

Original Research Article

Assessment of knowledge, attitude and practices regarding hepatitis C virus disease among university students: a cross-sectional study

Pahari Chetia¹, Sonia Bhonchal Bhardwaj^{2*}, Manoj Kumar¹

¹Centre for Public Health, Panjab University, Chandigarh, India

²Department of Microbiology, Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh, India

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*Correspondence:

Dr. Sonia Bhonchal Bhardwaj,

E-mail: sb.bhardwaj919@gmail.com

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ABSTRACT

Background: Hepatitis C virus (HCV) remains a significant public health issue in India due to lack of awareness. This research assessed the knowledge, attitudes and practices of university students regarding HCV.

Methods: A cross-sectional study design was conducted among 390 students. Random sampling technique was used to select the participants. Data was collected by using a questionnaire included four sections which are demographic, knowledge, attitude and practices and were analyzed using descriptive statistics and chi-square tests

Results: Although majority of the students (65.6%) had heard of HCV and 60.8% correctly identified it as a viral liver infection, many misconceptions persisted including the belief that a vaccine is available (55.7%). Risky behaviors such as receiving injections from unregistered practitioners (8.7%) and sharing personal items (39.5% not always avoiding) were reported. A significant association was found between education level and comfort in interacting with HCV-positive individuals ($p=0.006$).

Conclusions: These findings highlight the urgent need for targeted educational interventions to improve awareness and reduce stigma regarding HCV disease.

Keywords: Hepatitis C, Knowledge, Attitude, Practices, University students

INTRODUCTION

Hepatitis C virus (HCV) was first discovered in 1989 through molecular biology tools while a study was done on infected animal serum samples.¹ Later, it was identified as a ribonucleic acid (RNA) within *Flaviviridae* family under the *Hepacivirus* genus.² Although HCV primarily transmits through exposure to blood, other common routes are blood products, unsafe needles, unprotected sexual contact and mother to child transmission. High risk population for HCV infection include individuals living with HIV (PLHIV), those undergoing maintenance haemodialysis (MHD), and people who inject drugs (PWID). As most acute cases are asymptomatic, it is difficult to differentiate between

recent and chronic cases, hence assessing new cases of HCV infections remains as a challenge and lack of acute cases in many countries exist.³

According to the World Health Organization, globally 50 million people approximately live with chronic HCV, with one million new cases reported each year. HCV-related complications such as cirrhosis and liver cancer result in an estimated 242,000 deaths annually. Despite the existence of highly effective direct-acting antivirals (DAAs), which cure over 95% of cases, many people still lack access to timely diagnosis and treatment.⁴

India's estimated HCV prevalence ranges from 0.5% to 1.5%.⁵ Even a low prevalence translates into a significant

disease burden due to its large population.⁶ One of the major barriers for effective control of Hepatitis C is the limited knowledge regarding the HCV disease among healthcare provider and the general population.⁷ Research indicates that risky behaviour is highly prevalent among youth, highlighting the need for focused interventions. These behaviours not only carry significant health and psychosocial risks but are also frequently associated with multiple overlapping risk factors.^{8,9}

In this context, it is vital to evaluate public knowledge and awareness about hepatitis C, including its transmission routes, preventive measures and the importance of early screening. Addressing these knowledge gaps is essential for strengthening public health initiatives and contributing to global efforts aimed at eliminating hepatitis C.¹⁰

METHODS

Study designs

A cross-sectional study design was selected to assess the knowledge, attitude and practices (KAP) regarding HCV disease among students of Panjab University from March 2025 to July 2025.

Data collection tool

A questionnaire was used to collect data. The questionnaire included four sections which are regarding demographic, KAP.

Response options included multiple-choice or dichotomous types, except for some questions where used a 5-point Likert scale (“strongly agree” to “strongly disagree”) used. Multiple selections were permitted for items addressing common mode of transmission and symptoms of HCV disease.

Sampling design

Random sampling technique was used to ensure proportional representation of students from different departments.

Target population

University students from various disciplines, age group and academic years were included in the study to ensure the diverse representation of the population. Students from departments such as arts, science, law, dental, engineering etc. were included.

Sample size

Sample size of 384 was calculated considering a 0.06% prevalence from previous study. ($N=4pq/L^2$, $q=0.06$ and the level of confidence was aimed to be 95% Where ‘p’ is

the prevalence from previous study, ‘q’ is (1-p) and L is the level of precision).

Inclusion criteria

University students currently enrolled in undergraduate, post graduate programs or PhD programs were included.

Exclusion criteria

Students who were unable or unwilling to complete the survey were excluded.

Data processing and analysis

Data was organized into Microsoft excel and subsequently analyzed using SPSS version 22 (IBM Corporation, Armonk, NY, 2013). Descriptive analytical statistics were used to summarize the socio-demographic variables and KAP questions. Chi-square tests were performed to assess association between socio-demographic characteristics and key KAP outcomes.

Ethical consideration

Ethical clearance of the study was obtained from the ethical committee of Department of Public Health, Panjab University, Chandigarh. Participation was entirely voluntarily and written consent was obtained from all the respondents after clearly explaining the objectives and procedures of the study.

RESULTS

Table 1 depicts the socio-demographic characteristics of the participants. A total of 390 university students participated in the study, offering a rich and diverse data set representing young adults from multiple academic disciplines. The majority of respondents (90.5%) were aged between 18 and 25 years, ensuring that the insights are particularly relevant to the youth demographic as a group considered crucial in public health outreach efforts. Gender distribution was balanced with 51% males and 49% females and nearly all participants (97.7%) were unmarried. Educational background varied, with 56.9% enrolled in undergraduate programs, 41.5% in postgraduate courses, and 1.5% pursuing doctoral studies. Most students (52.4%) resided in university hostels while the remainder were day scholars or paying guests. Additionally, a considerable portion of respondents (62.8%) belonged to urban areas, whereas 37.2% came from rural backgrounds. This demographic spread reinforces the study’s capacity to generalize findings across varied youth settings.

Table 2 shows out of 390 respondents, 65.6% reported having heard about HCV. However, 34.4% had never heard of it. Only 60.8% correctly identified HCV as a viral liver infection, while 16.2% mistook it for bacterial disease, and others associated it with unrelated conditions

like fever (5.6%) or kidney failure regarding modes of transmission, the most frequently identified were sharing needles (58.2%), blood transfusion (54.1%), and tattooing/piercing with unsterilized equipment (50.2%). However, 10.2% unaware of any transmission route. As for symptoms, awareness varied. Fever (42.5%),

abdominal discomfort (40.7%), and jaundice (35.9%) were the most commonly mentioned. Yet, 25.8% did not know any symptoms. Importantly, 51.5% recognized that HCV can be asymptomatic in early stages. Alarming, 55.7% mistakenly believed that a vaccine exists for HCV, indicating poor knowledge gap (Figure 1).

Table 1: Socio-demographic characteristics (n=390).

Characteristics	N	Percentage (%)
Age (in years)		
Under 18	5	1.3
18-25	353	90.5
Above 25	32	8.2
Gender		
Male	199	51
Female	191	49
Marital status		
Married	9	2.3
Unmarried	381	97.7
Education level		
Undergraduate	222	56.9
Postgraduate	162	41.5
Doctorate	6	1.5
Current living arrangement		
Day scholar	106	27.2
Hosteller	204	52.4
Paying guest	80	20.5
Place of residence		
Rural	145	37.2
Urban	245	62.8

Table 2: Knowledge regarding HCV disease.

Characteristics	N	Percentage (%)
Have you heard about HCV disease?		
No	134	34.4
Yes	256	65.6
What is HCV disease?		
Bacterial disease	63	16.2
Don't know	21	5.4
Fever	22	5.6
Kidney failure	47	12.1
Viral liver infection	237	60.8
The common modes of transmission of HCV disease (multiple choice)		
Blood transfusion	211	54.1
Sharing needles	227	58.2
Sharing razor	102	26.1
Tattooing/piercing with unsterilized equipment	196	50.2
Unprotected sexual contact	133	34.1
Don't know	40	10.2
The common symptoms of HCV disease (multiple choice)		
Abdominal pain or discomfort	159	40.7
Dark urine	103	26.4
Fever	166	42.5
Don't know	101	25.8
Fatigue	129	33.1
Jaundice	140	35.9
Nausea or vomiting	149	38.2

Continued.

Characteristics	N	Percentage (%)
In early stages, HCV disease is		
Asymptomatic	201	51.5
Don't know	24	6.2
Symptomatic	165	42.3

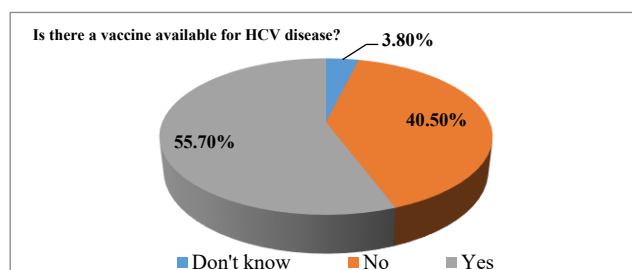


Figure 1: Knowledge regarding vaccine availability.

From the Table 3, it can be seen that 46.7% of students agreed and 15.9% strongly agreed that HCV is a serious disease. However, substantial proportion (27.7%) remained neutral, and a small number (5.6%) disagreed. About 56.7% considered it extremely important to encourage at-risk individuals to get tested, while 37.7%

found it moderately important. Only 5.4% considered it not important. Regarding stigma, 41.5% believed it prevents people from seeking treatment “a lot,” and 34.6% believed it impacts behaviour “somewhat” in a large majority (Table 3).

In Table 4, it was also demonstrated that only 6.9% had ever been tested for HCV. When receiving injections or medical procedures, 43.3% always ensured the use of sterile needles, while 27.7% never did so. Notably, 8.7% had received injections from unregistered practitioners, and 7.9% admitted to experimenting with intravenous drugs. A significant portion (34.4%) had undergone tattooing or piercing, but only 18.2% confirmed sterile equipment was used, and 9% were unsure. When it comes to sharing personal items like razors or toothbrushes, 60.5% always avoided it, but 39.5% did so inconsistently (with 6.2% never avoiding).

Table 3: Attitude towards HCV disease.

Characteristics	N	Percentage (%)
Do you think hepatitis is a serious disease		
Agree	182	46.7
Disagree	22	5.6
Don't know	1	.3
Neutral	108	27.7
Strongly Agree	62	15.9
Strongly disagree	15	3.8
Have you any household member who has/had HCV disease?		
No	377	96.7
Yes	13	3.3
Would you feel comfortable interacting with someone who has HCV disease?		
Comfortable	95	24.4
Don't know	1	.3
Neutral	180	46.2
Uncomfortable	63	16.2
Very comfortable	33	8.5
Very uncomfortable	18	4.6
How important do you think to encourage someone to get tested for HCV disease if they are at risk?		
Don't know	1	.3
Extremely important	221	56.7
Moderately Important	147	37.7
Not important	21	5.4
To what extent does stigma prevent people from seeking treatment?		
A little	68	17.4
A lot	162	41.5
Don't know	5	1.3
Not at all	20	5.1
Somewhat	135	34.6
Should educational institutions conduct mandatory health awareness programs on HCV disease?		
Yes	331	84.9
No	57	14.6
Not sure	2	0.5

Table 4: Practices towards HCV disease.

Characteristics	N	Percentage (%)
Have you ever been tested for HCV disease		
Yes	27	6.9
No	363	93.1
When getting medical procedures (e. g., injections), do you ensure that needles and syringes are sterile?		
Always	169	43.3
Never	108	27.7
Sometimes	113	29.0
Have you ever received injection from unregistered medical practitioners?		
Yes	34	8.7
No	356	91.3
Experimenting with injecting drug intravenously, even if only once?		
Yes	31	7.9
Never	359	92.2
Have you ever received a tattoo or piercing?		
Yes	134	34.4
No	255	65.4
If yes, was sterile equipment used?		
Yes	71	18.2
No	4	1.0
Not sure	35	9.0
Do you avoid sharing personal items like razors or toothbrushes to prevent infections?		
Always	236	60.5
Never	24	6.2
Often	54	13.8
Rarely	22	5.6
Sometimes	53	13.6

Association with academic background

Table 5 shows despite a visible trend of increasing awareness with higher education levels; the association found to be statistically non-significant ($p=0.521$). This indicates that although higher educational attainment may contribute to better awareness, it was not significantly associated with knowledge of HCV in this sample.

A statistically significant association was observed between educational level and respondents' comfort in interacting with individuals who have HCV ($p=0.006$). Postgraduate and doctoral students were more likely to feel comfortable or very comfortable in such interactions, while undergraduates were more likely to express discomfort or neutrality. This highlights the role of advanced education in reducing stigma and promoting empathetic attitudes toward individuals living with HCV.

Although the association between education level and avoidance of sharing personal hygiene items was not statistically significant, a favourable trend emerged. Students with higher educational qualifications were more inclined to avoid risky practices such as sharing razors or toothbrushes which are indirect modes of HCV transmission. This trend suggests that health knowledge improves with education, and while not always sufficient to alter behaviour on its own, it forms a strong foundation for behavioural interventions.

Table 6 indicates it can be determined a borderline statistically significant association between place of permanent residence and attitude toward HCV with a $p=0.050$. This suggests that participants from rural and urban areas may differ in their attitudes, although the relationship is weak. Urban residents were more likely to exhibit a positive attitude (8.6%) compared to their rural counterparts (3.4%). No significant associations were found between knowledge levels and any demographic variables, including age ($p=0.655$), gender ($p=0.665$), marital status ($p=0.379$), education level ($p=0.776$), current living arrangement ($p=0.243$), or place of residence ($p=0.926$). Similarly, no statistically significant associations were identified between practice and demographic characteristics such as age ($p=0.461$), gender ($p=0.254$), marital status ($p=0.409$), education level ($p=0.912$), current living arrangement ($p=0.533$), or place of residence ($p=0.840$).

Figure 2 shows that majority of respondents (63.8%) demonstrated awareness of key aspects of HCV, reflecting a moderate level of knowledge and indicating that health education initiatives may be having some impact. However, despite this awareness, a significant proportion (93.3%) exhibited negative or indifferent attitudes toward HCV, potentially undermining prevention efforts. This reveals a clear disconnect between knowledge and attitude. Additionally, more than

half of the participants (53.1%) reported engaging in unsafe practices, highlighting a public health concern.

These findings suggest that knowledge alone may not be sufficient to drive safe behaviours (Figure 2).

Table 5: Association with education level.

Variables	Education level			P value
	Doctorate	Postgraduate	Undergraduate	
Have you heard about HCV?				>0.05
No	1	53	80	0.521
Yes	5	109	142	
Would you feel comfortable interacting with someone who has HCV disease?				<0.05
Very comfortable	2	18	13	0.006
Comfortable	4	43	48	
Neutral	0	78	102	
Uncomfortable	0	19	44	
Very uncomfortable	0	4	14	
Don't know	0	0	1	
Do you avoid sharing personal items like razors or toothbrushes to prevent infections?				>0.05
Never	0	5	19	0.056
Often	2	29	23	
Rarely	1	12	9	
Sometimes	0	20	33	
Always	3	96	138	

Table 6: Association between characteristic variables and KAP.

Variables		Knowledge, N (%)			Attitude, N (%)			Practice, N (%)		
		Good	Poor	P value	Good	Poor	P value	Good	Poor	P value
Age (in years)	<18	4 (80)	1 (20)	0.655	1 (20)	4 (201)	0.149	3 (60)	2 (40)	0.461
	18-25	226 (64)	127 (36)		25 (7.1)	328 (92.9)		168 (47.6)	185 (52.4)	
	>25	19 (59.4)	13 (40.6)		0 (0)	32 (100)		12 (37.5)	20 (62.5)	
Gender	Female	124 (64.9)	67 (35.1)	0.665	17 (8.9)	174 (91.1)	0.083	84 (44)	107 (56)	0.254
	Male	125 (62.8)	74 (37.2)		9 (4.5)	190 (95.5)		99 (49.7)	100	
Marital status	Married	7 (77.8)	2 (22.2)	0.379	0 (0)	9 (100)	0.417	3 (33.3)	6 (66.7)	0.409
	Unmarried	242 (63.5)	139 (36.5)		26 (6.8)	364 (93.2)		180 (47.2)	52.8 (207)	
Education level	Undergraduate	142 (64)	80 (36)	0.776	14 (6.3)	208 (93.7)	0.734	106 (47.7)	116 (52.3)	0.912
	Post graduate	104 (64.2)	58 (35.8)		12 (7.4)	150 (92.6)		74 (45.7)	88 (54.3)	
	Doctorate	3 (50)	3 (50)		0 (0)	6 (100)		3 (50)	3 (50)	
Current living arrangement	Day scholar	63 (59.4)	43 (40.6)	0.243	8 (7.5)	98 (92.5)	0.778	45 (42.5)	61 (57.5)	0.533
	Hosteller	129 (63.2)	75 (36.8)		14 (6.9)	190 (93.1)		98 (48)	106 (52)	
	Paying guest	57 (71.2)	23 (28.8)		4 (5)	76 (95)		40 (50)	40 (50)	
Place of permanent residence	Rural	93 (64.1)	52 (35.9)	0.926	5 (3.4)	140 (96.6)	0.050	69 (47.6)	76 (52.4)	0.840

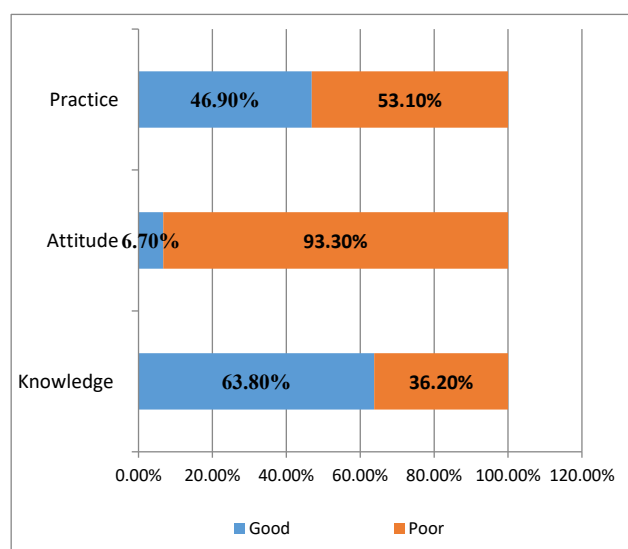


Figure 2: Level of KAP among students.

DISCUSSION

This research aimed to evaluate the KAP concerning HCV while various studies have previously examined KAP levels among specific high-risk populations but there has been limited focus on youth populations particularly in northern India. In the present study, 65.6% of students had heard about HCV. While this suggests a moderate level of awareness, it is concerning that more than one-third (34.4%) remained unaware of the disease despite being part of a higher education environment. Furthermore, only 60.8% correctly identified HCV as a viral liver infection. Misconceptions were common: 16.2% believed it to be a bacterial disease, 12.1% associated it with kidney failure, and 5.4% were uncertain. These findings resonate with Ha and Timmerman who reported inadequate HCV knowledge even among healthcare workers and the general public.¹¹ Participants showed partial understanding of HCV transmission. Although the majority identified sharing needles (58.2%) and blood transfusions (54.1%) as transmission routes, fewer recognized tattooing/piercing (50.2%) or unprotected sex (34.1%) as risk factors. Notably, only 26.1% considered sharing razors a possible transmission route. These gaps are consistent with international findings from Shalimar et al who emphasized the under appreciation of indirect and sexual transmission routes.¹² Similar knowledge deficiencies were also observed in tribal and rural communities in India, as noted by Kar et al.¹³

Symptom knowledge was also limited. The most commonly recognized symptoms were fever (42.5%), abdominal pain (40.7%), and nausea/vomiting (38.2%). Classic symptoms such as jaundice (35.9%) and fatigue (33.1%) were less frequently noted, while dark urine which is a typical indicator was mentioned by only 26.4%. Alarming, 25.8% of students were unaware of any symptoms, echoing concerns raised by Dhiman et al

regarding delayed diagnosis due to symptom misrecognition.¹⁴ Only 51.5% correctly identified HCV as asymptomatic in early stages, while 42.3% believed it was symptomatic, and 6.2% were unsure. This reflects similar gaps seen in other Indian cohorts studied by Mukherjee et al.¹⁵

One of the most critical misconceptions found was that 55.7% of students believed a vaccine for HCV exists. Only 40.5% correctly responded that there is no vaccine. This confusion aligns with findings by Kaushal et al who demonstrated that educational interventions significantly reduced such misinformation in school settings, and is consistent with findings from Abrol et al on medical students' misconceptions regarding hepatitis C.^{16,17}

Interestingly, the association between educational level and awareness of HCV was not statistically significant ($p=0.521$). This suggests that knowledge deficiencies are not limited to undergraduate students but are present across all academic levels, highlighting a need for systematic education regardless of academic background. These findings align with the findings of Kumar et al who reported that even among medical students, individuals expected to have higher baseline awareness though there were notable gaps in knowledge about hepatitis B and C.¹⁸ Their study emphasized that merely being in a health-related academic program does not guarantee adequate awareness or understanding of viral hepatitis. These findings collectively figure out the need to integrate comprehensive HCV education into all academic curricula including health sciences, to ensure consistent awareness across the educational spectrum.

Students' attitudes reflected both awareness and areas needing improvement. About 62.6% recognized Hepatitis C as a serious condition, yet 27.7% were neutral, and nearly 10% disagreed or strongly disagreed. This ambivalence may hinder engagement with preventive health measures. Only a minority (8.5%) felt very comfortable interacting with HCV-positive individuals, while 46.2% remained neutral. Educational level was significantly associated with greater comfort ($p=0.006$), implying that advanced academic exposure reduces stigma. Similar findings have been reported by El-Sayed et al and Diotaiuti et al emphasizing that higher education positively influences social acceptance and empathy toward infected individuals.^{19,20}

56.7% believed it is extremely important to motivate at-risk individuals to get tested, and 37.7% considered it moderately important. This support indicates a general willingness to promote public health. Still, stigma remains a barrier: 41.5% said stigma largely prevents treatment-seeking, and 34.6% said it affects behaviour to some degree. Similar findings were corroborated in a meta-analysis by Alonso et al who highlighted stigma as a major deterrent in HCV testing and treatment adherence.²¹

A notable highlight was that 84.9% of respondents supported mandatory health awareness programs in educational institutions. This finding demonstrates strong student interest in structured health promotion efforts and underscores the potential for institutional interventions.

While awareness levels were moderate, preventive practices did not consistently align. Only 6.9% of students had ever been tested for HCV. This discrepancy between knowledge and action has been observed in previous studies, such as Patil et al who reported similar gaps in youth testing rates despite free services under NVHCP.²²

When it came to safe medical practices, only 43.3% of students always ensured the use of sterile needles and syringes, while 27.7% never did. Additionally, 8.7% had received injections from unregistered practitioners. These practices pose major risks and reflect systemic healthcare access challenges in India as highlighted by Tandon et al and Kumar et al.^{23,24}

Among the participants, 7.9% admitted to experimenting with intravenous drug use one of the highest-risk behaviours for HCV transmission. This is a cause for concern, as injecting drug use is a well-established route for blood borne infections due to needle-sharing practices. Verma et al noted that the burden of HCV-related chronic liver disease is particularly high in North India, with specific genotypes predominating among patients who report parenteral exposures, including intravenous drug use.²⁵ This reinforces the urgent need for youth-focused harm reduction programs, such as needle exchange and counselling services, especially in urban and semi-urban areas where experimentation with drugs may be increasing.

Tattooing and body piercing were reported by 34.4% of students, but only 18.2% confirmed the use of sterile equipment, and 9% were unsure. This highlights a substantial gap in understanding safe practices and infection control. Anjum et al found similar trends among university students in South Delhi, where risky cosmetic procedures were undertaken without proper knowledge of infection risks.²⁶ Their study emphasized that while awareness of HCV existed, the translation into safe practices was minimal, largely due to misconceptions and the informal nature of service providers offering these procedures. Educational interventions need to include safe body modification practices, targeting both students and informal tattooing practitioners.

The data on tattooing and body piercing is a sign of a deeper issue of inadequate health literacy and passive risk-taking behaviour. Mukhopadhyay highlighted that the silent progression and asymptomatic nature of HCV often result in public underestimation of the disease's seriousness.²⁷ In such contexts, minor oversights like failing to confirm the sterility of instruments can have long-term health consequences. Greater emphasis is

needed on informed consent, awareness of transmission routes, and promoting a culture of proactive health questioning among youth, particularly when engaging with practices involving skin penetration.

The observed disconnect between KAP regarding HCV among youth emphasizes a broader trend documented in the literature. While 63.8% of participants demonstrated a moderate level of awareness, this did not translate into positive attitudes or safe behaviours consistent with Shepard et al who argued that knowledge dissemination alone does not ensure behaviour change in public health interventions.²⁸ The borderline significant association between place of residence and attitude ($p=0.050$) suggests that geographic and possibly cultural factors may subtly influence perceptions toward HCV. This observation aligns with Narahari et al who reported that the prevalence and genotypic distribution of HCV vary significantly across regions in India, indicating underlying regional disparities in exposure, awareness, and possibly health-seeking behaviours that could shape attitudes toward the disease.²⁹

CONCLUSION

The study highlights key knowledge gaps, mixed attitudes, and inconsistent preventive practices related to HCV among university students. Although some positive trends were observed, particularly among students with higher education levels, widespread misconceptions regarding vaccine (55.7%) and risky behaviours persist. While a majority of students demonstrated good knowledge (63.80%), there is a noticeable gap in practices (46.90%) and especially in attitude (6.7%). These findings reinforce the need for comprehensive, evidence-based HCV awareness programs that are integrated into academic environments and tailored to address youth-specific perceptions and behaviours.

Recommendations

Based on the findings of this study, the following recommendations are proposed to improve awareness, attitudes, and preventive practices regarding HCV among university students. Comprehensive health education, awareness campaign by public health experts and peer educators through workshops, sessions, and digital tools that can aid information spread should be included in university curricula, especially for non-medical students, to address knowledge gaps. Awareness campaigns by public health experts and peer educators through workshops, sessions, and digital tools that can aid information spread. Universities and health departments must collaborate on regular HCV screenings to encourage early detection. Misconceptions and stigma should be tackled using culturally sensitive, inclusive communication. Lastly, further research is needed to identify barriers to knowledge and behavior change among diverse student groups.

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