

## Association of Hepatitis B Knowledge and Awareness among Community Dwelling Healthy Adult Populations of Tamil Nadu, India: A Community-Based Cross-Sectional Study

**Dhasarathi Kumar**

*Corresponding Author, Research Scholar,  
School of Public Health,  
SRM Institute of Science and Technology,  
Chengalpet, Tamil Nadu*

**B. Kalpana Kosalram**

*Associate Professor,  
Division of Health Policy and Management,  
School of Public Health,  
SRM Institute of Science and Technology,  
Chengalpet, Tamil Nadu*

### Abstract

**Background:** Hepatitis B Viral (HBV) infection is a major public health concern in India. However, people have limited knowledge and awareness regarding the hepatitis B viral infection. Knowledge and awareness related information are an essential component for designing effective interventions and strategies for disease prevention and control. This study aims to assess the knowledge and awareness regarding Hepatitis B Viral (HBV) infection among community-dwelling healthy adults of Tamil Nadu, India.

**Materials and Methods:** A community-based descriptive cross-sectional study was conducted between September 2019 and February 2020 in the Tamil Nadu state of India. A simple random sampling strategy was used to attain the samples from each household, one adult has been selected based on the inclusion criteria, and face to face interview was conducted by using a semi-structured, pretested tool.

**Result:** A total of 426 households were contacted to attain the ideal samples. At last 320 samples were included for the final analysis. About 63 percent of the study subjects were male and 37 percent of them were female. Almost 82 percent of them were obtained a degree (41 percent of them were undergraduate and 41 percent of them belonged to postgraduate). About 71 of them were stated that HBV caused by a virus. Good knowledge of HBV was associated with good awareness. In the chi-square analysis, the study found a significant association between adult age group, being a family man/women (married), and high family income was associated with good knowledge.

**Conclusion:** Current study reveals a level of knowledge and awareness of hepatitis B viral infection (HBV) among adults in Tamil Nadu, India. Study finding reveals that there is a need to improve public disease-specific knowledge and awareness for the prevention of hepatitis B viral infection. Well-designed community programs and health education mainly focusing on the vulnerable groups will help it improve the knowledge and awareness of hepatitis B viral infection.

**Keywords:** Hepatitis B Viral Infection, Awareness, Knowledge, Community, and Cross-Sectional Study

### 1. Introduction

Globally infectious diseases remain a leading cause of morbidity and mortality [1, 2]. According to world health organization WHO estimates worldwide (2015), 257 million people are chronically infected with hepatitis B viral infection (HBV), nearly 27 million of the world population are living with hepatitis B virus infection (HBV) and about 4.5 million individuals are diagnosed and they are on the treatment, every year about 887000 people die due to the complications of acute or chronic hepatitis B infection mainly due to cirrhosis of liver, and liver cancer [3]. Worldwide hepatitis B virus infection is an important public health concern [4]. Current Global Burden of Disease(CBD) result shows chronic HBV contribute to increased morbidity and mortality, in spite of reductions over the past 10 years [5, 6]. Literature revealed that the highest prevalence of Hepatitis B surface antigen (HBsAg) was found to be 3.61% among African region, followed by Southeast Asian region (2%) [4, 7, 8]. In India, it is found that approximately 4 crore individuals are affected by Hepatitis B Viral infection (HBV) and nearly 0.6-1.2 crore individuals are affected by Hepatitis C Virus (HCV).HBV remains to be a significant public health problem in India[9, 10]. On the occasion of the World Hepatitis Day, 28th July 2018, by the Government of India, Ministry of Health and Family Welfare (MoFH) has launched the National Viral Hepatitis Control Program(NVHCP) [11]. NVHCP is comprehensive programme for the prevention and control of viral hepatitis in India to achieve Sustainable Development Goal (SDG) 3.3 which aims to ending viral hepatitis by 2030 [12].

In 2015, the World Health Organization issued the Glasgow Declaration on Hepatitis Elimination. The declaration outlines the commitments necessary to eliminate viral hepatitis as a public health concern by 2030 [6]. To accomplish this target, the Ministry of Family and Health other multi-sector organizations are working together to develop a strategic road map for eliminating the viral hepatitis in India by 2030 [3, 11].

### **Rationale**

Hepatitis B Viral (HBV) infection is a major public health concern in India. Road map to decrease the burden of hepatitis B viral infection is using the preventive measures such as vaccination, routine checkup, and other interventions are vital. These preventive measures should not only be conducted by the government it should also include participations from the community members. Hence, community people disease-specific knowledge becomes an essential component for designing an effective intervention strategies for the prevention and control of HBV. The paucity of existing scientific literature indicates that there is a need for more wide-ranging data regarding the knowledge and awareness of hepatitis B viral infection among the Indian population.

### **Aim and Objectives of the Study**

Current study aims to assess the knowledge and awareness of hepatitis B virus among the adults resides in Tamil Nadu. Findings from current study could be used to design the preventive measures and developing new strategies at country level and to develop a comprehensive hepatitis B preventive program.

## **2. Materials & Methods**

### **Study Design**

Community based descriptive cross sectional study was conducted to assess the knowledge and awareness among the healthy adults in Tamil Nadu.

### **Study Setting**

Between April and September 2019, community based descriptive cross-sectional study was conducted among the adults in study area was selected from northern districts of Tamil Nadu (Chengalpattu, Kancheepuram region). Current study setting, study design, analysis was followed the STROBE guideline [13].

### **Sample Size Calculation**

A study conducted among general population of Gujarat founds the participants knowledge score on the prevention of HBV was 23 percent [14]. With the 72 percent 95 CI (Confidence Interval) and 5 % Margin of error 272 is calculated as appropriate sample size at last 320 samples were obtained.

$$n = \frac{z^2 pq}{e^2}$$

$$p = 0.23$$

$$q = 0.77$$

$$z = 1.96$$

$$e = 0.05$$

### **Study Tool Preparation and Testing**

Extensive literature review was done to develop the study tool. Based on extensive literature review a set of variable has been selected. Semi structured questionnaires was developed and translated to the Tamil language for local relevancy. The semi structured questionnaire was divided into three sections, section A is about the general information/demographic profile, section B covered knowledge and section C is about awareness of Hepatitis B. The knowledge section of the questionnaire include Hepatitis B disease details such as etiology, signs and symptoms, disease transmission, preventive strategy and treatment. Section C covered the awareness on Hepatitis B disease status and Hepatitis B vaccination status. Total of 26 items were used to measure knowledge and awareness of Hepatitis B, among this 22 items were belong to knowledge section and 4 items were belong to awareness. Before administrating the questionnaire pilot testing was done among the 32 adults. Face validity and content validity was done to check the validity of the tool. Data were captured by using the pretested semi-structured Questionnaire. Descriptive data analysis was done and chi-square was done to find out the association between the other variables.

### **Scoring**

Knowledge towards HBV was assessed by a 22 questions and score of 1 was given to correct answer and 0 to the wrong answer, with this the score range of maximum of 22 to a minimum of 0. Awareness towards HBV was assessed by asking four questions as shown in Table 3. Each correct answer were given score of one and wrong answers were given 0, with this the scale measured awareness from maximum 4 to minimum 0. Higher the score

indicates the higher the level of knowledge and the awareness.

### Inclusion Criteria

Individuals aged 18 years and above, individuals who are the permanent residents in the study area atleast for a minimum of one year. This current study has been conducted among the household, which is located nearby Irula tribal settlement. One study subject from each household was selected randomly.

### Exclusion Criteria

Who were not willing to participate were excluded from the study.

### Ethics Approval and Consent to Participate

The protocol was presented to an ethical review committee at Faculty of SRM School of Public Health, SRM University, and Tamil Nadu. Before participate in our study, brief explanation was given about the study aims, objectives, risk, benefits of our current study. We informed to the study subject regarding the withdrawal. Prior to enrollment we received oral and digital informed consent from the study participants.

### Data Collection

House to household survey was conducted. Simple random sampling strategy was used to obtain the sample unit of adults from the study setting. One adult from each household has been selected. Of an average 8-10 samples were collected per day by the researcher.

### 3. Results

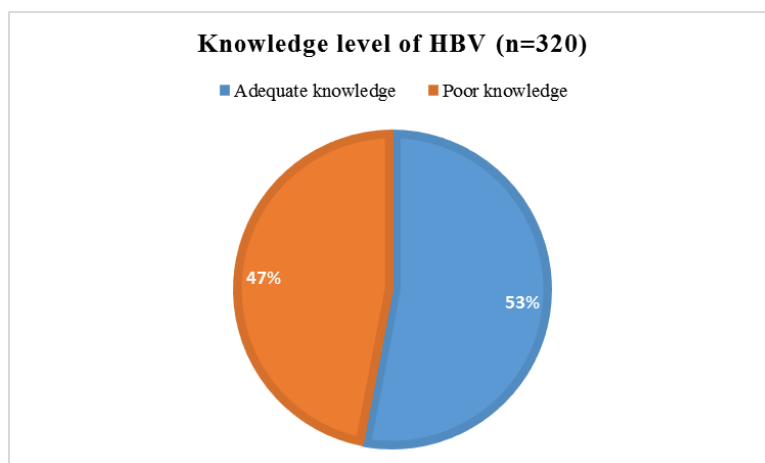
A total of 346 households were contacted to attain the ideal samples. At last 320 samples were included for the final analysis.

**Table 1: Socio Demographic Characteristics of the Study Participants (n=320)**

Variables		Frequency	Percent
Mean age of the participants		30.49	
Gender	Male	200	62.5
	Female	120	37.5
Region	Rural	170	53.1
	Urban	150	46.9
Marital status	Unmarried	124	38.8
	Married	196	61.3
Occupation	Unemployment	26	8.1
	Student	20	6.3
	Self-Employment	30	9.4
	Private Sector	200	62.5
	Public Sector	34	10.6
	Other	10	3.1
Educational attainment	Secondary Schooling	16	5.0
	Diploma/Certificate	38	11.9
	Undergraduate	134	41.9
	Postgraduate	132	41.3
Family income (Mean)		408918.75	

Data Source: Primary Data

Table 1 shows mean age of the study participants was found to be 30.49. About 63 percent of the study subjects were male and 37 percent of them were female. More than half of the study population are belong to rural area (53%), 47 per cent of the participants are belong to an urban setting, majority of them were unmarried (61%). About 63 percent of the study participants are working in private sector, followed by public sector and 8 percent of them were unemployed. Almost 82 percent of them were obtained a degree (41 percent of them were undergraduate and 41 percent of them belonged to postgraduate). Mean value of the family income was found to be 408918.75 Indian rupee.



Data Source: Primary Data

**Figure 1: Knowledge Level of HBV (n=320)**

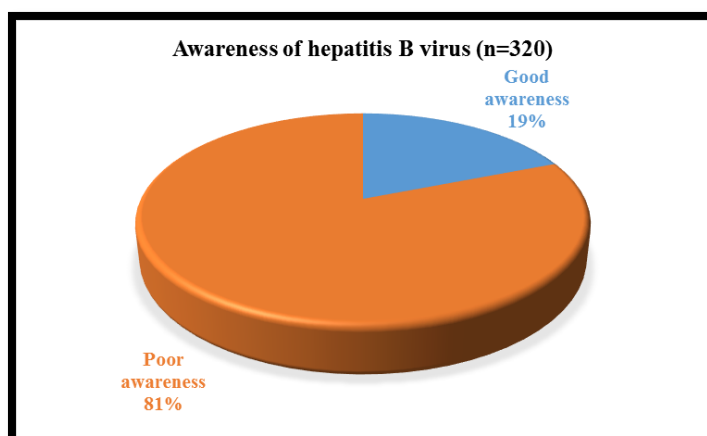
Figure 1 shows that more than half of the study participants are had good knowledge towards hepatitis B virus and 47 percent of the study participants were not have knowledge on hepatitis B. Knowledge towards HBV was assessed by a 22 questions and score of 1 was given to correct answer and 0 to the wrong answer, with this the score range of maximum of 22 to a minimum of 0. Scores < 18 were taken as poor knowledge and,  $\geq 18$  as good knowledge of hepatitis B. The mean score of knowledge on hepatitis B was found to be 18.15 ( $\pm 3.70$ ), and minimum 4, maximum 22.

**Table 2: Awareness of Hepatitis B Virus among the Study Participants (n=320)**

Variables	Options	Frequency	Percent
Government provides free Hepatitis B vaccination for infants in India	Yes	278	86.9
	No	42	13.1
I know the status of my family members Hepatitis B	Yes	82	25.6
	No	218	74.4
I know my status Hepatitis B	Yes	111	34.7
	No	209	65.3
I have completed Hepatitis B vaccination	Yes	142	44.4
	No	178	55.6

Data Source: Primary Data

Above table 2 shows that majority of the respondent 87 percent of the study participants are aware about the free hepatitis B vaccine for infant in India, about 74 percent of them are not aware of the hepatitis B status of their family members. Nearly 35 percent of the participants are aware of their hepatitis B status. About 44 percent of the participants are completed hepatitis B vaccination.



Data Source: Primary Data

**Figure 2: Awareness of Hepatitis B Virus (n=320)**

Figure 2 shows that only 19 percent of the study participants are had good awareness towards hepatitis B virus and majority of the study participants were not aware of hepatitis B. Awareness towards HBV was assessed by asking four questions as shown in Table 3. Each correct answer were given score of 1 and wrong answers were given 0, with this the scale measured awareness from minimum 0 to maximum 4. The mean score of awareness on hepatitis B was found to be 1.9 ( $\pm 1.28$ ), and Scores  $< 3$  were taken as poor awareness and,  $\geq 3$  as adequate awareness of hepatitis B.

**Table 3: Association of Socio-Demographic Factors and Knowledge Level of Hepatitis B among Adults**

Variables	OR	P Value	95% CI
Age (more than 30 years)	3.1	0.000 *	(1.91- 5.00)
Gender (Male)	1.5	0.073	(0.96-2.38)
Region (Urban)	0.8	0.408	(0.53-1.29)
Marital status (Married)	1.9	0.006*	(1.19-2.96)
Occupation	1.3	0.300	(0.74-2.60)
Educational attainment	1	0.837	(0.59-1.91)
Annual Income	2.3	0.000*	(1.47-3.61)
Awareness Score	2.5	0.002*	(1.40-4.66)

Data Source: Primary Data

In the chi-square analysis, study found a significant association between adult age group, being family man/women (married), and high family incomes were associated with good knowledge. Out of the total participants, 170 (53 %) had a good knowledge level (figure 1). Compared to the youngest age group (18-30 years), participants who is aged 30 and above had 3.1 times higher odds of having good knowledge (OR: 3.1; 95% CI: 1.91–5.00). Being a family men /women was associated with good knowledge (OR: 1.9; 95% CI: 1.19-2.96) compared to unmarried. A higher annual income was also associated with good knowledge (OR: 2.3; 95% CI: 1.47-3.61). Good knowledge was associated with good awareness (OR: 2.5; 95% CI: 1.40-4.66).

**Table 4: Association of Socio-Demographic Factors and Awareness Level of Hepatitis B among Adults**

Variables	OR	P value	95% CI
Age (more than 30 years)	1.2	0.422	(0.71- 2.21)
Gender (Male)	1.1	0.073	(0.62-1.98)
Region (Urban)	1.2	0.405	(0.72-2.20)
Marital status (Married)	1.7	0.080	(0.93-3.11)
Occupation	2.8	0.047*	(0.97-8.21)
Educational attainment	1	0.861	(0.50-2.26)
Family annual income	1.7	0.049*	(0.99-3.06)

Data Source: Primary Data

Chi-square was performed to find the statistical significant difference between awareness level and across age, region, employment status, educational attainment, and family income (Table 4). Out of the total participants, 61 (19%) had a good awareness level. In the chi-square analysis, occupation and family annual income were associated with good awareness. Age, gender, region, marital status, and education had no association with participant's awareness (Table 4). Compared to individuals who are unemployed and students, an increased OR was observed among participants who are working/ employed (OR: 2.8; CI: 0.97-8.21). A higher annual income was also associated with higher level of awareness.

#### 4. Discussion

Hepatitis B and C contributed to the significant share of morbidity and mortality in worldwide and in India as well [10]. So the government of India through the Ministry of Family and Health (MoFH) has initiated the national level program to reduce the burden of viral hepatitis infection among the Indian population. Reducing the occurrence HBV by both of vertical and horizontal transmission is an essential component in preventive measures. These preventive strategies can only succeed if the community members have knowledge and awareness regarding HBV. Therefore, knowledge and awareness is an important concept for understanding the people's knowledge and awareness at community level and also it will help us to design the preventive strategies.

Current study found that 53 percent of the study participants had good knowledge of hepatitis B but only 19 percent of the study participants had good awareness towards HBV. Our study results are comparable earlier published studies in India. A study conducted by Nalli SK et al. among the nursing students found that the students had good knowledge regarding HBV and on further they stated that compared to first year students,

second, third and fourth year students had good knowledge regarding the causative agent and its incubation period [17].

Present study finding on vaccination are comparable with previous study conducted by Rath, et al in newly established medical Institution under the Government of National Capital Region of Delhi states that in only 13 (8%) students had received a completed course of hepatitis B vaccination in the past, which is in agreement with our study as well, 44 percent of the samples were immunized against hepatitis B [18].

The present research has shown that there is positive association between knowledge and awareness. A study conducted by ul-Haq N et al among 780 samples in Quetta, Pakistan states that there is positive linear correlations between attitude-practice ( $r = 0.331, p < 0.01$ ) knowledge vs attitude ( $r = 0.296, p < 0.01$ ), and knowledge vs practice ( $r = 0.324, p < 0.01$ ) [19].

A knowledge, attitude, practice (KAP) of HBV among healthy female worker was conducted by Tariq wani R et al. from Kashmir, India reported that age was associated with the mean score of KAP and there is significant correlation between knowledge-practice, knowledge-attitude [20]. Which is in agreement with the current study age is associated with knowledge score of the study respondents. Another study from Gujarat states that majority (92%) of the study participants had adequate level of knowledge on symptoms, which is very close to the present study findings, our study found more than half of the participants were had good knowledge (53%) on HBV and occupation were associated with good awareness and Studies have shown similar results which is conducted among the 758 Malaysian households [14, 21].

### Conclusions

Even though hepatitis B is significant public health issues and which resulted in higher number of death globally, knowledge and awareness regarding hepatitis B viral infection among households in Tamil Nadu appears low. Hence, there is a need for well-designed preventive strategy and programs. These programs have been too comprehensive, and it aimed to increase the knowledge, improve the preventive practices, and also improve the vaccine coverage among households. Vaccine coverage is an important preventive strategy because hepatitis B is vaccine preventable disease, so designed program should be focus on most vulnerable populations and high risk groups, people with low knowledge, awareness on hepatitis B infection [22]. We also recommend that educational materials should be prepared and which is aimed to seek elimination of HBV, social stigma, and acceptance of vaccine, Behavioral Change Communication (BCC). By successful implementation of diagnostic, treatment, and preventive programs at every level of healthcare delivery system, we will eliminate the HBV by 2030.

### Strengths and Limitations of this Study

Simple random technique was used to obtain the study sample, which is an important strength of the current study and therefore we have confidence to generalize the result to northern districts of Tamil Nadu population. This study propose some insights, quality assurance, guidance, and programs regarding hepatitis infection in Tamil Nadu, India among the tribal, rural, and the urban populations.

Our limitation of the study include, there may be a potential risk of social desirability bias because participants might tend to give favorable answers during the interview. However, we cannot generalize the result to the entire Indian population, because India is a diverse country and every states in India has their own custom, taboos, culture, and they are unique in their way.

### Abbreviations

HBV: Hepatitis B Virus; KAP: Knowledge, Attitude, Practice; HBsAg: Hepatitis B virus surface antigen; HCV: Hepatitis C Virus; CBD: Global Burden of Disease; SDG: Sustainable Development Goal; MoFH: Ministry of Health and Family Welfare; NVHCP: National Viral Hepatitis Control Program; 95% CI: 95% Confidence Intervals; OR: Odds Ratio; BCC: Behavioral Change Communication;

**Funding:** None

**Conflict of Interest:** None

### REFERENCES

1. Hinman AR. Global progress in infectious disease control. *Vaccine*. 1998 Jul 1; 16(11-12):1116-21.
2. Cohen ML. Changing patterns of infectious disease. *Nature*. 2000 Aug; 406(6797):762-7.
3. WHO: Hepatitis B. Available from: <http://www.who.int/mediacentre/factsheets/fs204/en/> [Accessed: 23 April 2020].
4. Bakarey AS, Ifeora IM, Adewumi MO, Akere A, Omoruyi CE, Ogunwale AO, Olaleye VF, Awokunle RF, Sekoni DE, Adeniji JA. Hepatitis B Virus Serological Markers in a Rural Community in Southeastern Nigeria. *Journal of Advances in Medicine and Medical Research*. 2017 Apr 27:1-9.

5. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015; 385: 117–71.
6. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015, published online June 7. [http://dx.doi.org/10.1016/S0140-6736\(15\)60692-4](http://dx.doi.org/10.1016/S0140-6736(15)60692-4).
7. Kowdley KV, Wang CC, Welch S, Roberts H, Brosgart CL. Prevalence of chronic hepatitis B among foreign-born persons living in the United States by country of origin. *Hepatology*. 2012 Aug; 56(2):422-33.
8. MacLachlan JH, Cowie BC. Hepatitis B virus epidemiology. *Cold Spring Harbor perspectives in medicine*. 2015 May 1; 5(5):a021410.
9. Parija PP. Hepatitis B vaccine birth dose in India: time to reconsider. *Human Vaccines & Immunotherapeutic*. 2020 Jan 2; 16(1):158-60.
10. Kumar T, Shrivastava A, Kumar A, Laserson KF, Narain JP, Venkatesh S, Chauhan LS, Averhoff F. Viral hepatitis surveillance—India, 2011–2013. *MMWR. Morbidity and mortality weekly report*. 2015 Jul 24; 64(28):758.
11. Reddy DC. Elimination of viral hepatitis: Evolution and India's response. *Indian Journal of Public Health*. 2019 Oct 1; 63(4):275.
12. National Viral Hepatitis Control Program (NVHCP). Available from: [https://www.nhp.gov.in/national-viral-hepatitis-control-program-\(nvhcp\)\\_pg](https://www.nhp.gov.in/national-viral-hepatitis-control-program-(nvhcp)_pg) [Accessed: 23 May 2020].
13. Noah N. The STROBE initiative: Strengthening the reporting of Observational studies in epidemiology (STROBE). *Epidemiol Infect*. 2008; 136(7):865.
14. Yasobant S, Trivedi P, Saxena D, Puwar T, Vora K, Patel M. Knowledge of hepatitis B among healthy population: A community-based survey from two districts of Gujarat, India. *Journal of family medicine and primary care*. 2017 Jul;6(3):589.
15. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*. 2013 Apr;35(2):121-6.
16. Israel GD. Determining sample size.
17. Nalli SK, Sinha T, Arora G, Khan QH. A study on knowledge attitude and practices related to hepatitis B infection among nursing students of government nursing college, Jagdalpur, Bastar, Chhattisgarh. *Int J Community Med Public Health* 2017; 4:3407-12.
18. Rathi A, Kumar V, Majhi J, Jain S, Lal P, Singh S. Assessment of knowledge, attitude, and practices toward prevention of hepatitis B infection among medical students in a high-risk setting of a newly established medical institution. *J Lab Physicians* 2018; 10:374-9.
19. ulHaq N, Hassali MA, Shafie AA, Saleem F, Farooqui M, Aljadhey H. A cross sectional assessment of knowledge, attitude and practice towards Hepatitis B among healthy population of Quetta, Pakistan. *BMC Public Health*. 2012 Dec 1;12(1):692.
20. Rabbanie Tariq Wani, Hibba Dar, Khalid JavidBhat and S.MuhammadSalim Khan. (2017); A Cross Sectional Assessment of Knowledge, Attitude and Practice towards Hepatitis B among Female Health Care Workers of Kashmir Valley. *Int. J. of Adv. Res.* 5 (May). 1513-1523
21. Rajamoorthy Y, Taib NM, Munusamy S, Anwar S, Wagner AL, Mudatsir M, Müller R, Kuch U, Groneberg DA, Harapan H, Khin AA. Knowledge and awareness of hepatitis B among households in Malaysia: a community-based cross-sectional survey. *BMC public health*. 2019 Dec 1;19(1):47.
22. Acharya SK, Madan K, Dattagupta S, Panda SK. Viral hepatitis in India. *The National medical journal of India*. 2006 Jul 1; 19(4):203-17.