Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

PREVALENCE AND ASSOCIATED RISK FACTORS OF VIRAL HEPATITIS IN THE KHAIRPUR REGION, PAKISTAN

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DOI: https://doi.org/10.5281/zenodo.18218932

Keywords
Hepatitis, Prevalence, Risk factors, Healthcare practices, public health

Article History
Received: 03 November 2025
Accepted: 17 December 2025
Published: 31 December 2025

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Abstract

Viral hepatitis remains a serious public health concern in Pakistan, particularly in the Sindh province where unsafe medical practices and insufficient awareness contribute to high infection rates. This cross-sectional study was conducted to investigate the prevalence and associated risk factors of viral hepatitis among diagnosed patients in the Khairpur region. Purposive sampling was used to choose 500 confirmed hepatitis patients from university and different hospitals of Khairpur Mir's. A standardized questionnaire covering demographics, exposure history, clinical symptoms, and type of hepatitis was used to gather data. The results showed that males accounted for 79% of the cases, with teens and young adults having the highest prevalence. The most prevalent form was found to be Hepatitis C, which was followed by Hepatitis B. Several major risk factors were identified, including previous blood transfusions (44%), family contact with sick patients (50%), and inadequate understanding regarding transmission channels. Despite most participants having access to safe drinking water (66%), a majority lacked basic knowledge of hepatitis prevention (66%). Fever (30%), weariness (22%), abdominal discomfort (15%), Jaundice (10%), and joint pain (8%) were the most commonly reported symptoms. In order to stop the development of hepatitis in Khairpur, the study emphasizes the critical need for better awareness campaigns, safer medical procedures, and regular screening. Reducing community transmission requires increasing vaccination rates and enforcing stringent sanitation procedures in medical facilities. Further study with bigger sample sizes is recommended to explore changing epidemiological trends and increase public health interventions.

INTRODUCTION

Hepatitis is an inflammatory condition of the liver, most commonly caused by viral infections including hepatitis A, B, C, D, and E. The clinical spectrum of the disease ranges from asymptomatic or mild illness to severe complications such as liver cirrhosis, hepatocellular carcinoma, and death. Common symptoms include fatigue, jaundice, abdominal pain, nausea, and dark-colored urine; however, many individuals remain asymptomatic during the early stages of infection (Wu et al., 2022). Globally, viral hepatitis represents a major public health challenge, accounting for approximately 1.3 million deaths annually (WHO, 2017). Chronic infections with hepatitis B virus (HBV) and hepatitis C virus (HCV) are responsible for nearly 96% of hepatitis-related mortality worldwide, with a substantial proportion of

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ISSN: (e) 3007-1607 (p) 3007-1593

deaths occurring due to liver cirrhosis and hepatocellular carcinoma (Fill et al., 2018; Alberts et al., 2022). Accurate estimation of hepatitis-related mortality remains challenging because viral hepatitis is often underreported or misclassified on death certificates. Parenterally transmitted hepatitis infections are predominantly caused by HBV and HCV. The prevalence of these infections varies significantly across geographical regions and is closely associated with the severity of chronic liver diseases, including cirrhosis and hepatocellular carcinoma (Dunn et al., 2022).

In response to the growing global burden, the World Health Organization (WHO) launched the Global Health Sector Strategy in 2016, aiming to eliminate viral hepatitis as a public health threat by 2030. The elimination targets include a 90% reduction in incidence and a 65% reduction in hepatitis-related mortality compared to 2015 levels (WHO, 2017). Although the introduction of direct-acting antiviral therapies has revolutionized hepatitis C treatment, the absence of an effective vaccine and the presence of multiple HCV genotypes continue to hinder elimination efforts (Jatt et al., 2023; Gambhir et al., 2025; Alhaydar et al., 2025).

In low- and middle-income countries, viral hepatitis continues to spread rapidly due to factors such as poverty, illiteracy, inadequate healthcare infrastructure, unsafe medical practices, and insufficient hepatitis B vaccination coverage. Studies conducted in countries like Bangladesh emphasize the importance of population-based serological surveys in determining prevalence and identifying key risk factors to guide targeted interventions (Ashraf et al., 2010). In Pakistan, viral hepatitis poses a significant public health burden, with hepatitis B and C collectively responsible for approximately 31,000 deaths annually. Rising prevalence rates are largely attributed to unsafe injection practices, reuse of syringes, unregulated blood transfusions, poor hygiene conditions, and limited public awareness (Bozorgi et al., 2012).

Despite the high burden of viral hepatitis in Pakistan, region-specific epidemiological data remain limited. This study therefore aims to assess the prevalence and associated risk factors of viral hepatitis in the Khairpur region of Sindh, Pakistan. Understanding the local epidemiological patterns is essential for designing targeted prevention strategies, enhancing public awareness, and supporting evidence-based public health policy formulation.

MATERIALS AND METHODS

Study Design

In line with other epidemiological studies evaluating hepatitis prevalence in Pakistan, a cross-sectional study design was used to gather data from 500 patients who had been diagnosed with viral hepatitis (Pereira et al., 2009; Qureshi et al., 2010).

Sampling Technique

A Non-probability purposive sampling, which is frequently used in hospital-based hepatitis surveys that target confirmed patients, was employed to select participants (Samo et al., 2020).

Study Area

Information was acquired from different patients at Khairpur Medical College (KMC) Civil hospital Khairpur Mir's, Pir Abdul Qadir Shah Jeelani Institute of Medical Sciences (PAQSJIMS) also known as Gambat Institute of Medical Sciences (GIMS) and Shah Abdul latif University (SALU), Khairpur Mir's

Data Collection and Questionnaire

A Structured survey was employed with an emphasis on Age, Gender, Marital status, Occupation, and level of education comes under demographic traits. History of exposure (Surgery, Blood transfusion, Family history, awareness, and cleanliness) and Hepatitis type and symptoms (Beg & Kharal, 2010; Shaikh et al., 2024; Soomro et al., 2025). Data was analyzed using MS Excel 2013, Statistix 8.0.

RESULTS

Demographics characteristics

A total of 500 confirmed hepatitis patients were included in the study. Of these, 79% were male and 21% were female. The majority of cases were observed among teenagers and young adults, who together accounted for 60% of the study population, indicating a higher prevalence of viral hepatitis in younger age groups. Regarding marital status, 56% of participants were unmarried, while 44% were married. Educational status varied among

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ISSN: (e) 3007-1607 (p) 3007-1593

respondents, with most having attained secondary education (57%), followed by those with primary education or no formal schooling (37%). In terms of occupation, a substantial proportion of participants were unemployed (57%) or housewives (15%), reflecting limited involvement in formal employment sectors. The remaining participants were engaged in formal employment (18%) or business activities (10%). The demographic data is discussed in table 1.

Risk factors

Participants reported multiple potential exposure factors. A history of blood transfusion was reported by less than half of the patients (44%). Additionally, 50% of respondents indicated that a family member had previously been diagnosed with hepatitis, suggesting a substantial role of household or intrafamilial transmission. Surgical procedures did not appear to be a major exposure route in this study, as 88% of participants reported no prior history of surgery Access to clean drinking water was reported by 66% of the participants (Table 1). Despite this, a considerable knowledge gap was identified, with 69% of respondents lacking awareness of hepatitis transmission routes (Table 1).

Frequency of viral hepatitis and symptoms

Among the diagnosed cases, hepatitis C virus (HCV) infection was the most prevalent, followed by hepatitis B virus (HBV). Commonly reported symptoms included fever, fatigue, jaundice, nausea, joint pain, abdominal discomfort, and dark-colored urine, all of which are characteristic clinical manifestations of viral hepatitis (Table 1).

Table 1. Demographic Characteristics, Risk factors, and clinical profile of Hepatitis patients

Category	Variables	Percentage
Demographics	Male	79%
	Female	21%
	Young adults	60%
	Single	56%
	Married	44%
	Secondary Education	57%
	Primary Education	21%
	Unemployed/Housewives	72%
	Businessmen/Employed	28%
Risk Factors	History of Blood transfusion	44%
	Family member with Hepatitis	50%
	No history of surgery	88%
	Access to clean drinking water	66%
	Lack of awareness about Transmission	69%
Types of Hepatitis	Hepatitis C	60%
	Hepatitis B	38%

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ISSN: (e) 3007-1607 (p) 3007-1593

	Hepatitis A	2%
Common symptoms	Fever	30%
	Fatigue	22%
	Jaundice	10%
	Abdominal pain	15%
	Nausea	5%
	Joint Pain	8%
	Dark urine	2%

DISCUSSION

The findings of this study demonstrate that viral hepatitis particularly hepatitis C virus (HCV) remains a substantial public health concern in the Khairpur region. The higher prevalence of HCV compared to hepatitis B virus (HBV) aligns with national epidemiological trends, as Pakistan is consistently reported among countries with the highest global burden of HCV infection (Quaglio et al., 2008; Polaris, 2020; Mailto et al., 2024). Previous national surveys and epidemiological studies have attributed this burden to persistent unsafe medical practices, inadequate infection-control measures, and limited public awareness regarding hepatitis transmission (Ali et al., 2009; Samo et al., 2020). The present findings therefore reinforce established patterns of viral hepatitis distribution in Pakistan.

A notable demographic trend observed in this study was the predominance of male patients, who constituted 79% of the study population. Similar gender disparities have been documented in previous Pakistani and regional studies, where males are more frequently exposed to invasive medical procedures, occupational hazards, and informal healthcare settings, increasing their susceptibility to hepatitis infections (Qureshi et al., 2010). Sociocultural factors, including reduced healthcare-seeking behavior and underdiagnosis among women, may further contribute to this imbalance (Bozorgi et al., 2012). Thus, the gender distribution observed here is consistent with existing literature.

The finding that teenagers and young adults represented the majority of infected individuals is particularly concerning. Early-age infection significantly increases the duration of chronic disease and the risk of long-term complications such as liver cirrhosis and hepatocellular carcinoma (Alberts et al., 2022). Studies conducted in Pakistan and other developing countries have linked early exposure to unsafe injection practices, reuse of syringes, and unregulated dental or medical procedures (Ali et al., 2009; WHO, 2017). These observations suggest that systemic healthcare deficiencies may be driving hepatitis transmission among younger populations.

Risk factor analysis further highlights the role of blood transfusion and household contact in hepatitis transmission. In this study, 44% of participants reported a history of blood transfusion, consistent with national reports identifying transfusion-related transmission as a significant contributor to HBV and HCV infections in Pakistan, particularly where screening practices are inadequate (Calderón et al., 2009; Qureshi et al., 2010; Samo et al., 2020:). Additionally, half of the respondents reported having an infected family member, indicating a substantial role of household or intrafamilial transmission, a phenomenon well documented in hepatitis epidemiology (Bozorgi et al., 2012).

Although 66% of participants reported access to clean drinking water, this factor did not appear to influence HBV or HCV prevalence. This finding aligns with established evidence that HBV and HCV are primarily blood-borne viruses rather than waterborne pathogens (WHO, 2017). Consequently, the persistence of hepatitis in this region is more strongly associated with unsafe medical practices than with environmental sanitation. Similar conclusions have been reported in studies conducted in Sindh and other South Asian regions (Tran et al., 2003; SHD, 2021).

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ISSN: (e) 3007-1607 (p) 3007-1593

A significant gap in public health literacy was also identified, as 69% of respondents lacked basic knowledge regarding hepatitis transmission routes. Low awareness has repeatedly been recognized as a major barrier to hepatitis prevention in Pakistan and other low- and middle-income countries (Bozorgi et al., 2012; WHO, 2017). Individuals with limited health education are more likely to engage in high-risk behaviors, such as receiving injections from unqualified practitioners or undergoing unsafe procedures (Ali et al., 2009; Alqahtani & Colombo 2020). The present findings therefore corroborate existing evidence linking poor awareness to increased transmission risk.

The clinical symptoms reported by participants including fatigue, jaundice, nausea, abdominal discomfort, and dark urine are consistent with the classical clinical presentation of viral hepatitis described in previous diagnostic and clinical studies (Sim et al., 2008; Wu et al., 2022). However, it is well recognized that a large proportion of individuals with chronic HBV or HCV remain asymptomatic for extended periods, underscoring the importance of population-level screening to identify undiagnosed cases (WHO, 2017; Jadoul et al., 2019).

Overall, the findings of this study point toward persistent systemic weaknesses in healthcare delivery, including unsafe injection practices, inadequate sterilization, insufficient blood screening, and low public awareness, all of which continue to fuel hepatitis transmission in Pakistan (Ali et al., 2009; Samo et al., 2020). Household transmission, limited vaccination coverage, and delayed diagnosis further compound the problem (Qureshi et al., 2010; WHO, 2017). These results are consistent with studies conducted across Sindh and other provinces, highlighting the urgent need for strengthened infection-control policies, public education campaigns, and expanded screening and vaccination programs to reduce the burden of viral hepatitis (SHD, 2021; Polaris, 2020).

CONCLUSION

The present study reveals that viral hepatitis, particularly Hepatitis C, is a substantial public health concern in the Khairpur region. The community's continued exposure to avoidable risk factors is shown by the higher frequency among males and younger age groups. Key causes such as improper blood transfusions, close household contact with infected persons, inadequate health education and limited awareness of transmission pathways reveal continuing gaps in local healthcare practices and public knowledge. The majority of participants reported having access to clean drinking water, but the general lack of knowledge about hepatitis prevention suggests that environmental improvements by themselves are not enough to stop transmission.

These results highlight the critical need for focused public health interventions, such as improved screening programs, enforcement of safe injection and transfusion procedures, and increased community education campaigns.

Recommendations

Targeted awareness campaigns should be implemented to improve public knowledge of hepatitis transmission and prevention. Regular screening programs in healthcare facilities are essential for early detection and treatment. Strict adherence to safe medical practices, including sterilization and injection safety, must be enforced. Hepatitis B immunization coverage should be expanded, along with stronger regulation of blood transfusion services. Additionally, unnecessary injections should be minimized and long-term research conducted to monitor changing hepatitis trends.

Acknowledgement

Authors are thankful to (KMC Civil hospital Khairpur Mir's, PAQSJIMS/ GIMS, Gmabat and SALU, Khairpur Mir's. Additionally authors acknowledge Shaista Abbasi, Rizwan Khan Shaikh, Ghaffar Ahmed Ujan, Hasnain Gul Janwari, Bahadur Ali Soomro, and Zeeshan Rahman Seelro for helping us in survey.

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ISSN: (e) 3007-1607 (p) 3007-1593

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