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Impact of educational interventions on hepatitis B and C awareness among school students of Delhi NCR, India

Kanica Kaushal[1*], Priyanka Aggarwal[1], Neha Dahiya[2] and Guresh Kumar[3]

Abstract

Background Viral hepatitis, particularly B and C, is a major cause of liver cirrhosis and cancer, leading to about 1.4 million deaths annually. Alarmingly, less than 20% of those with hepatitis are aware of their status, with only 6.3% receiving treatment. School children can play a pivotal role in raising awareness and preventing the spread of infections. This intervention study focuses on understanding and enhancing the knowledge, attitudes, and practices related to Hepatitis B and C, among school children in Delhi NCR to foster dialogue and awareness.

Methods An intervention study was conducted in selected schools across Delhi NCR between September and October 2022 to assess baseline knowledge, attitudes, and practices related to Hepatitis B and C. Three of seven schools were randomly selected by probability sampling, representing 9–12 grade students, and 901 students participated. Following this, an educational interventional program was conducted using educational material, interactive sessions, and audiovisual aids. Post-intervention assessments were done to measure the impact on knowledge improvement.

Results The study is expected to provide insights into the current level of awareness regarding Hepatitis B and C. Furthermore, the intervention's effectiveness was analysed using the pre-formed questionnaire. The average pre-test knowledge score was 8.9 ± 3.2, while the post-test average was 15.6 ± 4.4, indicating a substantial increase of 6.7 ± 4.7 points (+ 75.2%). There was a positive correlation of 0.240 between pre and post-test scores. Attitude change before and after the session showed a positive percentage change of + 38.0% with a correlation of 0.351. The study indicated substantial improvements in knowledge about hepatitis B and C, notably regarding awareness about transmission methods and risk factors.

Conclusion This interventional study seeks to bridge the knowledge gap among school children regarding Hepatitis B and C in Delhi NCR, fostering a proactive approach towards prevention, detection, and treatment. The considerable rise in awareness and favourable changes in perspectives post-intervention say that specific health education initiatives are pivotal in raising awareness and comprehension of infectious diseases, ultimately contributing to improving community health.

Keywords Knowledge, Attitude, Practice, Hepatitis B, Hepatitis C, Communicable disease, Schools, IndiaManuscript

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Background

Viral hepatitis, especially B and C, is among the leading causes of liver cirrhosis [1] and liver cancer [2]. It is responsible for an estimated 1.4 million deaths per year from acute infection and hepatitis-related liver cancer and cirrhosis – a toll comparable to that of HIV and tuberculosis [3]. Of those deaths, approximately 47% are attributable to hepatitis B virus, 48% to hepatitis C virus, and the rest to hepatitis A and E virus. Viral hepatitis is also a growing cause of mortality among people living with HIV. About 2.9 million people living with HIV are co-infected with hepatitis C virus and 2.6 million with hepatitis B virus [4]. What makes hepatitis a public health issue of grave concern is the fact that of these, less than one in five (17.9%, 45.6 million) people living with hepatitis were aware of their hepatitis status, and only 6.3% (16 million) received treatment [5].

Viral hepatitis is an international public health challenge, comparable to other major communicable diseases, including HIV, tuberculosis, and malaria. Despite the significant burden it places on communities across all global regions, hepatitis was largely ignored as a health and development priority until 2016. Viral hepatitis is a growing public health concern in India, with the exact burden remaining unclear due to limited data. India is classified within the intermediate endemicity zone for Hepatitis B, with a prevalence rate ranging from 2 to 7% and an average of 4%, resulting in a disease burden affecting approximately 50 million people [6]. A meta-analysis of published data shows that the prevalence of chronic Hepatitis B virus infection in India is 1.46%, with an estimated 17 million people being chronic carriers [7]. A comprehensive review shows that hepatitis B virus (HBV) prevalence ranges from 0.87 to 21.4%, while hepatitis C (HCV) prevalence ranges from 0.19 to 53.7% [8]. A review study found that the pooled anti-HCV seroprevalence rates in India were 0.85% among community-based studies, blood donors, and pregnant women [9]. Sustainable Development Goal (SDG) 3 aims to ensure healthy lives and promote well-being for all ages, with target 3.3 specifically targeting hepatitis, waterborne diseases, and other communicable diseases. This underscores the importance of combating viral hepatitis as a crucial component of achieving SDG 3 [10]. It was followed by the World Health Assembly endorsing the Global Health Sector Strategy (GHSS) for 2016–2021 on viral hepatitis that proposes to eliminate viral hepatitis as a public health threat by 2030, i.e., i.e. 90% reduction in new chronic infections and a 65% reduction in mortality compared with 2015 baseline [3, 11]. The GHSS on viral hepatitis for 2022–2030 [12] promotes disease-specific goals to end epidemics of viral hepatitis by 2030. The GHSS includes five strategic directions that guide priority actions by countries and WHO; one of the most important is engaging empowered communities and civil society for impact.

Competency is indispensable in the five core areas of intervention to fight the menace of hepatitis, i.e., prevention, testing, monitoring, management, and treatment [13]. Prevention and control strategies for viral hepatitis, such as raising awareness through public education, vaccination, blood transfusion safety strategies, early diagnosis, and effective medical support, can be implemented, and novel interventions have been available since 2018 after the National Viral Hepatitis Control Program launch in India. It becomes imperative to provide a better understanding of hepatitis among children of school-going age as they are the most critical stakeholders in the community. Implementing various hepatitis awareness campaigns and policy interventions targeted at the youth in their formative years is highly impactful because they function as active change agents. If a positive outlook is inculcated into their value system from a young age, it gets reinforced as positive behaviour formation as they grow up.

The present study has been designed to assess baseline knowledge, attitudes, and practices related to Hepatitis B and C among Delhi NCR school children and foster knowledge. This opportunity helped us generate dialogue about Hepatitis B and Hepatitis C among Delhi NCR school children and bring the concept of its transmission and prevention to light.

Methodology

This intervention study was conducted between September 2022 and October 2022 among school children in New Delhi to assess baseline knowledge, attitudes, and practices. The school's sample was randomly selected using a table of random numbers. Three out of seven schools in Delhi under the 'X' university were randomly selected based on the minimum clusters required from the sample size and the average number of students in that cluster. Sincere efforts were made to design this study by probability sampling so that the students are representative of the study population, i.e., 9–12 class students. Many students were contacted in one month to avoid contamination amongst the other schools under the same university. The informed consent was obtained from school authorities, parents, and participants. All the students from classes 9–12 consented to take part voluntarily with the assurance that all their responses were anonymous and they did not have prior knowledge or history of Hepatitis B and C. The students who were unavailable during data collection were also excluded from the study. No incentive was given to them to mark the responses. Student respondents were recruited in their auditorium hall (before the classes started). The pre-intervention phase featured developing

and administering a pre-designed questionnaire encompassing topics like socio-demographic details such as age, gender, religion, type of family with a total number of family members, parent's occupation, education level, and family income. Section "Background" covered questions on the knowledge domain, which had 26 questions with subtitles like causative agents, transmission, prevention, vaccination, symptoms, treatment, and complications of Hepatitis B and C. Section "Methodology" was the attitude domain, which had 15 questions with subtitles like modes of transmission, prevention, social discrimination, and treatment. The last section was the practice domain, which had four questions on screening, needle stick injuries, etc. After the collection of data, the subsequent intervention phase was conducted by healthcare professionals from the team who delivered sessions to students with educational materials, including brochures, posters, interactive sessions, and audio-visual aids aiming to enhance awareness and improve their knowledge and attitudes. The post-intervention phase replicated the pre-intervention phase using the same questionnaire to understand changes in knowledge and attitude. Inclusion criteria were being an active and registered school student from classes 9–12 of the selected school chain.

The sample size was estimated based on the findings of the level of knowledge about hepatitis B and C among school students in India. For sample size calculation, 95% was considered the confidence level, and 3% was the margin of error. As reported in an earlier study, 71% of school students had good to excellent knowledge regarding hepatitis. The minimum sample size was estimated to be 842. Assuming a 10% data loss, the revised sample size was 940. Statistical analysis was conducted to compare pre- and post-intervention results, stratified by demographic variables. Ethical consideration, including informed consent and data confidentiality, was strictly adhered to, with approval from the institutional ethics committee. Written informed consent was also obtained from all the parents of participating students.

Study tool

After necessary permissions from the chairman and school principals, it was decided to determine the knowledge, attitudes, and practices of class 9–12 students. The purpose and nature of the study were explained to the students. A self-designed, self-administered, pretested, structured (close-ended) anonymous questionnaire written in English was used as a study tool for data collection in this study. Content validity, face validity, and reliability tests were conducted on the questionnaire before it was used for this study. The questionnaire had sociodemographic details of the students and added 45 items grouped into knowledge, attitude, and practice sections. For each correct response, a score of "1" (one) and for the wrong "0" (zero) score was given. Each correct response was awarded a score of "1" for multiple correct answers. The minimum and maximum scores were 0 and 45, respectively. The maximum score for knowledge was 26, 15 for attitude and 4 for practice. A score of ≥ 13 was considered good knowledge, 6–12 as fair knowledge, and 0–5 as poor knowledge. A score of ≥ 7 was defined as a positive attitude and ≤ 7 as a negative attitude. A score of ≥ 2 was taken as safe practice and <2 as unsafe practice. The correct response sheet was shared with the participants via the nodal person. Following data collection, added queries from the participants relating to Hepatitis B and C were clarified by the investigator. After successfully submitting the proforma, an e-certificate of appreciation was provided to the participants.

Statistical analysis

SPSS version 22 was used for data analysis, and p value ≤ 0.05 was taken as statistically significant. A chi-square test was conducted to determine the association of independent variables with the outcome variable of interest (knowledge, attitude, and practice related to hepatitis B and C). Spearman's correlation was used to determine the correlation between knowledge of hepatitis B, knowledge of hepatitis C, attitude, and practice.

Results

Response rate

The completed and returned questionnaires were 901 and eligible respondents were 1026, giving an overall response rate of 87.8%. About 125 school students were not available during data collection.

Students from three schools across Delhi were enrolled in the study. Table 1 shows the socio-demographic profile of the participating students. Around a third of the respondents ($n=288$; 32%) belonged to Class 9, while 115 (12%) belonged to Class 12. Over two-thirds of the students lived in nuclear families ($n=628$; 69.7%). Both the parents of most of the students had higher levels of education (90.7% among fathers and 91.4% among mothers). Most students belonged to high-income households ($n=658$; 86.8%).

The participants' understanding of hepatitis B and C infection, including its causes, signs and symptoms, prevention methods, potential complications, vaccination, transmission routes, and treatment options, was evaluated.

The participants' understanding of hepatitis B and C infection, including its causes, signs and symptoms, prevention methods, potential complications, vaccination, transmission routes, and treatment options, was evaluated. Data about knowledge and attitude of hepatitis B and C among study participants are described in Tables 2

Table 1 Socio-demographic characteristics of the study population (*N* = 901)

Socio-demographic variables		Frequency	Percentage
Class	Class 9	288	32.0
	Class 10	241	26.7
	Class 11	257	28.5
	Class 12	115	12.8
Gender	Male	507	56.3
Religion	Hindu	808	89.7
	Muslim	41	4.6
	Sikh	29	3.2
	Christian	6	0.7
	Other	17	1.9
Type of family	Nuclear	629	69.8
Father's education[@]	Profession or Honours, Graduate or Post Graduate	770	90.7
	Intermediate, diploma, High school pass	73	8.6
	Middle school or below	6	0.7
Mother's education[#]	Profession or Honours, Graduate or Post Graduate	775	91.4
	Intermediate, diploma, High school pass	61	7.2
	Middle school or below	12	1.4
Total family Income[$] (in Rupees/month)	≥ 123,322	443	58.4
	61,663 – 123,321	215	28.4
	46129-61,662	42	5.5
	30,831 – 46,128	21	2.8
	18,497 – 30,830	20	2.6
	6,175 – 18,496	6	0.8
	≤ 6174	11	1.5

@ The figures given are from a total of 849 responses

The figures given are from a total of 848 responses

$ The figures given are from a total of 758 responses

and 3. In the pre-and post-intervention data, substantial knowledge improvements about hepatitis B and C were evident. General knowledge, such as major affected organs and the causative agent, increased from 80.4 to 95.0% and 27.6 to 80.9%, respectively. Awareness of transmission methods and risk factors notably improved, with risk factors like improper blood screening rising from 71.1 to 93.5%. Knowledge about other transmission methods, prevention items like personal protective equipment, organ/blood donation in Hepatitis B, needlestick injury management, and the disease most likely to spread through infected needles all showed gains. Participants proved improved understanding of vaccination schedules and symptoms and increased awareness of treatment options and long-term complications of Hepatitis C infection. A corresponding improvement was seen in the participants' attitudes following the awareness session in all parameters.

Table 4 shows the mean knowledge score of the participants pre-intervention was 8.9±3.2 (Fair knowledge), while post-intervention, it was 15.6±4.4 (good knowledge). There is a significant average difference of 6.7±4.7 points (+75.2%) between pre-and post-intervention study results and a positive correlation of 0.240. The percentage change in attitude before and after the session was +38.0%, and the correlation was 0.351. Linear regression showed that Post-test knowledge gain was 1.593 times more than the baseline value (Table 2).

An empirical analysis reveals a significant increase in the correlation between knowledge and attitude before and after the informative session. Pre-intervention correlation: 0.292 ($p<0.001$); Post-intervention correlation: 0.537 ($p<0.001$) (Fig. 1).

An independent t-test was performed to compare differences in knowledge, attitude, and practice between students when segregated based on gender and type of family. Attitude score among female students was significantly higher than males (7.4±3.1 vs. 6.8±3.3; $p=0.010$). Those living in nuclear families had a significantly higher mean level of knowledge as compared to those living in joint families (9.1±3.1vs 8.6±3.3; $p=0.05$) (Table 5).

Discussion

Around 400 million people all over the world suffer from chronic hepatitis and the Asia-Pacific region constitutes the epicentre of this epidemic [14]. India falls into the

Table 2 Knowledge of study participants about hepatitis B and C (*N* = 901)

Statement		Pre-Intervention		Post-Intervention	
		Correct Response	%	Correct Response	%
General Knowledge					
Major organs affected by hepatitis B and C		724	80.4	856	95.0
The causative agent of hepatitis		249	27.6	729	80.9
Modes of Transmission/Risk Factors					
Risk factors for transmission of Hepatitis B and C	Improper screening of blood and blood products?	641	71.1	842	93.5
	Frequent hospital visits?	396	44.0	511	56.7
	Interacting verbally with the patients of Hepatitis B or C?	405	45.0	592	65.7
	Infected mother to her child?	546	60.6	821	91.1
	Getting body piercings?	283	31.4	798	88.6
	Body tattooing?	260	28.9	773	85.8
	Sneezing/kissing/hugging/shaking hands?	282	31.3	450	49.9
	Sharing utensils?	316	35.1	495	54.9
	Sharing room?	367	40.7	584	64.8
	Using a common swimming pool?	309	34.3	533	59.2
Prevention					
Items that are part of personal protective equipment (PPE)		418	46.4	446	49.5
Organ/Blood Donation in Hepatitis B		540	59.9	552	61.3
Needle-stick injury management		281	31.2	335	37.2
Disease has the highest chance of spreading through infected needles		112	12.4	369	41.0
Vaccination					
Schedule for Hepatitis B immunization in children		361	40.1	536	59.5
Schedule for Hepatitis B immunization in children		59	6.5	513	56.9
Vaccination for Hepatitis C		176	19.5	620	68.8
Symptoms					
Common symptoms of Hepatitis C		178	19.8	485	53.8
Treatment					
Cure for Hepatitis B		148	16.4	607	67.4
Cure for Hepatitis C		337	37.4	617	68.5
Complications					
Long term complication of Hepatitis C infection		460	51.1	578	64.2

category of intermediate endemicity for Hepatitis B Virus (HBV) and the common genotypes reported from India are A followed by D [15]. A study by Lodha et al. from New Delhi depicted the prevalence of HBV infection in India as 1–2% [16].

The present study aimed to assess the factors associated with knowledge, attitude, and practice (KAP) related to Viral Hepatitis B and Hepatitis C among school children in Delhi NCR. The study results provide valuable insights into the awareness and perceptions of these diseases among the school-going population and shed light on the effectiveness of educational interventions in improving KAP related to Hepatitis B and C. Similar results have been shown by other studies done in school-based settings in India [17].

Socio-demographic factors

The socio-demographic profile of the students, as presented in Table 1, reflects the diversity in the sample. Most of the students belonged to nuclear families; a significant percentage of their parents had higher levels of education and came from high-income households. These demographic characteristics may have influenced the level of awareness and knowledge about Hepatitis B and C among the students, as previous studies have also suggested a positive correlation between education and

Table 3 Attitude of study participants hepatitis B and C (*N* = 901)

Statement	Pre-Intervention		Post- Intervention	
	Correct Response	%	Correct Response	%
Modes of Transmission/Risk Factors				
Believe that instrument sterilization is important to prevent transmission of Hepatitis B and C	544	60.4	716	79.5
Think that there is a possibility that one can get infected with Hepatitis B or C ever	335	37.2	517	57.4
Believe doctors/nurses who are Hepatitis B or C positive should not give health care services to patients	256	28.4	387	43.0
While caring for patients with Hepatitis B infection, it is one's responsibility to follow safety precautions	581	64.5	752	83.5
Prevention				
Would you get tested for Hepatitis B or C	486	53.9	699	77.6
Do you think that health education can be effective in preventing Hepatitis B and C	592	65.7	745	82.7
Do you think that Hepatitis B and C-positive patients should stay away from other family members	150	16.6	297	33.0
Do you think that both husband and wife should get tested for Hepatitis B and C before getting married	460	51.1	711	78.9
Do you recommend your friends and family for Hepatitis B and C screening	529	58.7	756	83.9
Would you ever participate in a health education program related to Hepatitis	576	63.9	717	79.6
Social Discrimination				
Will you meet a patient diagnosed with Hepatitis B or C	159	17.6	273	30.3
Think Hepatitis B and C patients should be isolated	168	18.6	349	38.7
Have any concerns about having casual contact or studying together with a chronic Hepatitis B infection patient in the same school	208	23.1	330	36.6
Treatment				
If a family member is diagnosed with Hepatitis, will he/she be encouraged for further investigation and treatment	539	59.8	715	79.4

Table 4 Mean score of study participants about knowledge and attitude towards hepatitis B and C (*N* = 901)

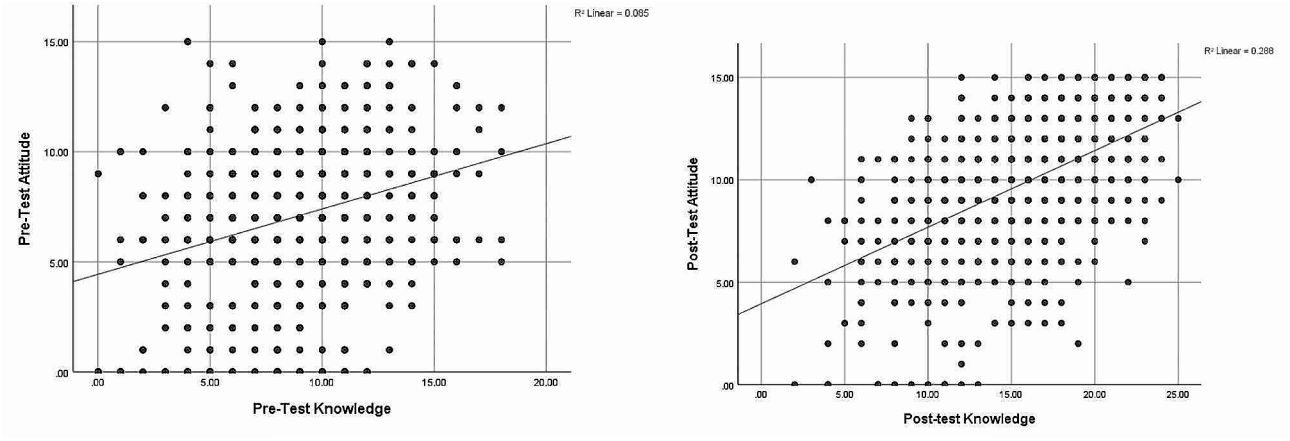
Parameter		Pre-intervention Score (mean ± SD)	Post-intervention Score (mean ± SD)	Mean Difference	Mean difference percentage	Correlation	*p*-value
Knowledge	Overall	8.9 ± 3.2	15.6 ± 4.4	6.7 ± 4.7	+ 75.2	0.240	< 0.001
	School 1	8.9 ± 3.0	15.9 ± 4.6	7.0 ± 4.9	+ 78.6	0.203	0.001
	School 2	8.7 ± 3.2	15.2 ± 4.3	6.5 ± 4.8	+ 74.7	0.219	< 0.001
	School 3	9.2 ± 3.3	16.0 ± 4.2	6.8 ± 4.5	+ 73.9	0.297	< 0.001
Attitude	Overall	7.1 ± 3.2	9.8 ± 3.0	2.7 ± 3.6	+ 38.0	0.351	< 0.001
	School 1	7.4 ± 2.9	9.5 ± 3.2	2.1 ± 3.8	+ 28.4	0.260	< 0.001
	School 2	6.7 ± 3.2	9.8 ± 2.9	3.0 ± 3.2	+ 44.7	0.459	< 0.001
	School 3	7.2 ± 3.5	10.1 ± 2.9	2.9 ± 3.8	+ 40.3	0.306	< 0.001

health awareness [17]. This study found that female students had a significantly higher attitude score than males, and students from nuclear families had higher knowledge levels than those from joint families. This observation is consistent with the results of other studies that have examined gender differences in knowledge and attitude and showed that gender can be a determinant of health knowledge, with females often displaying higher levels of health-related knowledge and more positive attitudes toward preventive measures [18].

Knowledge improvement

Knowledge about other transmission methods, prevention items like personal protective equipment, organ/blood donation in Hepatitis B, needle-stick injury management, and the disease most likely to spread through infected needles all showed gains. Participants showed improved understanding of vaccination schedules and symptoms, as well as increased awareness of treatment options and long-term complications of Hepatitis C infection.

One of the significant findings of our study was the substantial improvement in knowledge scores among the participants following the informative session. The mean knowledge score increased by 75.2% from the pre-test to the post-test, showing that the educational intervention effectively enhanced the participants' understanding of Hepatitis B and C. This finding is consistent with the results of several other studies that have examined the impact of health education programs on knowledge improvement related to infectious diseases [17]. The post-test scores in our study were also positively correlated with the pre-test scores, suggesting that students with higher baseline knowledge levels benefited the most



Pre-intervention	Post-intervention
0.292	0.537
$p < 0.001$	$p < 0.001$

Fig. 1 Correlation between Knowledge and Attitude towards Hepatitis B and C

Table 5 Knowledge, attitude, and practices of study participants when stratified for different predictors ($N = 901$)

Variables		Knowledge	Attitude	Practice
Gender	Male	9.0 ± 3.3	6.8 ± 3.3	1.4 ± 1.0
	Female	8.8 ± 3.1	7.4 ± 3.1	1.4 ± 1.1
	p-value	0.291	0.010	0.919
Type of family	Nuclear	9.1 ± 3.1	7.2 ± 3.3	1.4 ± 1.0
	Joint	8.6 ± 3.3	6.9 ± 3.2	1.4 ± 1.0
	p-value	0.050	0.242	0.995
Religion	Hindu	8.9 ± 3.2	7.1 ± 3.2	1.4 ± 1.0
	Muslim	9.5 ± 3.3	7.2 ± 3.6	1.4 ± 1.0
	Sikh	8.5 ± 3.3	6.4 ± 2.8	1.2 ± 1.0
	Christian	8.0 ± 3.0	5.7 ± 3.9	2.0 ± 1.1
	Other	9.2 ± 2.8	7.9 ± 2.4	1.2 ± 0.9
	p-value	0.663	0.463	0.383

from the intervention. This pattern of results aligns with the other research conducted which found that the effectiveness of educational interventions is often influenced by the participants' initial knowledge levels [19]. A corresponding improvement was seen in the participants' attitudes following the awareness session in all parameters.

Attitude improvement

Our study also revealed a significant improvement in attitudes towards Hepatitis B and C after the informative session, with a 38.0% increase in attitude scores. This shows that not only did the educational program increase knowledge, but it also positively influenced the students' attitudes and perceptions regarding these diseases. A study conducted among the students of a central university in South Delhi (India) showed that, on average, 82% of participants showed a negative attitude toward HBV and HCV patients [20]. Only 18.4% of participants had no issues working with infected fellow students or caring for the infected family member. In this study, 33% of participants perceived ear/nose piercing or tattooing skin as one of the transmission routes of HBV and HCV. A literature review shows very contradictory evidence for the transmission route of HBV and HCV through piercing and tattooing [21]. Those already having associated risk factors along with body piercing and tattooing are prone to get infected with HBV and HCV.

In an international study by Nazri et al., this figure was 47.5% among Malaysian public university students on viral hepatitis [22]. In another international study by Ahmad et al., 70% of participants feared getting the disease and spreading it to family members if they encountered an infected person [23].

The linear regression analysis emphasized the effectiveness of the post-test session in enhancing knowledge, as it was 1.593 times more than the baseline value. These findings highlight the significance of educational programs in improving awareness and attitude toward Hepatitis B and C among school children. Similar findings have proved that health education can lead to more positive attitudes and reduced stigma associated with infectious diseases [19]. Previous studies have also claimed that with judicious screening and awareness campaigns, including safe sex practices, a significant reduction in the risk of acquiring hepatitis can be achieved [24, 25].

Conclusion

In conclusion, this study highlights the effectiveness of an educational intervention in improving the KAP related to Hepatitis B and C among school children in Delhi NCR. The substantial increase in knowledge and positive shift in attitudes following the intervention suggests

that targeted health education programs can play a crucial role in increasing awareness and understanding of infectious diseases. These findings align with similar studies conducted in other regions, further emphasizing the importance of health education in preventing and controlling the spread of Hepatitis B and C among school children.

Limitations

In our research, we assessed the immediate knowledge retention following the intervention. Nonetheless, it is crucial to conduct a follow-up study to determine the long-term sustainability of this knowledge. One limitation of our study is the selection of schools, which was performed using probability sampling from the same university without the schools' awareness or informing them of their likelihood of being chosen. This approach may introduce selection bias and limit the generalizability of our findings to a broader population. Additionally, the immediate post-intervention assessment does not account for potential changes in knowledge retention over time, which is essential for evaluating the intervention's long-term effectiveness. The absence of a control group (i.e., comparison group) hinders our ability to assess whether the observed changes from pre-test to post-test differ from a group that did not receive the training program. As a result, this design does not provide much assurance that any observed changes were attributable to the training program itself, as opposed to natural maturation and developmental processes or other confounding factors. In essence, this design fails to offer substantial evidence that the training was the cause of any observed changes between the pre-test and post-test.

Way Forward

Our current study demonstrates a significant correlation between students' attitudes and practices based on gender and family types, emphasizing the need for more comprehensive investigations into these factors. Such research could yield valuable insights and guide targeted interventions to address specific needs and enhance educational outcomes across various demographic groups. Conducting a cohort study to evaluate the retention of knowledge and attitudes among students over an extended period could offer valuable insights into their future behaviours and practices. The EMPATHY Campaign, which stands for Empowering People Against Hepatitis, is a unique initiative of the Institute of Liver and Biliary Sciences, New Delhi and is a large-scale public awareness initiative focusing on Hepatitis B and C at the national level and reducing the stigma associated with the condition. Additionally, the project aims to establish an environment that enables individuals with hepatitis and their families in India to participate in society and access care. The HEPiSCHOOL (Hepatitis Education Program in Schools) initiative under the EMPATHY campaign is a significant step in the continuum of the Hepatitis Awareness Mission, where every teacher and student becomes an ambassador for hepatitis awareness and pledges to eradicate Hepatitis by 2030.

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Author contributions

KK conceptualized, designed, developed the questionnaire, and conducted the study, prepared the manuscript draft and final manuscript, PA and ND contributed to data collection, data entry, writing and review, GK data analysis, KK overall manuscript review. All authors read and approved the final manuscript.

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Data availability

The data is available on request from the corresponding author. Relevant data generated or analysed during this study are included in this published article and its supplementary information files. The data is available on request from the corresponding author.

Declarations

Ethical approval

Ethics approval and consent to participate. Ethical permission was taken from ILBS's Institutional Ethics Committee via No. F.37/ (1)/9/ILBS/DOA/2020/20217/816 dated 22nd April 2022. Due assent and consent forms were taken from the participating students and their parents.

Consent for publication

Not applicable.

Conflicts of interest

The authors have no conflicts of interest to declare.

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