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**CROSS SECTIONAL STUDY OF VIRAL HEPATITIS AWARENESS
AMONG PATIENTS FROM PUBLIC SECTOR HOSPITALS OF LAHORE
CITY OF PAKISTAN**

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ABSTRACT

Viral Hepatitis is the eighth most leading reason of fatalities all over the world which caused 1.44 million deaths in 2010. HBV and HCV are the principal causes of Liver Cirrhosis and Hepatocellular Carcinoma (HCC). For conducting a cross-sectional study, 407 patients were enrolled using Non-probability Purposive Sampling Technique. All the demographic variables were significantly different among the three hospitals selected for the study (except marital status). The average knowledge score was calculated to be 19.4 ± 9.9 . Males were observed to have had a higher mean score in comparison to females; 24.87 ± 9.43 vs. 15.82 ± 8.61 . A noteworthy difference was observed in all the analyzed demographic variables and knowledge scores (p -value < 0.05). Multinomial regression analysis was applied, with perception and awareness of hepatitis and the demographics. All explanatory variables were statistically significant, with considerably small standard errors, which show their consistency (p -value < 0.05). This study revealed that patients already diagnosed with any type of hepatitis generally lacked understanding and knowledge about their condition. Patients from Services Hospital were discovered to have the maximum score among all, which might be due to the guidance and awareness program arranged by their paramedical staff.

INTRODUCTION

Hepatitis is the inflammation of liver that results due to viruses and excessive use of drugs and alcohol. In viral hepatitis a group of viruses such as Hepatitis A (virus; HAV), Hepatitis B (virus; HBV), Hepatitis C (virus; HCV), Hepatitis D (virus; HDV), Hepatitis E (virus; HEV) or Hepatitis G (virus; HGV) are involved that are epidemiologically and etiologically distinguished. The common mode of transmission of HAV and HEV is contaminated food and water. Whereas HBV, HCV and HDV are chiefly transmitted through parenteral contact with infected body fluids.¹

Viral Hepatitis (VH) comes eighth worldwide in the most leading causes of mortality, resulting in 1.44 million deaths in 2010. Liver Cirrhosis and Hepatocellular Carcinoma (HCC) are primarily caused by HBV and HCV. According to the World health organization (WHO) report, there are 350 million people with HBV infection and approximately 170 million people infected with HCV.^{1,2}

Pakistan is among the countries which have the largest growing population with high prevalence and risk factors of hepatitis.³ According to the agenda of The United Nations; by 2030 they intend to eliminate the epidemics of many diseases, that also includes hepatitis, by promoting fundamental access to education in order to prevent the spread of infectious diseases such as hepatitis.⁴ The most common clinical presentation of viral hepatitis includes fever, abdominal pain, nausea, loss of appetite, pale feces, dark urine and jaundice.^{3,5} The most commonly used diagnostic tools for the detection of specific VH antigen or antibody include Enzyme Linked Immuno Solvent Assay (ELISA), and Molecular Assay; as in Polymerase Chain Reaction (PCR), which are used for the quantification and qualification of the disease.⁵

A few investigations have demonstrated that the awareness of hepatitis can be influenced by family income, age, awareness about the disease, education and health literacy.^{6,7} The perceptions about the disease vary according to the individuals' occupation and characteristics. According to the study conducted in Ethiopia, inadequate knowledge score was observed among health professionals and students.⁸ Studies completed in USA and China broadly cover the knowledge score with age, gender, study site and earlier HCV treatment.^{7,9} Lack of awareness was observed in Pakistani population.¹⁰

However, insufficient data is available regarding the understanding of viral hepatitis among the patients suffering from different forms of hepatitis. The aim of present study is to estimate the perception about viral hepatitis and to identify possible gaps and strengths.

METHODOLOGY

POPULATION STUDIED

This was a cross-sectional study conducted from December 2018 to April 2019, where a sample size of 407 was calculated with 95% confidence interval, margin of error was 0.7 and mean score of perception was 25.3 ± 7.2^3 . A nonprobability purposive sampling technique was used in which every subject meeting the criteria of inclusion was selected until the required sample size was achieved in this setting. Individuals were previously informed about the study and the eligibility criteria for participants was: both genders, more than 18 years of age, free from psychoactive drug use, agreement to inclusion, and signed, informed consent. The local ethical committee (The University of Lahore) approved the study (IRB-UOL-FAHS/00307A). A total of 407 questionnaires of knowledge regarding hepatitis was obtained from three public sector hospitals in Lahore i.e.: (1) Mayo Hospital; comprising 153 patients both indoor and outdoor, (2) Services Hospital; comprising 145, both indoor and outdoor patients and (3) Jinnah Hospital; comprising 109 both indoor and outdoor patients. These individuals included in the study were only those with acute or chronic cases of viral hepatitis. Interviewers collected data from indoor and outdoor departments and only applied the questionnaires to those who agreed to participate.

DATA COLLECTION TOOL

The questionnaire was composed of two parts: (1) Social-demographic Characteristics; and (2) Perception and Awareness of Viral Hepatitis. Social-demographic characteristics included gender, age, education level, monthly family income, marital status, number of people in the family, and the type of hepatitis (acute/ chronic).

Viral hepatitis perception was evaluated by the participants' understanding of the proposed questions. The questionnaire was composed of nine groups covering aspects about viral hepatitis including general information, transmission, prevention, clinical manifestations, risk factors, and complications. The initial version of the questionnaire was structured in Brazilian Portuguese language and was developed from a questionnaire applied in a previous study^{3,11}. The filled questionnaire was then piloted with 40 respondents for its acceptability and consistency. Participants were interviewed face-to-face. At the end of the interview, the correct answers were shown to each volunteer.

SCORE OF KNOWLEDGE

A net Viral Hepatitis Perception score was created based on the average of correct answers of all participants' responses (19.4). The perception was divided in two scores; "low" (0-19 correct answers) and "desirable" (20-48 correct answers). Associations between socio demographic characteristics and perception were also evaluated. Awareness has been categorized into parameters such as general aspects, risk, diagnosis, symptoms, transmission, complications and prevention.^{3,11}

Statistical analysis

Descriptive statistics were generated for the responses. The chi-squared test, ANOVA and t-test for independence were used to compare categorical and continuous variables respectively among the perception score groups. The variables

that were associated with perception score categories were inserted into the logistic regression model using a forward stepwise method. The 95% CIs of the estimated odds ratios were also calculated, and a *p*-value was generated using the Statistical Package for the Social Sciences (SPSS v. 24.00).

Variables	Total, 407 n (%)	Mayo Hospital (n=153)	Services Hospital (n=145)	Jinnah Hospital (n=109)	<i>p</i> value
Gender					
Male	163(40.0)	29(17.8)	95(58.3)	39(23.9)	0.000
Female	244(60.0)	124(50.8)	50(20.5)	70(28.7)	
Age					
<40	182(44.7)	75(41.2)	33(18.1)	74(40.7)	0.000
≥40	225(55.3)	78(34.7)	112(49.8)	35(15.6)	
Education					
Illiterate	228(56.0)	122(53.5)	63(27.6)	43(18.9)	0.000
Primary	28(6.9)	7(25.0)	21(75.0)	0(0.0)	
Middle	64(15.7)	16(25.0)	20(31.3)	28(43.8)	
Secondary	44(10.8)	2(4.5)	25(56.8)	17(38.6)	
Undergraduate	27(6.6)	3(11.1)	12(44.4)	12(44.4)	
Graduate	12(2.9)	1(8.3)	4(33.3)	7(58.3)	
Post Graduate	2(0.5)	2(100.0)	0(0.0)	0(0.0)	
Others	2(0.5)	0(0.0)	0(0.0)	2(100.0)	
Income					
Low	136(33.4)	66(48.5)	45(33.1)	25(18.4)	0.000
Intermediate	111(27.3)	48(43.2)	30(27.0)	33(29.7)	
High	160(39.3)	39(24.4)	70(43.8)	51(31.9)	
Marital Status					
Single	33(8.1)	5(15.2)	19(57.6)	9(27.3)	0.026
Married	369(90.7)	146(39.6)	123(33.3)	100(27.1)	
Widowed	4(1.0)	1(25.0)	3(75.0)	0(0.0)	
Divorced	1(0.2)	1(100.0)	0(0.0)	0(0.0)	
Residential area					
Urban	324(79.6)	106(32.7)	128(39.5)	90(27.8)	0.000
Rural	83(20.4)	47(56.6)	17(20.5)	19(22.9)	
Persons in home					
1	10(2.5)	6(60.0)	0(0.0)	4(40.0)	0.000
2	11(2.7)	3(27.3)	0(0.0)	8(72.7)	
3	68(16.7)	31(45.6)	24(35.3)	13(19.1)	
4	99(24.3)	42(42.4)	24(24.2)	33(33.3)	
5	94(23.1)	54(57.4)	15(16.0)	25(26.6)	
≥6	125(30.7)	17(13.6)	82(65.5)	26(20.8)	

Hepatitis					
Acute	233(57.2)	107(45.9)	36(15.5)	90(38.6)	0.000
Chronic	174(42.8)	46(26.4)	109(62.6)	19(10.9)	

RESULTS:

Table 1: Socio demographic characteristics of Patients

TABLE 1: The table shows the breakup of the selected sample with respect to the demographics. A total of 407 hepatitis patients were interviewed, majority of them were females (60%), with high Illiteracy rate (56.0%), married (90.7%), residents of urban areas (79.6%), had more than 6 persons in family (30.7%) and patients of acute hepatitis (57.2%). P-value, in the last column, is calculated to statistically signify the difference between the three selected hospitals. All the demographic variables were highly significantly different among the three hospitals (except marital status).

Table 2: Correct Responses regarding Awareness and Perceptions of Viral Hepatitis

Statements	n (%)	Mayo Hospital	Services Hospital	Jinnah Hospital	p value
General Information					
There is Hepatitis A	189(46.4)	19(12.4)	134(92.4)	36(33.0)	0.000
There is Hepatitis B	181(44.5)	8(5.2)	134(92.4)	39(35.8)	0.000
There is Hepatitis C	247(60.7)	48(31.4)	134(92.4)	65(59.6)	0.000
There is Hepatitis D	96(23.6)	10(6.5)	59(40.7)	27(24.8)	0.000
There is Hepatitis E	86(21.1)	6(3.9)	58(40.0)	22(20.2)	0.000
Viral hepatitis can be cured	197(48.4)	33(21.6)	133(91.7)	31(28.4)	0.000
There are vaccines for viral hepatitis	200(49.1)	41(26.8)	129(89.0)	30(27.5)	0.000

One cannot have the same form of hepatitis more than once	126(31.1)	30(19.6)	69(47.6)	27(24.8)	0.000
Agents that cause hepatitis	53(13.0)	9(5.9)	43(29.7)	1(0.9)	0.000
There are differences between acute and chronic hepatitis	94(23.1)	17(11.1)	44(30.3)	33(30.3)	0.000
Transmission					
By seafood	190(46.7)	25(16.3)	144(99.3)	21(19.3)	0.000
By blood	264(64.9)	54(35.3)	128(88.3)	82(75.2)	0.000
By sexual contact	164(40.3)	16(10.5)	120(82.8)	28(25.7)	0.000
By untreated water or vegetables	195(47.9)	26(17.0)	134(92.4)	35(32.1)	0.000
People at risk:					
A clinical laboratory worker	122(30.0)	21(13.7)	57(39.3)	44(40.4)	0.000
A hospital employee	137(33.7)	32(20.9)	63(43.4)	42(38.5)	0.000
A drug user	174(42.8)	33(21.6)	94(64.8)	47(43.1)	0.000
A person who has tattoos or piercings	95(23.3)	18(11.8)	46(31.7)	31(28.4)	0.000
Diagnosis					
By Blood test	277(68.1)	105(68.6)	109(75.2)	63(57.8)	0.013
Symptoms:					
Absence of symptoms	198(48.6)	52(34.0)	119(82.1)	27(24.8)	0.000
Symptoms can appear after years post infection	167(41.0)	44(28.8)	82(56.6)	41(37.6)	0.000
Fever	314(77.1)	104(68.0)	136(93.8)	74(67.9)	0.000
Jaundice	269(66.1)	111(72.5)	97(66.9)	61(56.0)	0.019
Complications:					
Cirrhosis	85(20.9)	12(7.8)	56(38.6)	17(15.6)	0.000
Liver cancer	188(46.2)	69(45.1)	83(57.2)	36(33.0)	0.001
Loss of body movements	170(41.8)	76(49.7)	63(43.4)	31(28.4)	0.002

Bleeding from the mouth	184(45.2)	84(54.9)	60(41.4)	40(36.7)	0.007
Blood in stool	103(25.3)	24(15.7)	64(44.1)	15(13.8)	0.000
Prevention:					
Disinfectant tanks and sewerage system	289(71.0)	80(52.3)	135(93.1)	74(67.9)	0.000
Treated water	266(65.4)	75(49.0)	143(98.6)	48(44.0)	0.000
Providing vaccine	181(44.5)	21(13.7)	128(88.3)	32(29.4)	0.000
Selecting blood donors without hepatitis	252(61.9)	76(49.7)	132(91.0)	44(40.4)	0.000
Using condoms	166(40.8)	19(12.4)	120(82.8)	27(24.8)	0.000

Perception and awareness about hepatitis is a multi-factor phenomena. Different factors play different roles in generating and developing this perception. **Table 2** shows the awareness and perception for all these factors individually. 1st column shows the score, both in absolute and in percentage form; columns 2, 3 and 4 show these scores for the three selected hospitals while the last column shows the p-value to signify the difference in perception, between the three hospitals.

When asked about the existence of hepatitis, majority were aware about the existence of hepatitis C (60.7%) whereas only 23.6% and 21.1% were aware about the existence of hepatitis D and E respectively. Among the three hospitals, respondents from Services Hospital had a higher level of knowledge about various types of hepatitis.

Majority were unaware about the remedy of viral hepatitis (48.4%) whereas patients from Services Hospital were more aware among the three hospitals. Only 19.6% patients from Mayo Hospital knew that one cannot have the same form of hepatitis more than once, whereas 24.8% and 47.6% patients from Jinnah and Services hospital respectively had knowledge regarding this question. Only a few of them were aware about the agents that cause hepatitis as 13.0% respondents had correctly marked the right response among the three hospitals. 23.1% were able to recognize the differences between acute and chronic hepatitis.

Transmission of hepatitis through blood was correctly answered by most patients. Majority were unaware that a person who has tattoos or piercings will be on risk of hepatitis, whereas almost 43% knew that a drug user might be at a higher risk on acquiring hepatitis. Many of the patients (68.1%) correctly knew that hepatitis can be diagnosed through blood test.

Cirrhosis as a complication of hepatitis was not correctly answered by majority of the patients.

Overall the highest percentage of correct responses was from the patients of Services Hospital. A significant difference was observed among all three setups regarding the responses of all questions.

Table 3: Knowledge Score according to Demographic characteristics of Patients

Variables	Mean of Knowledge Score(\pm SD)	Knowledge Score		<i>p</i> value
		Low	Desirable	
Gender				
Male	24.87+9.43	40(24.5)	123(75.5)	0.000
Female	15.82+8.61	163(66.8)	81(33.2)	
Age				
<40	18.27+9.42	100(54.9)	82(45.1)	0.032
\geq 40	20.39+10.33	103(45.8)	122(54.2)	
Education				
Illiterate	16.47+8.51	145(63.6)	83(36.4)	0.000
Primary	24.07+7.29	7(25.0)	21(75.0)	
Middle	17.81+11.51	32(50.0)	32(50.0)	
Secondary	25.91+9.36	11(25.0)	33(75.0)	
Undergraduate	28.81+8.10	5(18.5)	22(81.5)	
Graduate	27.00+5.72	1(8.3)	11(91.7)	
Post Graduate	14.00+0.00	2(100.0)	0(0.0)	
Others	37.00+0.00	0(0.0)	2(100.0)	
Income				
Low	17.12+9.13	85(62.5)	51(37.5)	0.000
Intermediate	18.13+9.89	66(59.5)	45(40.5)	
High	22.33+10.08	52(32.5)	108(67.5)	
Marital Status				
Single	25.88+8.81	8(24.2)	25(75.8)	0.001
Married	18.81+9.88	193(52.3)	176(47.7)	
Widowed	25.75+10.50	1(25.0)	3(75.0)	
Divorced	16.00+0.00	1(100.0)	0(0.0)	
Residential area				
Urban	20.23+10.30	147(45.4)	177(54.6)	0.000

Rural	16.36+7.96	56(67.5)	27(32.5)	
Persons in home				
1	17.40+4.72	7(70.0)	3(30.0)	0.000
2	20.45+9.72	3(27.3)	8(72.7)	
3	21.81+10.57	31(45.6)	37(54.4)	
4	17.94+9.08	61(61.6)	38(38.4)	
5	15.23+8.70	65(69.1)	29(30.9)	
≥6	22.58+10.28	36(28.8)	89(71.2)	
Hospital				
Mayo Hospital	13.10+5.23	130(85.0)	23(15.0)	0.000
Services Hospital	28.98+4.97	10(6.9)	135(93.1)	
Jinnah Hospital	15.65+10.45	63(57.8)	46(42.2)	

TABLE 3: Perception and awareness have been further modified into knowledge scores for making the comparison easier and mathematical. The knowledge score has been calculated on the basis of average correct responses from all of the patients. Then it has been further categorized into low and desirable knowledge scores taking 19.4 ± 9.9 as cut off, scores from 0 to 19 considered as low and 20 to 48 were considered as desirable scores. From the three hospitals, only patients from Services Hospital have the desirable score i.e. 28.3 ± 5.0 , whereas the patients from Jinnah and Mayo Hospital have scores 15.7 ± 10.5 and 13.1 ± 5.2 respectively. Patients from Mayo Hospital have the lowest score among all. From **Table 3** we came to know that males have a higher mean score in comparison to females i.e. 24.87 ± 9.43 vs. 15.82 ± 8.61 . With regard to education, desirable knowledge score was most common (91.0%) among graduated patients. Whereas patients belonging to a higher income group showed the maximum percentage (67.5%) of desirable knowledge score. Residents of urban areas had higher mean scores of correct responses in comparison to rural residents. Number of persons in family played a vital role in achieving maximum desirable score (71.2%) with mean scores as 22.58 ± 10.28 among all the others. With regard to hospitals, Services Hospital achieved the maximum desirable score (93.1%). There is a significant difference observed in all the studied demographic variables and knowledge scores (p -value <0.05).

Table 4: Multivariate Logistic Regression Model for Knowledge Scores

Variables	B	S.E	Wald	df	Sig.	Exp(B)
Constant	-4.841	0.805	36.153	1	0.000	0.008
Educational Level	0.521	0.091	32.893	1	0.000	1.684-0.627
Persons in Home	0.292	0.103	8.000	1	0.005	1.339-0.572
Hospital	0.512	0.156	10.777	1	0.001	1.669-0.625
Hepatitis type	1.674	0.252	44.248	1	0.000	5.335-0.842
Residential Area	-0.811	0.299	7.371	1	0.007	0.444-0.309

TABLE 4:

Multinomial regression analysis is applied with perception and awareness of hepatitis being a dependent variable and the demographics, given in 1st column, as its explanatory variables. The model is statistically viable with -2 Log Ratio and is significant on chi-square scale with classification index being 83.7%. Evidently, all explanatory variables are statistically significant with considerably small standard errors which shows their consistency (p-value < 0.05). As a matter of fact, awareness and perception about hepatitis depends positively upon all the given explanatory variables except residential area, upon which it depends negatively.

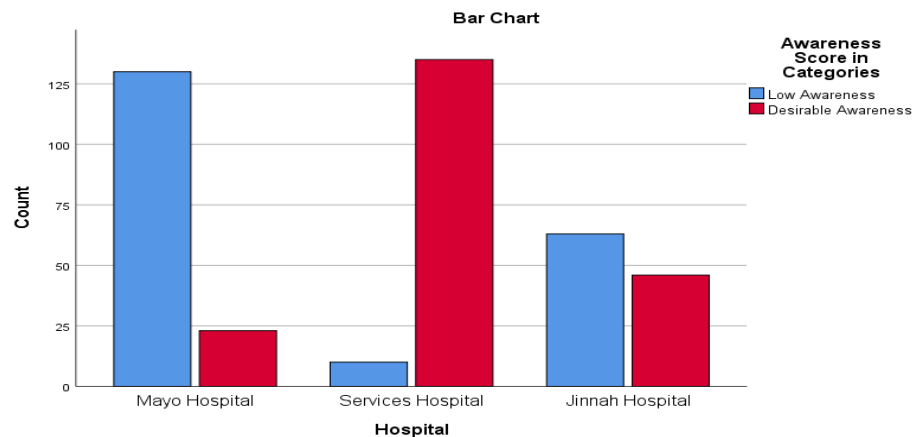


FIGURE 1: Awareness Score according to Hospitals

It is evident from the figure that only Services Hospital has achieved desirable awareness, whereas low awareness is observed in patients of Mayo Hospital.

DISCUSSION:

Viral hepatitis is a major public health problem worldwide. Viruses of Hepatitis A and E are transmitted orally. Hepatitis B, C and G are transmitted parentally, due to injury with contaminated sharp instruments, sharing of needles or by sexual contact and also through perinatal transmission from mother to child.¹²

The current study was aimed to assess the knowledge about viral hepatitis among patients of three different hospitals of Lahore. A total of 407 hepatitis patients were interviewed, majority of them were females (60%), with high Illiteracy rate (56.0%), married (90.7%) and residents of urban areas (79.6%) which is in accordance to a study conducted by Talpur AA in 2007.^{13,14}

All the demographic variables were significantly different among the three hospitals. It was observed that females have more knowledge of viral hepatitis than males which is in accordance to the study conducted by Khuwaja AK in 2002.¹⁴

In current study most of the patients belong to the age group > 40, with mean score of knowledge (20.39±10.33) which is statistically different. This indicates that patients with older age are more likely to be aware of hepatitis.¹⁵

Majority of patients have general information regarding Hepatitis A, B, C but they don't have enough knowledge about Hepatitis D and E. The patients were unaware of the existence of Hepatitis D and E which is very uncommon and they also did not know the difference between acute and chronic hepatitis.³

The reason behind the low knowledge of HEV could be related to the absence of routine checkup, lack of awareness and specific HEV diagnosis by doctors and laboratories.¹⁶

In the study conducted by Taylor VM in 2006, it was reported that 54% of the participants knew that hepatitis can spread during sexual intercourse, blood transfusion, through water or vegetables.^{13, 17,18}

It was reported in current study that 49.1 % patients were aware that there was a vaccination available for Viral Hepatitis and 48.4% people knew that viral hepatitis was curable. These results were similar to the study conducted by Khan N.¹⁹

Knowledge about the complication of hepatitis like liver cirrhosis and liver cancer were low in patients which was not similar to other studies.^{17,18,20}

In the study conducted by Mansour-Ghanaei R in 2013, they reported that patients have desirable knowledge towards the disease, its transmission, symptoms, complications, preventions and treatment but all of these results were not similar with current study.²⁰

The mean knowledge score of viral hepatitis was higher in males than in females (24.87±9.43, 15.82±8.61) which was in accordance to different studies.^{19,20}

In another study conducted by Ahmadi et al. on health care workers' knowledge and attitude towards Hepatitis B, it was observed that majority of health care workers have moderate knowledge and they found that the female health care workers were more knowledgeable about HBV infection than males, which contradicts with the current study.²⁰

The results of this study reported that the graduated patients had desirable knowledge score (91.0%). There was a significant difference between knowledge score among all levels of education (p -value <0.05).^{13,21}

In current study, residents of urban areas had higher mean scores of correct responses in comparison to rural residents, which was similar to a study conducted by Wu E in 2015, which reported that the HCV knowledge of US patients was higher than that of the Chinese patients.

Multivariate analysis depicted that educational level, persons in family, hospital, hepatitis type and residential area played a vital role in explaining the knowledge score (p -value <0.05).⁷

The poor perception of knowledge was observed in Mayo and Jinnah Hospital (13.10+5.23, 15.65+10.45) which is significantly associated with Education Level, Hospital, Hepatitis type Residential area and Persons in home.

CONCLUSIONS:

This study showed a low level of knowledge among patients who are already diagnosed with any type of hepatitis. The chronic hepatitis patients have a higher score of knowledge in comparison to patients of acute hepatitis. Furthermore gender, age, education, income, residential and marital status are significantly associated with knowledge score. Patients from Services Hospital have maximum score among all this which might be due to the guidance and awareness program arranged by their paramedical staff. One-on-one sessions with patients must be conducted for their advocacy and counselling regarding transmission, clinical manifestations, complications and prevention of hepatitis.

LIMITATIONS:

To the best of our knowledge awareness is based on general aspects, risk, diagnosis, symptoms, transmission, complications and prevention. But if there might be some other parameter/s that has been missed out then, this study will be deficient there. The second area where this study will be deficient is that the data has been collected from Punjab region only and specifically from Government sector hospitals, so there might be some difference between public and private sector hospitals.

RECOMMENDATIONS:

If patients were to be guided throughout the hospitalization and medication procedure then awareness might be increased. Or we can say that if we could enhance the literacy rate, then it might work for future.

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