

# Empowering in-service nurses in management of viral hepatitis through Programmed Approach to Knowledge and Sensitization on Hepatitis (PRAKASH): An experience from a capacity building initiative

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## ABSTRACT

**Background:** Nursing fraternity are at an increased risk of acquiring hepatitis B and hepatitis C infections mainly attributable to occupational risk and close contact with the patients while treatment. However, unawareness and negligence about the severity, mode of transmission and preventive measures about the disease can further predispose the nursing fraternity to a higher risk of infection. To overcome these lacunae in knowledge, a training program named Project PRAKASH was initiated for in-service nurses across the country. The objective of the program was to impart up-to-date knowledge to the nursing professionals in the management of viral hepatitis and to assess the effectiveness of the training program through pre-post-knowledge assessment survey. **Methodology:** One-day training program titled 'Hepatitis Induction Program' was conducted for a period of 2 years (2018-2020) among nursing professionals. It was accompanied by administration of 54-item knowledge, attitude and practice (KAP) questionnaire with four sections: demographic details, knowledge (30 items), attitude (11 items) and practice (13 items), followed by post-knowledge assessment. An Impact Assessment Survey (IAS) was also administered to assess the change in attitude and practice among 10% of the attendees, at least 6 months post training. **Result:** A total of 32 one-day training programmes were organised which witnessed the training of 5,253 nursing professionals from 292 institutions across 12 states. A data of 4,474 participants were included in the final analysis: improvement in the knowledge score was significant ( $P$ -value < 0.001) with mean knowledge score of  $19.3 \pm 4.4$  in pre-test and  $25.7 \pm 3.9$  in the post-test. **Conclusion:** The one-day training resulted in improvement of knowledge and significant changes in the attitude and practices of the nursing professionals.

**Keywords:** Capacity building, health personnel, hepatitis, human, infection control, needle-stick injuries, nurses, viral, viral hepatitis vaccines

## Contribution of the Paper

### What is already known about the topic?

- Nurses and other healthcare professionals are at increased risk of acquiring hepatitis B and hepatitis C infections mainly

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attributable to occupational risk and close contact with patients while treatment.

- Despite high risk, there is unawareness and negligence about the severity, mode of transmission and prevention measures about the disease which can further predispose the nursing fraternity to a higher risk of infection.
- Thus, there is a need for training the healthcare professionals to minimise occupational risks among them.

### What this paper adds?

- One-day training programmes significantly improved the knowledge of the healthcare workers (HCWs) with respect to the prevention and management of viral hepatitis.
- The effect of the training program can be seen in significantly improving the attitude and practices of the nursing professionals after 6 months of the training.
- The effect of the training program is also reflected in better management and counselling of viral hepatitis patients by healthcare professionals.

### Abbreviations

- AIDS: Acquired Immunodeficiency Syndrome
- CNE: Certified Nurse Educator
- DNC: Delhi Nursing Council
- HBV: Hepatitis B virus
- HBsAg: Hepatitis B surface antigen
- HCV: Hepatitis C virus.

## Introduction

Viral hepatitis has been recognised as a global health challenge with approximately 1.4 million annual deaths, equivalent to the annual deaths caused by other communicable diseases particularly in low- and middle-income countries (LMICs).<sup>[1]</sup> India, with the second largest population in the world, is among the 11 countries which is carrying approximately 50% of the global burden of chronic hepatitis and is home to 40 million hepatitis B virus (HBV) and 10 million hepatitis C virus (HCV) individuals. With a prevalence of 4% in general population, India is positioned in intermediate to high endemicity zone for hepatitis B surface antigen (HBsAg). However, the prevalence of HBV is considered to be two to four times higher among healthcare workers (HCWs) mainly attributable to occupational risk.<sup>[2-4]</sup> The prevalence of hepatitis C is also reported to be higher among HCWs indicating the healthcare professionals to be among the most vulnerable groups for viral hepatitis.<sup>[5]</sup>

A study on HCWs emphasised that the professionals involved in patient care have increased exposure to percutaneous injury with blood, tissue or other body fluids that can potentially cause HBV and HCV.<sup>[6-8]</sup> In addition to this, LMICs like India have reported exceptionally higher incidence of needle-stick injury (NSI) ranging between 40 and 80%.<sup>[9]</sup> Occupational exposures are common in medical professionals but 40-75% of these injuries are not reported. Unreported NSI causes a

potential risk to HCWs as it inhibits them to avail post-exposure prophylaxis (PEP) services, which could have prevented HBV and HCV infections.<sup>[10]</sup> Studies have raised severe concerns regarding the unawareness of nursing fraternity, where only 40% of the HCWs were aware about the availability of PEP services in their hospitals. Moreover, high rates of ignorance and apathy can be assessed by the fact that only 25% of exposed the nursing students sought PEP after exposure to NSI.<sup>[11]</sup>

Despite the availability of safe and effective vaccine which offers more than 95% protection against HBV, less than 50% of the HCWs were found to be fully vaccinated, and among them, 30% had low anti-HBs titre levels.<sup>[12]</sup> Incomplete and unvaccinated respondents reported negligence as the most common reason for not getting vaccinated against HBV.<sup>[13]</sup> Thus, indicating negligence and unawareness about the severity of the disease can potentially predispose the HCWs to a higher risk of HBV and HCV. To overcome this lacunae in knowledge and educate HCWs, the Institute of Liver and Biliary Sciences (ILBS) initiated a project named 'Programmed Approach to Knowledge and Sensitization on Hepatitis' (Project PRAKASH) for in-service nurses across the country. The objective of the program was to impart up-to-date knowledge about management of viral hepatitis among nursing professionals and to assess the effectiveness of the one-day training program through pre-post-knowledge assessment survey. The study also aimed to explore the factors associated with knowledge gain in one-day training program on viral hepatitis and also to assess the impact of one-day training program on viral hepatitis on their attitude and practice at least after 6 months.


## Methodology

The one-day training program on viral hepatitis titled 'Hepatitis Induction Program' was conducted for a period of 2 years (January 2018 till January 2020) on a regular basis with an aim to impart up-to-date knowledge to nursing professionals in the management of viral hepatitis. The trainings were organised at ILBS, a super speciality institute involved in treatment and management of liver and biliary diseases. The training program was conducted in four phases which are described as here:

### Phase 1: Preparation of the training program

The first phase of the program included finalisation of scientific agenda and speakers [Figure 1], finalisation of study material which is to be circulated to the training participants, obtaining Certified Nurse Educator (CNE) accreditation from Delhi Nursing Council (DNC), liaising and engaging with various colleges, and preparation and validation of Knowledge, Attitude and Practice (KAP) and pre-post-test questionnaire.

The speakers were finalised on the basis of topic expertise after deliberation in various rounds of meeting discussions. The speakers were faculty members from the nursing college, subject experts from the departments like epidemiology, clinical virology and radiology. Interaction between project team and speakers

 <b>PROJECT PRAKASH</b> <b>PRogrammed Approach to Knowledge And Sensitization on Hepatitis</b> <b>HEPATITIS INDUCTION PROGRAM</b> Training of Nurses and Paramedical Staff on Viral Hepatitis				
SESSION	DETAILS	SPEAKER	DURATION	TIME
Opening	Participant Registration and Module Distribution	TEAM	60 MINS	8:00 AM - 9:00 AM
	KAP STUDY/PRE-TEST			
<b>TEA BREAK 09:00 AM - 09:15 AM</b>				
Introduction and Overview	Introduction to HIP & HUP	Akanksha Bansal	15 MINS	09:15 AM - 09:30 AM
	Overview & Epidemiology of Viral Hepatitis	Dr. Archana Ramalingam	45 MINS	09:30 AM - 10:15 AM
Lab diagnosis, clinical features and NSI in VH	Injection Safety & RDT - Live Demo	Mr. Gaurav Singh	20 MINS	10:15 AM - 10:35 AM
	Lab Diagnosis of Viral Hepatitis	Dr. Reshu Agarwal	40 MINS	10:35 AM - 11:15 AM
	Clinical features of Viral Hepatitis	Ms. Madhavi Verma	40 MINS	11:15 AM - 11:55 AM
	Needle Stick Injury and Injection Safety in context of Viral Hepatitis	Ms. Tarika Sharma	60 MINS	11:55 AM - 12:55 PM
<b>LUNCH BREAK 1:00 PM - 2:30 PM</b>				
Management of VH	Management of Viral Hepatitis	Dr. Sapna Chauhan	45 MINS	2:00 PM - 2:45 PM
Infection control	Disinfection & Sterilisation in context of Viral Hepatitis	Ms. Cicily Babu	45 MINS	2:45 PM - 3:30 PM
Other procedures	Fibroscan - Role in Hepatitis	Ms. Seena Babu	45 MINS	3:30 PM - 4:15 PM
Closing	1. Feedback About Training	TEAM	45 MINS	4:15 PM - 5:00 PM
	2. Post - Test			
	3. Valedictory and Certificate Distribution			

**Figure 1:** Agenda of the training of nurses on viral hepatitis under project PRAKASH

was conducted on finalising the objectives and topics of the sessions. These discussions were organised and presentations were updated on a regular basis as per the advancements related to viral hepatitis. The project team initially prepared the first draft of the module which was later revised by the post comments received from various experts including senior residents and faculty members from the Department of Hepatology. The final draft was validated by the experts and was later shared with the participants as reference material, post training. Based on the session objectives and important key points, a KAP and pre-test-post-test questionnaire was developed and was shared with session experts for content validation and necessary revisions were done as per the comments received by the experts.

CNE accreditation of Program PRAKASH was initiated from DNC following conduction of two trainings. The CNE accreditation holds importance amongst the nursing fraternity as it helps them in renewal of their registration after every 5 years. DNC provided a total of 8 credit hours. The brochure of the training course was circulated through various modes like emails and text messages with the principals, nursing officers, trainers, educators, nursing supervisors and faculties associated with the college of nursing for the registration of the participants. The training program provided online as well as offline provision for registration. A confirmatory email and text messages were sent to the participants which included information about the upcoming training program. Under Project PRAKASH, there was a provision of financial support for HCWs so as to reduce the burden on the HCWs and enhance the reach of the training program.

## Phase 2: Pre-knowledge assessment

Face-to-face trainings of nursing professionals were conducted at ILBS, New Delhi. An online link to KAP questionnaire

on viral hepatitis was administered to the participants via SurveyMonkey platform, before commencement of the training. The link was sent to them via text messages on their registered mobile numbers. The 54-item KAP questionnaire consisted of four sections: demographic details, knowledge (30 items), attitude (11 items) and practice (13 items); focusing on all aspects of prevention and management of viral hepatitis.

Section A consisted of demographic details which included variables like sex, age and years of experience practising as HCWs. Section B included 30 multiple choice questions assessing knowledge. Each question was of 1 mark, making the total score of the section to be 30. The knowledge section was further divided into four major domains: (i) transmission and risk factors; (ii) prevention; (iii) general and treatment related (iv) pathophysiology and disease progression. Section C had 11 questions related to the attitude of HCWs. The attitude questions were based on the 5-point-Likert scale for participants to choose from how much they agree or disagree with a particular statement. For positive questions, 'strongly agreed' was coded as 4; 'agreed' as 3; 'neutral' as 2, 'disagreed' as 1 and 'strongly disagreed' as 0. For negative questions, coding was the opposite of positive questions, 'strongly disagreed' as 4 to 'Strongly Agreed' as 0. The total score of the attitude questions ranged from 0 to 44. Section D consisted of 13 practice questions based on Yes, No and Don't Know, for participants to choose from three options in a statement. In a positive statement, Yes was coded as 2, No as 0 and Don't Know as 1, whereas in a negative statement, Yes was coded as 0, No as 2 and Don't Know as 1. The score of the practice question ranged from 0 to 26. The practice questions aimed to assess the participant's behaviour towards the patient and following of the best and safe infection control practices as per the universal precaution guidelines. The

project also provided information technology support to all the participants to resolve technical queries related to the filling of the questionnaires.

### Phase 3: Training program

The scientific training related to viral hepatitis continued for the entire day covering six important scientific topics with session duration ranging from 45 minutes to 2 hours each. The scientific sessions associated with the training program were divided into six major topics: (i) Overview, epidemiology and management of viral hepatitis; (ii) Laboratory diagnosis of viral hepatitis; (iii) NSI and infection prevention; (iv) Disinfection and sterilisation in context of viral hepatitis; (v) Role of fibroscan; and (vi) Counselling of viral hepatitis patients and their family members [Figure 1]. The information about these topics was enhanced through imparting an amalgam of theoretical knowledge as well as practical skills with respect to viral hepatitis. Detailed scientific sessions helped in obtaining updated information whereas demonstration of recapping, fibroscan and World Health Organisation (WHO) handwashing steps, motivating the HCWs to get themselves vaccinated and their family tested were practical concepts. Following the end of each session, the session experts addressed the queries of the participants. The content delivered through presentations was regularly updated as per the new advancements in viral hepatitis. All participants attending the full-day training program were provided 'Certificate of Participation' which was accredited with 8 credit hours by DNC.

### Phase 4: Post-Test: Scoring of questions and feedback of training

Following the end of the scientific sessions, the link of post-test questionnaire was circulated via text messages on their registered mobile numbers. The online post-test link was prepared using the SurveyMonkey platform and consisted of 30 questions related to knowledge about viral hepatitis as similar to pre-test (KAP). In addition to this, an online feedback form was collected from participants at the end of the session to assess the quality of the lectures. The feedback form consisted of five segments: (i) Relevance of the topics; was the content delivered balanced, objective and evidence based. (ii) Has the participant gained confidence in implementing the learning in their own setting? (iii) Has the participant learnt anything new unknown earlier. (iv) Were they satisfied with the arrangements? (v) Any suggestions to make. For these, a rating scale of 1-5 was used where poor was coded as 1, average as 2, good as 3, very good as 4 and excellent as 5. The feedback form also consisted of Yes-No questions as well as an open-ended comment section.

### Phase 5: Impact assessment

In addition to the pre-post, an Impact Assessment Survey (IAS) was undertaken in a sub-population of the participants. The IAS questionnaire was sent to only those participants who had completed at least 6 months post-training period. The questionnaire aimed to analyse the changes adopted by HCWs

in their daily routine and clinical practice with respect to viral hepatitis after attending the training program. The survey questionnaire intended to assess the improvement in the following of universal precautions by HCWs and improvement in counselling of patients and relatives regarding viral hepatitis screening and vaccination. A total of 10% response was expected to be collected through IAS.

### Ethical approval and informed consent

The present activity was undertaken as a part of outreach activity; however, permission from the institute was taken under No. F.37 (1)/9/ILBS/DOA/2020/20217/78. Informed consent of the participants was obtained at the time of data collection as the first page of the survey included a brief paragraph about the informed consent. Furthermore, the participants had the right to withdraw from the study at any stage. The identification details were made anonymous by providing unique identity numbers to the participants and the results were kept confidential and were not shared with anyone apart from the research team.

## Result

A total of 32 one-day training programmes on viral hepatitis were organised for nursing professionals at ILBS from January 6, 2018 to January 30, 2020. A total of 5,253 nursing professionals from 292 institutions across 12 states of India have attended the training program. Overall, about 70% of the registered participants attended the trainings with an average participation of 164 in each session. The training duration ranged from 8 to 9 hours. The program was conducted for 2 years with the response being the maximum in the year 2019. The activities were initiated in 2018 with a response rate of 23.29% ( $n=1146$ ) whereas the response rate in the consecutive year increased to 72.24% ( $n=3554$ ). Only 220 participants (4.47%) could be trained in 2020 as the trainings were adjourned due to the COVID-19 pandemic.

**Table 1: General Characteristics of the Participants (n=4920)**

Demographic Characteristics	n%
Mean Age (SD)	33.71 (8.36)
Gender	
Female	3593 (73.06)
Male	1325 (26.94)
Year	
2018	1146 (23.29)
2019	3554 (72.24)
2020	220 (4.47)
Type of Facility	
Government	4348 (88.4)
Private	572 (11.6)
Location	
Delhi	4696 (95.4)
Outside Delhi	224 (4.6)
Median years of experience (IQR)	8 (3-13)

SD : Standard deviation; IQR: Interquartile range

Table 2: Pre-post Knowledge Questionwise (n=4474)

Knowledge-related Questions	Pre-score	Post-score	Knowledge improvement (%)
What is hepatitis?	4358 (97.4)	4449 (99.4)	2.09
Hepatitis A is transmitted through?	2185 (48.8)	3237 (72.4)	48.15
What are the types of viral hepatitis?	3446 (77)	4366 (97.6)	26.70
Acute liver failure, especially in pregnant women, is caused in which hepatitis virus?	1237 (27.6)	3712 (83)	200.08
Following pose increased risk for hepatitis A and E	3872 (86.5)	4302 (96.2)	11.11
Following are true about hepatitis A and E EXCEPT	1990 (44.5)	3572 (79.8)	79.50
Hepatitis B is NOT transmitted by	4130 (92.3)	4394 (98.2)	6.39
Chronic viral hepatitis is a hepatitis that lasts more than	2397 (53.6)	4271 (95.5)	78.18
Infection at what age can lead to a maximum chance of chronicity for hepatitis B?	771 (17.2)	3449 (77.1)	347.34
Who is NOT at risk for hepatitis B	3692 (82.5)	4308 (96.3)	16.68
To clean blood spills from an HBV-infected person, what should be used?	2948 (65.9)	4052 (90.6)	37.45
A HBV-infected person can	4174 (93.3)	4325 (96.7)	3.62
Following are TRUE for HBV infection treatment	2309 (51.6)	3296 (73.7)	42.75
Following are true about HBV vaccine EXCEPT	3339 (74.6)	3838 (85.8)	14.94
Following strategies can be used for preventing HBV infection EXCEPT	2871 (64.2)	3906 (87.3)	36.05
A child born to an HBV-infected mother should receive	2304 (51.5)	3245 (72.5)	40.84
All of the following are TRUE about hepatitis C EXCEPT	1159 (25.9)	2642 (59.1)	127.96
The following can be caused as a sequelae of HCV infection	2729 (61)	3891 (87)	42.58
HCV is transmitted by all EXCEPT	3585 (80.1)	4227 (94.5)	17.91
Following people are at risk for HCV infection	3987 (89.1)	4322 (96.6)	8.40
Following are true about HCV infection EXCEPT	1772 (39.6)	3043 (68)	71.73
Following is NOT true about HCV treatment	2087 (46.6)	3663 (81.9)	75.52
Following statement is TRUE about HCV infection	2819 (63)	3288 (73.5)	16.64
Following are the personal protective equipment EXCEPT	4120 (92.1)	4341 (97)	5.36
Needle-stick injury can cause the following infection	4056 (90.7)	4348 (97.2)	7.20
The following needs to be done after a needle-stick injury EXCEPT	3409 (76.2)	4008 (89.6)	17.57
The following type of hepatitis is food and water borne	3802 (85)	4355 (97.3)	14.54
The following statements are true EXCEPT	1657 (37)	3276 (73.2)	97.71
All of the following can be transmitted through infected blood EXCEPT	1730 (38.7)	2593 (58)	49.88
The route of administration of hepatitis B vaccine is	3600 (80.5)	4201 (93.9)	16.69

A total of 5,253 HCWs were trained, however, 4,920 responses were received through the online survey conducted via SurveyMonkey before commencement of the training program. The mean age of the participants was  $33.71 \pm 8.36$  years. The proportion of the female participants (73.1%) who attended the training was higher than the male participants (26.9%). Approximately 95.4% of the total participants were working in institutions based in Delhi and approximately 88.4% were working in a government health facility. The median experience of the participants was found to be 8 years (Inter Quartile Range [IQR] :3-13) [Table 1].

### Pre-and post-knowledge assessment

A total of 4,474 participants were considered for the analysis of pre-post knowledge assessment score as approximately 779 responses were excluded from the final analysis due to incomplete, missing or duplicate responses from the participants. The overall response rate in post-test was 85.1% as few participants did not fill the post-test since it was voluntary. The typical time spent to fill the pre-test and post-test ranged from 12 to 15 minutes for each test. The pre-post analysis of knowledge questions indicated improvement in the knowledge of the participants following the training program. The mean improvement in the knowledge

score was found to be significantly associated ( $P$ -value  $< 0.001$ ) with mean knowledge as  $19.3 \pm 4.4$  in pre-test and  $25.7 \pm 3.9$  in post-test out of 30. The percentage improvement in the knowledge of the participants in each question ranged from 2.1 to 347.3% [Table 2].

### Feedback

A total of 4,106 (91.8%) participants have filled the feedback form post training. The overall mean score of the training feedback was found to be  $4.16 \pm 0.60$  out of 5. The feedback related to relevance and objective-based learning was found to be the highest among the two topics: NSI and infection safety ( $4.38 \pm 0.77$ ) and role of fibroscan in viral hepatitis ( $4.20 \pm 0.84$ ). In addition to this, 3,747 participants (91.25%) felt that they can practice the learnings of the training program in their own setting. The feedback related to questions assessing the value addition to the existing knowledge indicated upgradation of new learnings in 3,325 (80.97%) participants. The mean score for the training arrangements was found to be  $4.35 \pm 0.81$  [Table 3].

### Impact assessment

A total of 12% responses ( $n = 623$ ) were received from the participants who have completed at least 6 months

post-training period. Out of which, 534 responses were included in the analysis ( $n = 534$ ) after removing the duplicate and incomplete entries. The IAS assessment indicated that 82.0% of the participants ( $n = 438$ ) initiated the use of personal protective equipment's (PPEs) on a regular basis, post attending training. It was found that 97.9% ( $n = 523$ ) of the participants were following the injection safety protocols on a regular basis, post training. In addition, 79.8% ( $n = 426$ ) participants have started advising HBV and HCV patients and their family members about the screening of viral hepatitis on a regular basis. Approximately, 83% ( $n = 443$ ) participants started advising high-risk patients and relatives about HBV vaccination [Table 4].

## Discussion

The negligence and unawareness about the overall impact of viral hepatitis can potentially predispose the HCWs to a higher risk of HBV and HCV infections. This lacunae in knowledge and attitudes can be overcome by providing adequate and updated training to the HCWs. With this purpose, ILBS initiated Project PRAKASH for in-service nurses across the country. This was a first of its kind initiative which aims at training nurses, doctors and other paramedical staff in viral hepatitis across India. The methodology and effectiveness of the meticulously planned training program is important to be discussed for its replication at various places across the country. Thus, this article provides the methodology and effectiveness of one-day training program on viral hepatitis.

Project PRAKASH trained and updated the knowledge of about 5,253 nursing professionals from 292 institutions across 12 states

with 32-one-day trainings over 2 years. The project was able to educate the participants with a mean age  $33.71 \pm 8.36$  years and female to male ratio being 2.8, which is slightly higher than the existing female to male ratio (1.6) as per WHO.<sup>[14]</sup>

The combination of theoretical as well as practical concepts helped the in-service nurses to enhance their knowledge on viral hepatitis. The well-designed scientific module along with the reading materials helped the participants to self-directed learning. Furthermore, the discussion and resolution of the queries at the end of each session helped in understanding the concepts better. With these advantages of one-day training sessions, viral hepatitis was able to statistically improve the mean knowledge score from  $19.3 \pm 4.4$  in pre-test to  $25.7 \pm 3.9$  in the post-test. A similar kind of improvement followed by extensive training was reported from previous studies on Indian HCWs.<sup>[15-18]</sup>

The percentage of improvement in the knowledge of the participants varied across the 30 questions ranging from 2.1 to 347.3%. It was found that the percentage improvement was less in questions which were fact based and simple whereas improvement was found to be more in questions were understanding and practical concepts needed to be applied. Furthermore, the margin of improvement was limited in case of easier and fact-based questions as most of the participants provided the correct response in the pre-test itself. However, to the contrary, the difficult or concept-based questions were less likely to be answered correctly by the participants in pre-test and had a great range of improvement among participants following the training.

Though, it was difficult to assess the change in attitude and practice through one-day training, the project team considered a change in attitude and practice with assessment of nursing practice with respect to viral hepatitis at least after 6 months of the training. The drastic change in various domains can be witnessed, such as 91.8% study participants started following universal precautions with 82% of them using the PPEs always, 97.9% were following the infection safety protocol on a regular basis and 90.1% became vigilant towards NSI. Furthermore, 83% of the participants who were not vaccinated against hepatitis B virus (HBV) got themselves vaccinated and approximately 89.9% got their titre tested. The impact can be observed in clinical practices as well as 79.8% started counselling the family of the hepatitis B and hepatitis C positive individuals to get themselves screened and vaccinated. Thus, these changes in clinical as well

**Table 3: Feedback received from the participants (n=4106)**

Domains	Mean±SD
Overview and epidemiology of viral hepatitis	4.09±0.82
Clinical features and diagnosis of viral hepatitis	4.03±0.85
Management of viral hepatitis and its complications	4.04±0.85
NSI and injection safety	4.38±0.77
Disinfection and sterilisation in context of viral hepatitis	4.08±0.90
Lab diagnosis of viral hepatitis	4.07±0.86
Fibroscan	4.20±0.84
Please share your feedback about the arrangements	4.35±0.81
Overall	4.16±0.60

SD: Standard deviation

**Table 4: Impact Assessment Survey (n=534)**

Impact Assessment Survey Questions	Never n (%)	Sometimes n (%)	Always n (%)
Started following universal precautions	3 (0.56)	41 (7.68)	490 (91.76)
Started using personal protective equipment's (PPE)	3 (0.56)	93 (17.42)	438 (82.02)
Started following injection safety protocols	1 (0.19)	10 (1.87)	523 (97.94)
Started reporting needle-stick injuries (NSI)	7 (1.31)	43 (8.05)	484 (90.64)
Started advising high-risk patients and relatives about hepatitis B and C testing	6 (1.12)	102 (19.10)	426 (79.78)
Started advising high-risk patients and relatives about hepatitis B vaccination	13 (2.43)	78 (14.61)	443 (82.96)
Started advising pregnant females for HbsAg testing	11 (2.06)	43 (8.05)	480 (89.89)

as personal protection with respect to positive attitude and good practices can be considered as an impact on the education and training of the HCWs.

However, the study was not able to collect post-test responses from approximately 15% of the participants and also it cannot be assessed whether these 15% purposefully did not fill the post-test because of expecting low score or it was unintentional. The study could have also suffered a response-shift bias because of its pre-post design. There could have been selection bias in IAS as the participants who filled the survey were based on voluntary participation. Thus, the attitude and practice shift might not be representative of all nursing professionals in the country.

Despite these inherent limitations, to the best of our knowledge, this is one of the biggest and pioneer model involved in training of in-service nurses across India. Moreover, the study was able to provide and follow a sub-sample of nurses to assess the impact of one-day training on the clinical practices and personal protection. Overall, the improvement of knowledge and significant changes in attitude and practices of the nursing professionals can be attributable to one-day training program imparted under Project PRAKASH. However, more studies are required to study the factors associated with learning and training in the future. Overall, it was a unique and successful model which could be replicated in strengthening and empowering the HCWs on various health-related topics.

As mentioned in the Alma-Ata Declaration,<sup>[19]</sup> health education on existing health issues is one of the key elements of primary healthcare, also accessibility to quality healthcare is cited to be an important principle of primary healthcare practice.<sup>[20]</sup> Our study highlights both the methodology and impact of healthcare training programmes, which in turn results in knowledge enhancement of nursing professionals, and hence, better disease management.

### Summary of key points

Knowledge interventions, like one-day training program, can significantly affect the immediate knowledge level as well as provide long-term benefit of behavioural modification in the management of viral hepatitis patients by nursing professionals.

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### Conflicts of interest

No potential conflict of interest is encountered by the authors. The views and opinions expressed in this article are the work of the authors and do not necessarily reflect an official position of the Institute of Liver and Biliary Sciences on capacity building.

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