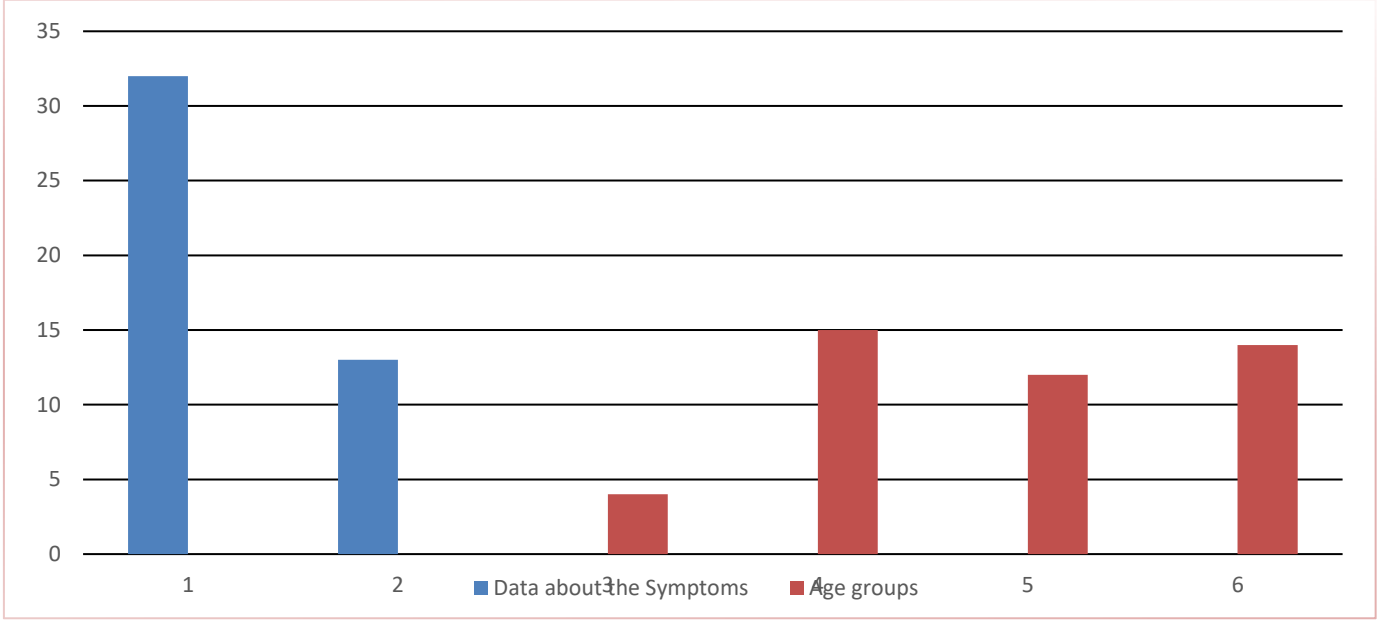


Figure 2. Indicating the ratio of persons affected

4.0. DISCUSSION

Viral hepatitis continues to represent a major public health challenge worldwide and remains a leading cause of chronic liver disease, liver cirrhosis, and hepatocellular carcinoma. Despite remarkable advances in diagnostic techniques, antiviral therapies, and preventive strategies, hepatitis B virus (HBV) and hepatitis C virus (HCV) infections continue to impose a substantial burden, particularly in developing countries. Pakistan, being a lower-middle-income country, faces numerous socioeconomic and healthcare-related challenges that contribute to the persistence and spread of viral hepatitis. Economic instability, poverty, limited healthcare resources, political uncertainties, and inadequate public awareness collectively create an environment favorable for the transmission of infectious diseases [28].

Among the various health concerns faced by the country, hepatitis B and C infections occupy a prominent position due to their high morbidity and mortality rates. The burden of these infections is particularly severe in underprivileged and rural communities, where access to healthcare facilities and preventive services remains limited. Individuals living below the poverty line often prioritize daily survival and economic needs over healthcare, resulting in delayed diagnosis and treatment. Moreover, lack of education and poor health literacy further hinder the adoption of preventive measures and contribute to the continuous spread of infection [29].

The findings of the present study indicate a considerable prevalence of hepatitis B and C among the population residing in Rawat, Islamabad. These findings are consistent with previous studies conducted in various regions of Pakistan, which have reported significant rates of HBV and HCV infections among vulnerable populations. Similar observations have been made in studies from Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan, highlighting the widespread nature of viral hepatitis across the country. Variations in prevalence among different regions may be attributed to differences in healthcare infrastructure, literacy rates, socioeconomic conditions, and cultural practices [19].

One of the most alarming findings of the present study is the occurrence of asymptomatic infections. A considerable proportion of infected individuals did not exhibit obvious clinical manifestations and appeared healthy. Such asymptomatic carriers constitute a hidden reservoir of infection and play a crucial role in disease transmission within the community. Because these individuals remain unaware of their infection status, they often fail to seek medical attention and unknowingly transmit the virus to others. Consequently, asymptomatic carriers represent a significant obstacle to hepatitis control programs and emphasize the importance of routine screening and early diagnosis.

Poverty and illiteracy have emerged as major determinants of hepatitis transmission in Pakistan. In many underdeveloped regions, individuals lack basic knowledge regarding disease prevention, vaccination, and infection control practices. Low literacy levels are associated with poor awareness concerning routes of transmission, symptoms, and the long-term consequences of viral hepatitis. Furthermore, misconceptions

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and cultural beliefs frequently discourage individuals from seeking medical consultation and timely treatment. These factors collectively contribute to delayed diagnosis and progression to advanced liver disease [30].

Another important contributor to the spread of hepatitis in Pakistan is the widespread use of unsafe medical practices. Reuse of syringes, inadequate sterilization of surgical instruments, unsafe dental procedures, and transfusion of unscreened blood products remain common in many healthcare settings. The problem is further aggravated by the presence of unqualified healthcare providers and quack practitioners who frequently administer unnecessary injections and employ improper infection control practices. Such practices substantially increase the risk of transmission of blood-borne pathogens, including HBV and HCV [31].

Community-related practices also contribute significantly to the dissemination of viral hepatitis. The use of contaminated razors and scissors at barber shops, body piercing, tattooing, and sharing of personal hygiene items such as towels and nail clippers have all been identified as potential sources of infection. Previous studies conducted in Pakistan have highlighted the role of barbers and beauty salons in facilitating disease transmission because of inadequate sterilization procedures. These findings underscore the importance of implementing strict infection control measures and enhancing awareness among individuals involved in such professions [32].

In addition to healthcare-associated transmission, certain behavioral and social factors may increase the risk of infection. Hepatitis viruses can be transmitted through unsafe sexual practices and close household contact. In conservative societies, discussions regarding sexual health are often considered taboo, resulting in poor awareness and reluctance to seek medical advice. Consequently, infected individuals may remain undiagnosed for prolonged periods, allowing the disease to progress and increasing the likelihood of transmission to spouses and family members [20].

The present study also revealed that younger individuals and newly married couples constituted a significant proportion of infected patients. These findings are of particular concern because young adults represent the economically productive segment of society. Chronic viral hepatitis among young individuals can have profound social and economic consequences, including reduced productivity, increased healthcare expenditures, and deterioration in quality of life. Similar trends have been reported in studies from neighboring countries, emphasizing the need for targeted awareness campaigns aimed at adolescents and young adults.

Healthcare accessibility remains another major challenge in rural and underserved areas. Residents of such communities frequently experience limited availability of diagnostic facilities, shortage of trained healthcare professionals, and inadequate screening services. Long distances to healthcare centers, transportation difficulties, and financial constraints further discourage individuals from seeking timely medical care. As a result, many patients present with advanced disease stages when therapeutic interventions become less effective [33].

The social stigma associated with hepatitis infection represents an additional barrier to disease control. Individuals diagnosed with hepatitis often experience discrimination and social isolation, leading to psychological distress and reluctance to disclose their disease status. Fear of social rejection may prevent infected individuals from undergoing screening or seeking appropriate treatment. Therefore, public awareness campaigns should not only focus on disease prevention but also address misconceptions and reduce stigma associated with viral hepatitis [34].

Preventive strategies remain the cornerstone of hepatitis control. Vaccination against hepatitis B has proven to be one of the most effective interventions for reducing disease incidence. Although Pakistan has incorporated hepatitis B vaccination into its Expanded Program on Immunization (EPI), gaps in vaccine coverage continue to exist, particularly in rural and marginalized populations. Strengthening immunization programs and ensuring universal vaccine accessibility are essential steps toward achieving the World Health Organization's goal of eliminating viral hepatitis as a

public health threat by 2030.

Health education and awareness campaigns are equally important in combating hepatitis. Educational interventions should be tailored according to local cultural norms and literacy levels. Community leaders, religious scholars, teachers, and healthcare workers can play a pivotal role in disseminating information regarding disease transmission and prevention. Awareness programs conducted in local languages and involving trusted members of society are likely to achieve greater acceptance and effectiveness [35].

Regular screening programs should also be promoted to facilitate early diagnosis and prompt initiation of treatment. Screening high-risk groups, including healthcare workers, blood donors, pregnant women, intravenous drug users, and family members of infected individuals, can significantly reduce disease transmission and improve clinical outcomes. Early identification of infected individuals enables timely antiviral therapy, thereby preventing progression to cirrhosis and hepatocellular carcinoma [36].

Overall, the findings of the present study highlight the urgent need for comprehensive public health interventions aimed at controlling hepatitis B and C infections in vulnerable populations. Addressing socioeconomic disparities, improving healthcare infrastructure, strengthening infection control practices, promoting vaccination, and enhancing community awareness are essential components of an effective hepatitis control strategy. Collaborative efforts involving healthcare professionals, policymakers, educational institutions, and community leaders are required to reduce the burden of viral hepatitis and improve the health status of the Pakistani population [37].

Therefore, sustained preventive measures, early diagnosis, and public awareness remain indispensable for minimizing the morbidity and mortality associated with hepatitis B and C and for achieving the global objective of hepatitis elimination.

CONCLUSION

Considering all observed findings and available evidence, it is evident that hepatitis B and hepatitis C remain significant public health concerns in many developing regions, including rural and semi-urban areas such as Rawat town and its surrounding communities. These viral infections are widely recognized for their ability to exist in both symptomatic and asymptomatic forms, which significantly contributes to their silent transmission within populations. In many cases, infected individuals remain unaware of their carrier status for extended periods, thereby unintentionally facilitating further spread of the disease.

The epidemiological pattern of hepatitis B and C in backward or under-resourced areas demonstrates a concerning trend. Limited access to healthcare facilities, inadequate screening programs, poor public awareness, and substandard hygienic practices collectively contribute to the persistence and propagation of these infections. In such settings, a large proportion of the population is either uneducated or lacks adequate awareness regarding modes of transmission, preventive measures, and the long-term complications associated with viral hepatitis, including cirrhosis, liver failure, and hepatocellular carcinoma.

A detailed review of patient data and observational findings indicates that younger populations are increasingly at risk of acquiring these viral infections. This shift in disease burden toward the youth is particularly alarming, as it poses a serious challenge for future public health management. Risk factors among younger individuals often include unsafe medical practices, reuse of contaminated syringes, unregulated blood transfusions, poor sterilization of surgical and dental instruments, and lack of awareness regarding personal hygiene. In addition, social behaviors and misconceptions about disease transmission further exacerbate vulnerability in this age group.

Another critical issue contributing to the spread of hepatitis infections is the widespread presence of misinformation and cultural misconceptions. In many rural communities, myths regarding disease causation and treatment often discourage individuals from seeking proper medical care or participating in screening programs. As a result, infected individuals frequently remain undiagnosed, which increases the risk of intra-familial and community-based transmission. Therefore, addressing misinformation through structured educational interventions is as important as medical management itself.

In light of these challenges, there is an urgent need to implement comprehensive awareness campaigns at the community level. Such campaigns should focus on educating the public about the modes of transmission of hepatitis B and C, the importance of early diagnosis, and the availability of

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effective preventive measures, including vaccination for hepatitis B. Special emphasis should be placed on high-risk groups, including healthcare workers, young adults, and individuals undergoing frequent medical or dental procedures.

Vaccination against hepatitis B should be promoted as a cornerstone of preventive strategy. Government and healthcare institutions should ensure that immunization services are accessible, affordable, and widely available, particularly in rural and underserved regions. Furthermore, routine screening programs should be established to identify infected individuals at an early stage, allowing timely intervention and reducing the risk of complications.

Equally important is the promotion of safe and hygienic practices in both healthcare and community settings. Medical instruments must be properly sterilized, disposable syringes should be used to prevent cross-contamination, and blood transfusion services must adhere strictly to screening protocols. In domestic environments, individuals should be encouraged to maintain cleanliness, avoid sharing personal items such as razors or toothbrushes, and practice proper hand hygiene.

In addition to preventive healthcare measures, anti-misinformation strategies should be strengthened. Community engagement programs involving local leaders, healthcare professionals, and educators can play a vital role in correcting misconceptions and promoting scientifically accurate information. Mass media, including radio, television, and social media platforms, can further support these efforts by disseminating clear and accessible health messages.

Overall, the findings from patient assessments suggest that viral hepatitis, particularly hepatitis B and C, remains a growing public health challenge in regions like Rawat town. The increasing prevalence among younger populations highlights the urgent need for coordinated intervention strategies. Without timely action, this situation may evolve into a more serious burden on future generations, both medically and economically.

Therefore, a multi-dimensional approach involving awareness, vaccination, improved hygiene practices, early screening, and misinformation control is essential to effectively reduce the incidence and impact of hepatitis infections. Strengthening healthcare infrastructure and community participation will be crucial in achieving long-term disease control and safeguarding public health in vulnerable regions.

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CONFLICT OF INTEREST

There is no conflict of interest in this research manuscript.

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