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Original Research Article

Multimedia education program on knowledge and attitude regarding management, prevention of complication and side-effects of drugs on hepatitis-B among hepatitis patients: a pre-experimental study

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ABSTRACT

Background: Hepatitis is considered a public health challenge on the Asian continent. However, due to the paucity of the data, the exact burden of the condition has not been established. Better disease-related knowledge will help to improve attitudes toward managing the complications and side effects and also prevent the further spread of infection.
Methods: A hospital-based pre-experimental study was undertaken with 60 hepatitis B patients. Knowledge and attitude were assessed using demographic data, a 30-item knowledge questionnaire, and 16-item Likert scale responses, respectively. SPSS V20.0 was used for data analysis and interpretation. To do the analysis, a paired t-test and descriptive statistics, along with chi-square analysis were done to check the association level.
Results: The result showed that in the pre-test, 41 (68.3%) of the participants had inadequate knowledge, 19 (31.7%) had moderate knowledge, and none of the study participants had adequate knowledge. Furthermore, 60 (100%) participants had a neutral attitude, and none of the participants had an unfavorable and favorable attitude toward hepatitis B patients. The paired "t" test value was found to be 18.67 for knowledge level and 25.25 for attitude level, which was highly significant at $p<0.05$ level. Also, we have observed a strong positive linear correlation between knowledge and attitude, and the calculated "r" value is 0.741*.
Conclusions: The findings of the study indicate that hepatitis B patients have a lack of knowledge and attitude which may lead to the further spread of infection in the community and hospital itself. Extensive health education, community reach, and health workers participation can have a rational control over the management of the disease.

Keywords: Attitude, Hepatitis-B patients, Knowledge, Multimedia education program, Prevention of complication, Side effects of drugs

INTRODUCTION

Hepatitis B is a viral infection of the liver that is transmitted from an infected person to another through direct blood-to-blood contact, semen, or vaginal fluid. Although the route of transmission is similar to that of the HIV (human immunodeficiency virus), the virus is 100 times more virulent and may live outside the body for up to a week. During this time, a virus can infect a person who is not protected from the virus.[1] HBV is present in blood, semen, and vaginal fluids and is transmitted primarily through sexual activity. Another major transmission route is the sharing of injection drug equipment (including needles, cookers, and tourniquets) and, to a lesser extent, non-injection drugs (cocaine straws and crack pipes) due to the possibility of exposure to blood. Pregnant mothers with hepatitis B may spread the virus to their offspring, most likely after childbirth.[2]

According to the World Hepatitis Alliance report, Africa was the highest hit by hepatitis in the world, with more than 8% for hepatitis B and 10% for hepatitis C in some regions. Mostly, indigenous community members in densely congested areas have the highest prevalence. In the USA, the hepatitis B-affected population ranges from 2-8%. Hepatitis is also more common in Europe, where injecting drug users are co-infected with hepatitis and HIV/AIDS, with a range of 16-33% and more than 90% being affected. One of the most important aspects of hepatitis B is prevention. The report shows that 65% of hepatitis B and 75% of hepatitis C patients don't even know they are infected with hepatitis. In Europe, 9 million people are chronically infected with hepatitis C, and about 14 million are infected with hepatitis B, with 1.5 million HIV infections, which is a matter of concern.[3]

HBV is part of the *Hepadnavirdae* family in the genus *Orthohepana* virus. Most of the time, the risk of HBV infection will increase with travel. Currently, the HBV virus is causing hepatitis, hepatocellular carcinoma (HCC), and liver cirrhosis worldwide, causing mortality ranging from 500,000 to 1.2 million per year.[2] The report shows that in the year between 1992 and 2003, 9% of all the reported cases in the Netherlands were travel-related. Also, older male sex (41-51 cases) can increase the chance of HBV infection as there are possibly high-risk behaviours associated with unsafe sex. However, as the intubation time for HBV is long, the researchers were unable to exclude the claim of acute HBV infections prior to travel. The recent data also showed that the places with high alcohol consumption have relatively more cases of hepatitis B, as unprotected sex and multiple sexual partners are very common practices.[4]

A study reported that around 40 million HBV carriers are in India, which constitutes 10-15% of the entire HBV population worldwide, which is cause for concern. As the hepatitis B cases are growing, it is estimated that over 100,000 Indians die due to HBV infection, and the positivity ranges from 2 to 4.7%. The blooming population in India also poses a threat of spreading HBV, whereas the study shows that more than 1 million people in India have the lifetime risk of developing HBV infection out of 25 million newly born infants.[3] Two agents are currently available for prophylaxis against hepatitis B viral infection. The first is hepatitis B immune globulin (HBIG), which provides temporary protection from HBV. The second is the hepatitis B vaccine, which has had a significant impact on health care workers to date. Recently, the FDA approved a synthetic nucleoside analog, lamivudine (Epivir-HBV™), for use in patients with chronic hepatitis B viral infection associated with evidence of viral replication and active liver inflammation.[5] But despite the introduction of hepatitis B virus (HBV) vaccination programs, chronic hepatitis B (CHB) remains an important disease burden worldwide.[6] Currently, HBV treatment has improved in India. However, the effort is limited due to a lack of a hepatitis registry, good community-based epidemiology, and serological epidemiological studies.[7]

Therefore, this study was planned to assess the knowledge and attitude regarding management, prevention of complications, and side effects of drugs on hepatitis B among the hepatitis B patients. The findings of this study will help the medical and nursing fraternity come up with new ideas to tackle hepatitis B-related drug complications and side effects and also improve patients knowledge regarding hepatitis B.

METHODS

Study design and population

A hospital-based pre-experimental study with a one-group pre and post-test design was undertaken on hepatitis B patients at KCG Hospital, Malleswaram, Bengaluru, in the years 2022-2023. A total of 60 hepatitis B patients have participated in the study.

Study setting

Bangalore (also known as Bengaluru) is the capital of Karnataka state, India. This study was conducted at KCG Hospital, which is a public hospital situated at Malleswaram Circle, Bengaluru.

Sample size and sampling procedures

60 patients who were diagnosed with hepatitis B and who were also admitted to the hospital were selected using the non-probability convenience sampling technique based on the inclusion criteria. The patients who were willing to participate in the study and gave their consent were included. Furthermore, patients who had developed a hepatitis complication, had an altered level of consciousness, and were not available at the time of data collection were excluded from the study.

Ethical consideration

Institutional ethics committee approval was obtained before the research and actual data collection. The study was done in KCG hospital with the approval of the institutional ethics committee. A consent sheet was prepared in English with descriptions of the impact of the study on the respondents and attached to the tool on a separate page.

Data collection instrument

The investigator has developed the instruments for data collection. The validity and reliability of the tools were checked with the help of nursing experts and a biostatistician. The instrument was divided into three sections. Section A included demographic characteristics such as age in years, gender, religion, education, occupation, monthly income, and family history of

hepatitis. Section B included the structured knowledge assessment questionnaire. The questions were formulated based on general information regarding hepatitis (9 items), management of hepatitis B (7 items), prevention of complications regarding hepatitis B (8 items), and the side effects of drugs regarding hepatitis B (5 items). Furthermore, Section C included the Likert's attitude scale and the responses (strongly agree, agree, uncertain, disagree, strongly disagree). Additionally, for the scoring interpretation, '1' was assigned to the correct response and a '0' was assigned to the incorrect response in all section B items, for a total score of 30 to interpret the level of knowledge. For the Likert's attitude scale, a positive question score of '5' was awarded for strongly agree, '4' for agree, '3' for being uncertain, '2' for disagree and '1' for strongly disagree. Furthermore, for the negative question, strongly agree was awarded to '1', '2' for agree, '3' for uncertain, '4' for disagree, and '5' for strongly disagree.

Thus, a total score of 80 was awarded. In order to establish the reliability of the tool, the split-half method was used. The calculated 'r' value for the knowledge scale was 0.92 and 0.82 for the Likert's attitude scale, indicating that the tool was reliable.

Data collection technique

Formal permission was obtained from the concerned authority and the ethical committee of KCG Hospital. The data were collected from February 2 to March 31, 2023, and were collected by the researcher itself. The patients were requested to respond to the questionnaires through pen and paper with a consent form attached.

On the front page of the response sheet and also verbally, the auto drivers were instructed not to use any internet source and not to consult with other patients to choose the right response. Around 15 minutes were taken for each subject to complete the questionnaires.

Data quality control

Data quality control was done, and the questionnaires were properly pre-tested and designed. 10% of the total participants completed the questionnaires at a rural community health centre far from the original test site to ensure that the questions were understandable to the respondents. Based on their responses, further modifications were made.

Data processing and analysis

The data was analyzed by Statistical Package for Social Sciences (SPSS) version 20.0. To do the analysis paired t-test and descriptive statistics were done where mean, standard deviation, frequency, and percentage were checked. chi-square analysis also was done to check the association level.

RESULTS

A total of 60 hepatitis B patients participated in this study. Out of the study participants, the majority, 43 (71.7%), were male, and 24 (40%) were in the age group of 21 to 30 years. 28 (46.7%) of the participants were Hindu, and the majority of 29 (48.3%) of them work as private employees. With regards to education, 24 (40%) of the participants had higher secondary education and had an income of 5000 to 10000 rupees per month 22 (36.7%). Furthermore, every participant 60 (100%) heard about hepatitis, and the sources of information were health care professionals and family members 18 (30%). However, none of the 60 (100%) of the study participants had any family history of hepatitis.

Table 1: Description of socio-demographic variables of patients with hepatitis B (N=60).

Demographic variables	Categories	Frequency	Percentage
Age (in years)	21-30	24	40.0
	31-40	19	31.7
	41-50	17	28.3
Gender	Male	43	71.7
	Female	17	28.3
Religion	Hindu	28	46.7
	Muslim	12	20.0
	Christian	18	30.0
	Others	2	3.3
Educational status	No formal education	2	3.3
	Primary	13	21.7
	Secondary	17	28.3
	Hr. secondary	24	40.0
	Graduate and above	4	6.7
Occupation	Unemployed	2	3.3
	Agriculture	7	11.7
	Govt. employee	13	21.7
	Pvt. employee	29	48.3
	Housewife	5	8.3
	Coolie/daily wages	4	6.7
Family income per month (Rs)	<5000	10	16.7
	5001-10000	22	36.7
	10001-15000	19	31.7
	>15000	9	15.0
Family history of hepatitis	Yes	-	-
	No	60	100.0
Heard about hepatitis	Yes	60	100.0
	No	-	-
Source of information	Magazine	12	20.0
	Health care professional	18	30.0
	Family members	18	30.0
	Friends	12	20.0

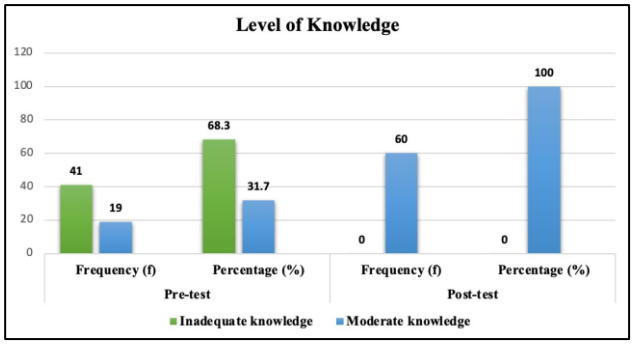

Figure 1: Frequency and percentage distribution of patients with hepatitis B according to pre and post-test level of knowledge.

Figure 1 depicts the pre-test and post-test frequency and percentage distribution of knowledge about hepatitis B. The result shows that in the pre-test, 41 (68.3%) of the participants had inadequate knowledge, 19 (31.7%) had moderate knowledge, and none of the study participants had adequate knowledge. Whereas, in the post-test, the result shows that all 60 participants (100%) had moderate knowledge, and none of them had inadequate or adequate knowledge. It shows that after the multimedia education program, the subject knowledge has improved, and the program is found to be effective.

Figure 2 depicts the pre-test and post-test frequency and percentage distribution of attitudes towards hepatitis B. The result shows that in the pre-test, 60 (100%) of the participants had a neutral attitude, and none of the participants had an unfavourable and favourable attitude toward hepatitis B patients. Whereas after the multimedia education program, all 60 participants (100%) had a favourable attitude towards hepatitis B. Therefore, it shows that the overall attitude has improved and the program has been found to be effective. Moreover, in the pre-test, the range was 44-49, the mean was 47.02, the SD was 1.44, and the mean percentage was 58.7%. Whereas in the post-test, the range was 65-71, the mean was 67.80, the SD was 1.86, and the mean percentage was 84.7%. and it can be clearly seen that the mean percentage improved after the post-test.

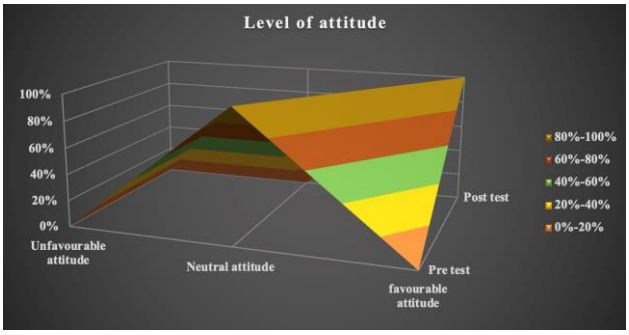

Figure 2: Percentage distribution of hepatitis B patients according to pre-test and post-test level of attitude.

Table 2 depicts the paired t-test analysis for the pre-test and post-test analysis. The table shows the mean difference, SD of difference, mean difference percentage, and statistical significance of knowledge regarding management, prevention of complications, and side effects of drugs on hepatitis among patients with hepatitis. The mean difference was 4.96, the SD was 0.75, the mean difference percentage was 16.5, and the t-value was found to be 18.67, which was highly significant at $p<0.05$ level.

Table 2: Paired t-test analysis for the significance of pre and post-test level of knowledge hepatitis among patients with hepatitis B (N=60).

Knowledge	Max. score	Mean difference	SD of difference	% of mean difference	Paired t-value	P value
General information regarding hepatitis B	8	1.06	1.26	13.2	6.55	p<0.05
Management of hepatitis B	10	1.78	1.54	17.8	8.96	p<0.05
Prevention of complications of hepatitis B	8	1.13	1.39	14.1	6.29	p<0.05
Side effects of drugs	4	0.98	1.33	24.5	5.71	p<0.05
Overall	30	4.96	0.75	16.5	18.67	p<0.05

Note: *- denotes significant at 0.05 level at 59df (i.e. p<0.05)

Table 3: Paired t-test analysis for the significance of pre and post-test level of attitude on hepatitis patients with hepatitis B (N=60).

Attitude	Max. score	Mean difference	SD of difference	% of mean difference	Paired t-value	P value
Overall	80	20.78	2.00	25.9	24.25	P<0.05

Note: *- denotes significant at 0.05 level at 59df (i.e. p<0.05)

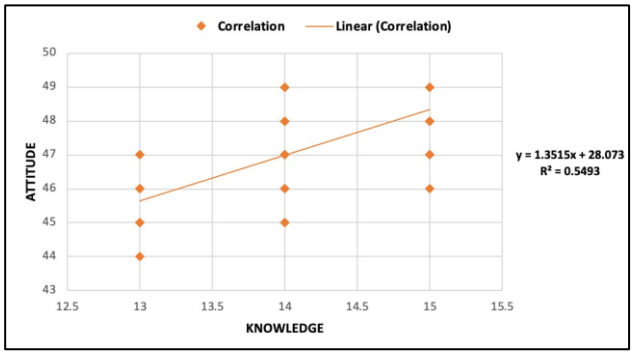

Figure 3: Scatter graph of correlation between knowledge and attitude.

A paired "t" test was performed to determine the significance of the pre- and post-test levels of attitude regarding hepatitis. The Table 3 shows that the mean, standard deviation, and mean percentage of improvement in attitude regarding hepatitis B among hepatitis B patients where the maximum score was 80, the mean difference was 20.78, the SD of the difference was 2.00, the mean difference percentage was 25.9, and the t-value was found to be 24.25, which was highly significant at $p<0.05$ level. The study also found a significant strong positive correlation between knowledge and attitude, and the calculated R-value is 0.741*.

Table 4 depicts the knowledge level and demographic variables. The result shows that the association between educational status (χ^2=28.69), occupation (χ^2=19.09), family income (χ^2=9.98), and the source of information (χ^2=7.868) was found to be statistically significant. Other demographic variables such as age, gender, religion, family history of hepatitis, and heard about hepatitis were found to be statistically non-significant.

Table 4: Association between mean difference of knowledge on hepatitis among patient with hepatitis B with selected demographic variables.

Demographic variables	Categories	Sample (60)		Knowledge				χ^2 value	P value
				≤median		>median			
		No.	%	No.	%	No.	%		
Age (in years)	21-30	24	40.0	18	43.9	6	31.6	4.652, df=2, NS	p>0.05
	31-40	19	31.7	13	31.7	6	31.6		
	41-50	17	28.3	10	24.4	7	36.8		
Gender	Male	43	71.7	29	70.7	14	73.7	0.056, df=1, NS	p>0.05
	Female	17	28.3	12	29.3	5	26.3		
Religion	Hindu	28	46.7	19	46.3	9	47.4	3.56, df=3, NS	p>0.05
	Muslim	12	20.0	10	24.4	2	10.5		
	Christian	18	30.0	10	24.4	8	42.1		
	Others	2	3.3	2	4.9	0	0		
Educational status	No formal education	2	3.3	2	4.9	0	0	28.69, df=4, S	p<0.05
	Primary	13	21.7	13	31.7	0	0		
	Secondary	17	28.3	16	39.0	1	5.3		
	Hr. Secondary	24	40.0	10	24.4	14	73.7		
	Graduate and above	4	6.7	0	0	4	21.1		
Occupation	Unemployed	2	3.3	2	4.9	0	0	19.09, df=5, S	p<0.05
	Agriculture	7	11.7	7	17.1	0	0		
	Govt. employee	13	21.7	3	7.3	10	52.6		
	Pvt. employee	29	48.3	21	51.2	8	42.1		
	Housewife	5	8.3	5	12.2	0	0		
	Coolie/daily wages	4	6.7	3	7.3	1	5.3		
Family income per month (Rs)	<5000	10	16.7	8	19.5	2	10.5	9.98, df=3, S	p<0.05
	5001-10000	22	36.7	19	46.3	3	15.3		
	10001-15000	19	31.7	8	19.5	11	57.9		
	>15000	9	15.0	6	14.6	3	10.5		
Source of information	Magazine	12	20.0	8	19.5	4	21.1	7.868, df=3, S	p<0.05
	Health care professional	18	30.0	10	24.4	8	42.1		
	Family members	18	30.0	11	26.8	7	36.8		
	Friends	12	20.0	12	29.3	0	0		

Note: S-Significant at 5% level (i.e. p<0.05), NS-Not significant at 5% level (i.e. p>0.05).

Table 5: Association between mean difference of attitude on hepatitis among patients with hepatitis B with their selected demographic variables.

Demographic variables	Categories	Sample (60)		Attitude				χ^2 value	P value
				≤median		>median			
		No.	%	No.	%	No.	%		
Age (in years)	21-30	24	40.0	16	42.1	8	36.4	1.58, df=2, NS	p>0.05
	31-40	19	31.7	11	28.9	8	36.4		
	41-50	17	28.3	11	29.0	6	27.3		
Gender	Male	43	71.7	26	68.4	17	77.3	0.53, df=1, NS	p>0.05
	Female	17	28.3	12	31.6	5	22.7		
Religion	Hindu	28	46.7	16	42.1	12	54.5	2.36, df=3, NS	p>0.05
	Muslim	12	20.0	9	23.7	3	13.6		
	Christian	18	30.0	11	28.9	7	31.8		
	Others	2	3.3	2	5.3	0	0		
Educational status	No formal education	2	3.3	2	5.3	0	0	14.96, df=4, S	P<0.05
	Primary	13	21.7	12	31.6	1	4.5		
	Secondary	24	28.3	12	31.6	12	54.5		
	Hr. secondary	17	40.0	16	39.0	1	15		
	Graduate and above	4	6.7	0	0	4	18.2		
Occupation	Unemployed	2	3.3	2	5.3	0	0	19.064, df=5, S	P<0.05
	Agriculture	7	11.7	6	15.8	1	4.5		
	Govt. employee	13	21.7	2	5.3	11	50.0		
	Pvt. employee	29	48.3	20	52.6	9	40.9		
	Housewife	5	8.3	5	13.2	0	0		
	Coolie/daily wages	4	6.7	3	7.9	1	4.5		
Family income per month (Rs)	<5000	10	16.7	8	21.1	2	9.1	9.950, df=3, S	P<0.05
	5001-10000	22	36.7	18	47.4	4	18.2		
	10001-15000	19	31.7	8	21.1	11	50.0		
	>15000	9	15.0	4	10.5	5	22.7		
Source of information	Magazine	12	20.0	7	18.4	5	22.7	2.703, df=3, NS	P>0.05
	Health care professional	18	30.0	11	28.9	7	31.8		
	Family members	18	30.0	10	26.3	8	36.4		
	Friends	12	20.0	10	26.3	2	9.1		

Note: S-Significant at 5% level (i.e., p<0.05), NS- not significant at 5% level (i.e., p>0.05).

Table 5 depicts the association between attitude level and demographic variables. The result shows that the association between educational status (χ^2=14.96), family income (χ^2=9.950), and occupation (χ^2=19.064) was found to be statistically significant. Furthermore, the rest of the variables, such as age, gender, religion, and source of information, were found to be statistically non-significant.

DISCUSSION

India has an approximately 3.0% HBV career rate, with a high prevalence rate in the tribal population. Due to the lack of basic medical facilities in remote areas, many of the tribal populations don't get the required treatment, which can be fatal for the patients and also for the people nearby. Due to this, with a population of more than 1.35 billion, India has more than 37 million HBV carriers, which contributes a large proportion of this HBV burden.[8] The purpose of the present study was to assess the knowledge and attitude regarding management, prevention of complications, and side effects of drugs on hepatitis B among hepatitis B patients. Currently, there is little research data available related to this statement. The findings of the present study suggest that in the pre-test, 41 (68.3%) of the participants had inadequate knowledge, 19 (31.7%) of them had moderate knowledge, and none of the study participants had adequate knowledge. Whereas, in the post-test, the result shows that all 60 participants (100%) had moderate knowledge, and none of them had inadequate or adequate knowledge. However, the findings were inconsistent when compared with a similar study done in Gambia where the result shows that the majority of the participants have an adequate level of knowledge regarding hepatitis B.[9] This discrepancy might be due to the study setting and large sample size. However, some study findings done in Pakistan, Malaysia, and India were consistent with our result.[10-13]

One of the objectives of our research was to find out the attitude towards hepatitis B. The result shows that in the

pre-test, 60 (100%) of the participants had a neutral attitude, and none of the participants had an unfavourable and favourable attitude toward hepatitis B patients. However, after the education, all the participants 60 (100%) developed a favourable attitude. A similar negative attitude of 309 (79.2%) was found in the study done in Pakistan and Malaysia.[10-12] Although a higher attitude was found in a study done in Gambia where two-thirds 107 (70%) of the participants had a positive attitude towards hepatitis B infection.[10] This difference in the result could also be due to the fact that African nations have one of the highest numbers of hepatitis B patients. So the health information and higher education the people are receiving could also be more. Due to medical advancement, the ratio of hepatitis B is decreasing in India, which is also impacting the knowledge and attitude towards hepatitis B.

Our research has found multiple associations between knowledge level and demographics that were found to be statistically significant, such as educational status (χ^2=28.69), occupation (χ^2=19.09), family income (χ^2=9.98), and the source of information (χ^2=7.868). Some of the similar associations were also found in some studies.[10-12] Furthermore, a significant association was also found between attitude level and demographic variables such as educational status (χ^2=14.96), family income (χ^2=9.950), and occupation (χ^2=19.064). A positive correlation between knowledge and attitude was found in this study, which reaffirms the relationship between knowledge and attitude. It can be concluded that adequate knowledge can lead to a positive attitude that can manage and improve the management of complications and side effects of drugs in hepatitis B. The findings are not in line with the result of one of the previous studies, where the study showed no significant predictor of attitude among the sociodemographic and clinical characteristics variables. However, such differentiations in the results could be a representation of people's education, the governmental approach to tackling hepatitis B, and mass health education to the general public.

To our knowledge, a small number of studies have been conducted regarding hepatitis B in Western countries compared to Asian countries, as the majority of hepatitis B cases are found in Asian countries. A study was done in Melbourne, Australia regarding the health literacy of chronic hepatitis B patients, which claimed to be the largest study done in Australia to investigate the knowledge of chronic hepatitis B patients who are attending a special outpatient clinic.[14] The result suggested that most of the participants had a higher level of knowledge (7.5 out of 12 points) compared to previous studies. Also, the study found a statistically significant association between knowledge score and demographic variables such as gender (p=0.0268**), English literacy (p=0.045**), educational level (p=0.05**), having seen a clinician previously (p=0.010**), knowing anyone else with HBV (p=0.007**), Friend comfortable (p=0.049**). However, we have observed that the majority of the study has a significant association between knowledge and educational level, so in conclusion, we can say that patients with a higher educational level have higher knowledge regarding hepatitis B, its treatment, side effects, etc. The higher knowledge score in the study might be due to the higher literacy level and better sources of information in Australia. However different cultural factors and linguistically salient information from different countries can also play a role in the results of different research studies.

Education plays a vital role and has a definite effect on improving knowledge and also shaping negative views and attitudes about this disease. Early education regarding hepatitis B can help improve the knowledge of urban and rural populations. A better understanding of hepatitis B will improve the treatment outcome, reduce negative societal image, and reduce morbidity, stress, and anxiety regarding hepatitis B.

The study was conducted at one hospital, which led to a small sample size. Also, the sampling technique used was non-randomized purposive sampling, and the study was limited to only hepatitis B patients. Hence, the findings of the study cannot be generalized to a large population.

CONCLUSION

There are substantial burdens of HBV infection in Asia and the Pacific Islands, sub-Saharan Africa, the Amazon Basin, and Eastern Europe, despite the disease's frequency being unevenly distributed throughout the world. Still, a number of issues in hepatitis B management remain controversial or unresolved, such as identifying treatment candidates, managing partial or nonresponses, and predicting treatment response. The authors hope that the study findings will support the stakeholders, teachers, doctors, and nurses in making a significant decision to handle hepatitis B patients more efficiently.

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