

## Risk Factors Analysis of Gastro- Intestinal Infections among the Patients in Tertiary Care Hospital in Dhaka, Bangladesh

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### ABSTRACT

**Background:** Viral hepatitis is one of the major public health concerns around the world. Every year millions of people die from viral hepatitis-related cirrhosis and liver cancer. However the fact is the majority of the infected populations are unaware of their condition.

**Objective:** The objective of the study was to find out the proportion of the risk factors associated with gastrointestinal infections among the inpatients attending in tertiary care hospital in Dhaka city.

**Materials & Methods:** A cross-sectional study was carried out among the hospital admitted patients at gastroenterology department from January to April, 2019. A total of 193 patients were purposively selected who were above 18 years and diagnosed case of hepatitis, diarrhoeal diseases, enteric fever, H. pylori infection.

**Results:** The outcome of the study was that, majority 82(42.5%) of the patients age was between 21-40 years. Maximum participants were male (65.3%). Study found that among 193 patients, 45 (23.3%) were diagnosed as hepatitis B, 31 (16.1%) were H. pylori infection, 29 (15.0%) diarrhoea, hepatitis C 19 (9.8%), hepatitis E 23 (11.9%) and hepatitis A 21 (10.9%). It also found that mean duration of Gastro-Intestinal (GI) infection was 2.59 ( $\pm$  3.22) years. Water borne diseases like hepatitis A, E, diarrhoea, typhoid and H. pylori infection mostly presents due to 44 (34.4%) patients drunk water from supply water (Dhaka WASA), 73.4% eaten street juice and 79.7% had eaten street food before diagnosed diseases. Commonest risk factors were hepatitis B and C. 37 (56.9%) patients had received blood previously, 11 (17.2%) had their previous history of operation, 42 (64.6%) had visited dentist for dental issues, 29 (44.6%) patients attended endoscopy or colonoscopy test, 28 (43.1%) patients informed that they had

faced minor skin injury when shaving in salon and 6 (9.2%) patients mentioned taken dialysis. According to the findings, 20.3% patients having liver diseases, 5.7% heart diseases, 4.1% respiratory diseases, 7.3% renal diseases, 26.4% diabetic, 22.8% hypertensive, 15.0% anemia and 26.9% smoker Street juice [OR: 95% CI, 4.9%] and Street food [OR: 95% CI, 6.1%] risk of hepatitis A infection. The proportion of risk factors of hepatitis B infection revealed that the patients who received blood previously [OR: 95% CI, 3.14%] has the risk of hepatitis, second hand razor use [OR: 95% CI, 7.76%], Dialysis [OR: 95% CI, 2.47%].

**Conclusion:** Street foods & juice, unpurified water was the commonest factors of hepatitis A & E, typhoid and diarrhea. On the other side, unscreened blood, dental procedure, skin injury in saloon, dialysis and endoscopy/colonoscopy test were the commonest risk of hepatitis B & C virus. H. pylori infection.


**Keywords:** Gastro- Intestinal Infections, Viral Hepatitis, Diarrhoeal Diseases, Enteric Fever, H. Pylori Infection.

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### INTRODUCTION

Hepatitis, enteric fever, H. pylori infection, diarrhoeal diseases are the most common Gastro- intestinal infections. Due to environmental factors in our country these kinds of infections are more common. At present more than 13.80 % of our population is in extreme poverty level. The sanitation system of our country is not up to the mark. Hepatitis is an inflammation of liver, most commonly caused by a viral infection.

There are five main hepatitis viruses, referred to as types A, B, C, D and E. These five types are of greatest concern because of the causes of illness and death as well as potentialities of outbreaks and epidemically spreading capacities. Hepatitis types B and C are in difference due to leads chronic disease in hundred millions of people. These two are most common concern of liver cirrhosis and cancer disease.<sup>1</sup>

Around 10 millions of people are estimated who are unaware of carrying HBV risk in Bangladesh. The World Health Organization (WHO) believes that globally almost 95% of 400 million people are living with hepatitis infections which they may not know. The number of global deaths in 2015 of hepatitis has been estimated at around 1.3 million. This figure are included the death of acute hepatitis and liver cancer or cirrhosis. In developing countries almost 90% children are infected with hepatitis A and E virus before the age of 10 due to poor sanitation facilities and hygienic practices.<sup>2</sup> Hepatitis infection risk is one of the common issues of patient care in our hospitals. It is estimated 5-10% by bacteria, viruses or fungi. Viral hepatitis can transmit due to unaware of patients and health care provider. Sometimes infections may be life threatening such as meningitis caused of the neonates. In spite these, economical & working hours losses are occurred due to prolonged hospital stay.<sup>3</sup> Blood and blood products are the most common vehicle of transmission in healthcare settings.<sup>4</sup> Due to invasive diagnostic and therapeutic procedures, there is a risk of HBV infection increasing to the auxiliary healthcare workers.<sup>5</sup> HCV is spread primarily by direct contact with human blood. The risk factors of HCV are most frequently associated with transfusion of unscreened blood, unsafe injection kits and other iatrogenic health care procedures. The development of diagnostic tests has resulted in a remarkable reduction of HCV infection in many developed countries.<sup>6</sup> Hepatitis B and C is found in blood and in body fluid, including semen and vaginal fluids. The most common ways hepatitis B& C is spread by sexual contact, sharing of injecting equipment & unsterilized or inadequately sterilized. Sharing personal items likes razors, toothbrushes and nail clippers. Hepatitis B is not spread by contaminated food or water. It cannot be spread through casual or social contact like kissing, sneezing, coughing, hugging or eating food prepared by a hepatitis B effected person.<sup>7</sup> Hepatitis A virus is usually transmitted person-to-person through the fecal-oral route or consumption of contaminated food or water. It is self-limited and does not create chronic infection. Most adults with hepatitis A have the symptoms of fatigue, low appetite, stomach pain, nausea and jaundice, which usually resolve within 2 months of infection. Hepatitis E virus (HEV) is shed in the stools of infected persons and enters the human body through the intestine. It is transmitted mainly through contaminated drinking water. Usually the infection is self-limiting and resolves within 2–6 weeks. Diarrhoea is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral and parasitic organisms. Infection is spread through contaminated food or drinking-water or from person-to-person. Diarrhoea can last several days and creates deficiency of water and salt which are essential of life being. In the past, severe dehydration and fluid loss were the main causes of diarrhoeal death. *Helicobacter pylori*, previously known as *Campylobacter pylori*, are a gram negative, microaerophilic bacterium usually found in the stomach. Children who are malnourished or have impaired immunity and people who are living with HIV are at most risk of life-threatening diarrhoea. Now a day other causes such as septic bacterial infections, like *E. coli*, Rota Virus, *Shigella*, etc. are increasing proportionately of all diarrhoea-associated death. It was identified in 1982 by Australian scientists Barry Marshall and Robin Warren, who found its presence in a person with chronic gastritis and gastric ulcers, conditions which not previously believed to have

a microbial cause. It is also linked to the development of duodenal ulcers and stomach cancer. However, more than 80% of individuals infected with the bacterium are asymptomatic and it may play an important role in the natural stomach ecology. More than 50% of the world's population has *H. pylori* in their upper gastrointestinal tracts. Infection is more common in developing countries than Western countries. *H. pylori*'s helical shape (from which the genus name derives) is thought to have evolved to penetrate the mucous lining of the stomach. Enteric fever, also known simply as typhoid, is a bacterial infection due to *Salmonella typhi* that causes symptoms.

Symptoms may vary from mild to severe and usually begin six to thirty days after exposure. Weakness, abdominal pain, constipation, headaches and mild vomiting also commonly occur. Sometimes skin rash also might create. Without treatment, symptoms may last weeks or months. People may carry the bacterium without being affected. The cause is the bacterium *Salmonella Typhi*, also known as *Salmonella enterica* serotype Typhi, growing in the intestines and blood. Typhoid fever is a type of enteric fever, along with fever. Typhoid is spread by eating or drinking food or water contaminated with the feces of an infected person. Symptoms are similar to those of many other infectious diseases. Diagnoses are by either culturing the bacteria or detecting the bacterium's DNA in the blood, stool, or bone marrow. Culturing the bacterium can be difficult. In this case bone marrow testing is the most accurate.

## MATERIALS AND METHODS

A cross-sectional study was carried out among the hospital admitted patients at gastroenterology department of Dhaka Medical College Hospital (DMCH) & Sikdar medical College Hospital in Dhaka from January 2019 to April, 2019.

A total of 193 samples had been taken from both hospitals. The aim of the study was to find out the proportion of the risk factors associated with infections among the inpatients attending at gastroenterology department. The patients who were admitted with diagnosed of hepatitis A, B, C & E, Enteric fever, *H. Pylori*, Diarrhoeal diseases, both male & female above 18 years of age. An interviewer-administered questionnaire was used to collect data. Data were analyzed by using SPSS software (Latest version). Descriptive statistics analysis were done includes frequency, percentage, mean and standard deviation. Appropriate inferential statistics test were (Chi square, odds ratio) were carried out in the study.

## RESULTS

### Socio-Demographic Characteristics of the Participants

Out of all respondents, 82(42.5%) of the patients age were between 21-40 years, 12(6.2%) of were 20 & less than 20 and 26(13.5%) were in 61-80 years old.

Figure-1 shows that maximum of the participants were male (65.3%) and rest of them were female (34.7%).

Regarding educational status of the participants, Majority i.e (24.74%) of the patients were secondary school passed only few (2.1%) of them were illiterate. Study also found that 23.8% were HSC passed and 10.9% were SSC passed. It also revealed that participants completed their graduation was 18.1%.

Regarding occupational status, maximum 60(31.1%) of the patients were in service holders, only 5(2.6%) were retired person.

It also found that, 7.3% were unemployed, 5.2% were students, and 5.7% were farmer. Occupation was housewife 56(29.0%) out of all the participants.

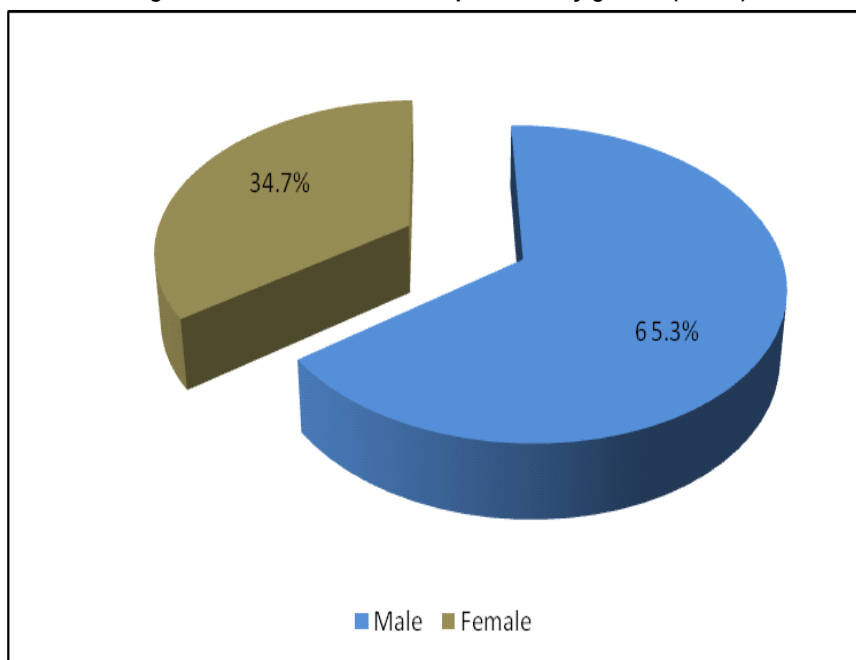
**Table 1: Distribution of the respondents by age (n=193)**

Age	Frequency	%
≤20	12	6.2
21-40	82	42.5
41-60	73	37.8
61-80	26	13.5
Total	193	100.0

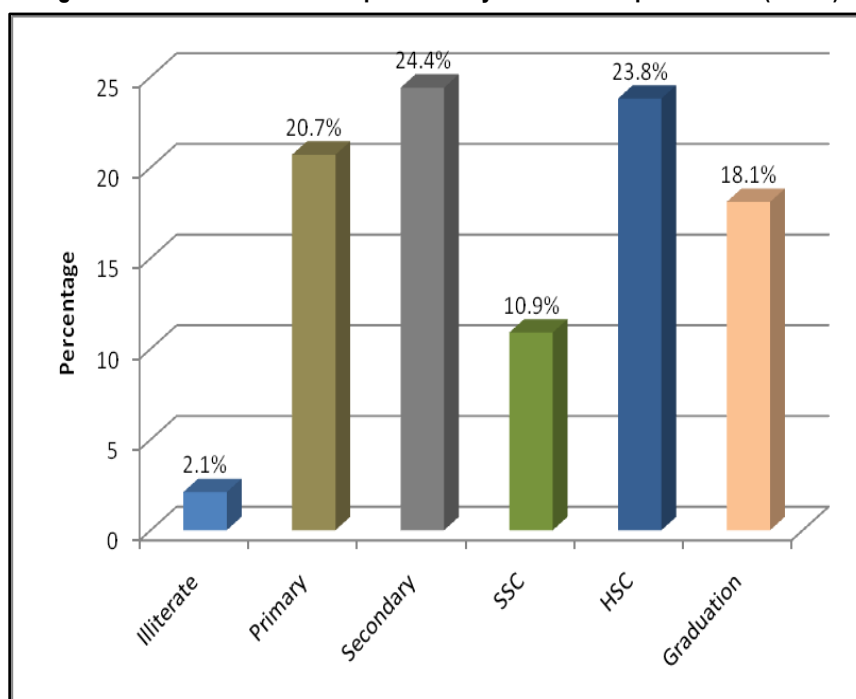
**Table 2: Distribution of the patients by occupation (n=193)**

Occupation	Frequency	%
Unemployed	14	7.3
Service	60	31.1
Business	37	19.2
Student	10	5.2
Retired	5	2.6
Housewife	56	29.0
farmer	11	5.7
Total	193	100.0

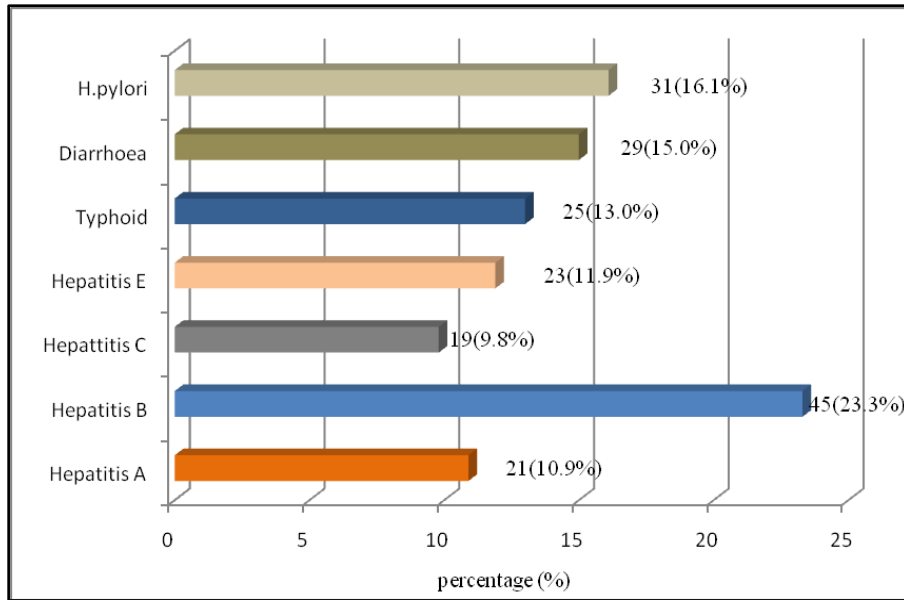
**Figure 1: Distribution of the respondents by gender (n=193)**



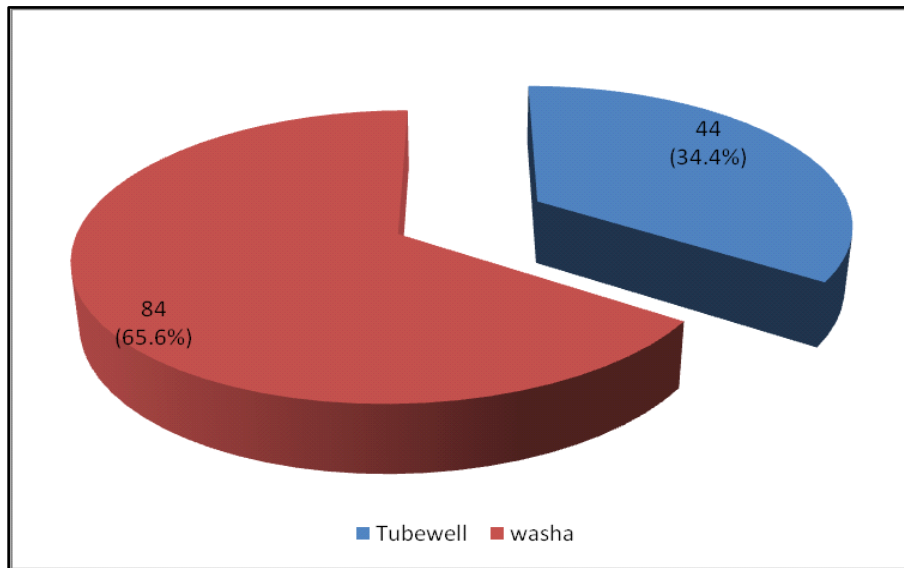
**Figure 2: Distribution of the respondents by educational qualification (n=193)**



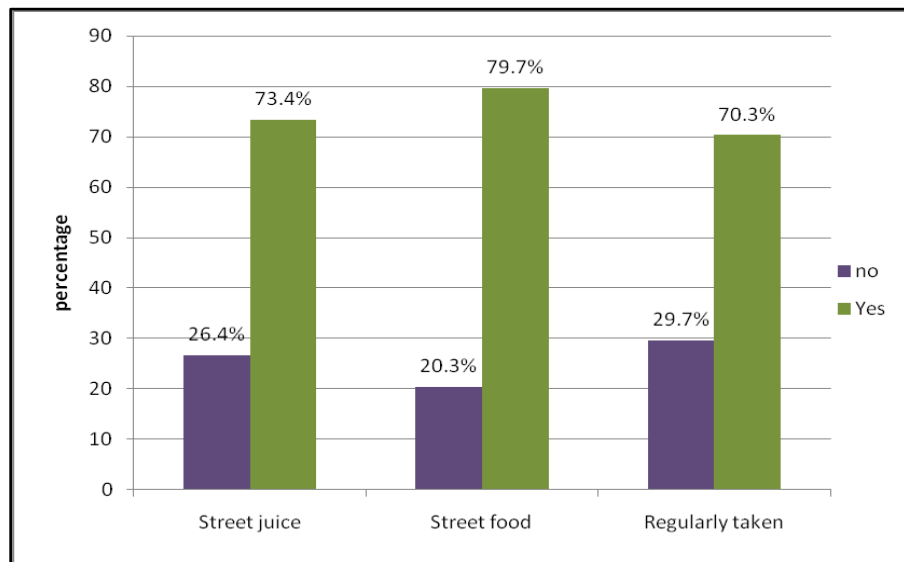
**Figure 3: Distribution of the respondents by type of gastrointestinal infection (n=193)**



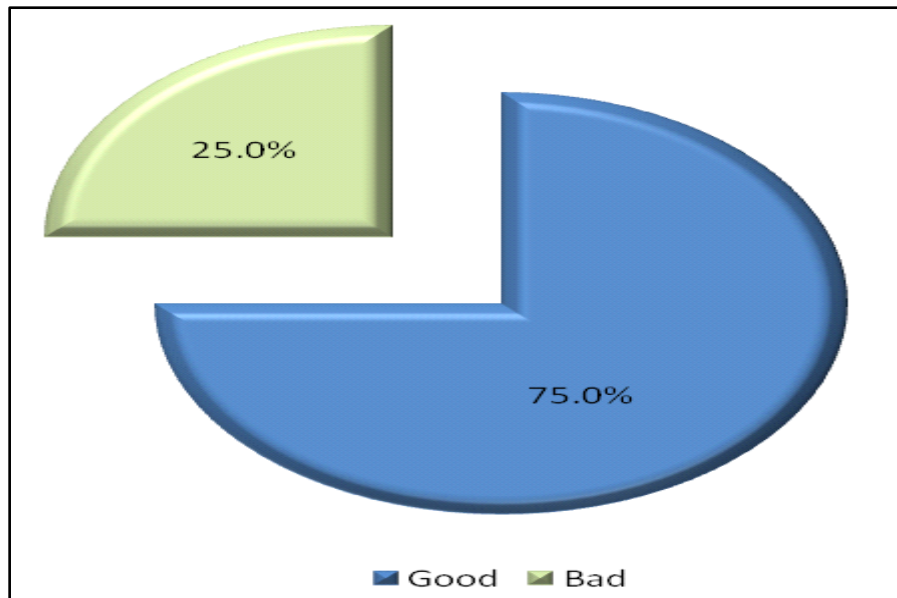
**Figure 4: Distribution of the respondents by source of drinking water (n=193)**



**Figure 5: Distribution of the patients buying habits of street food & juice (n=193)**



**Figure6: Distribution of the patient's sanitation facility(n=193)**



**Table 3: Distribution of the patients by duration of Gastrointestinal infection (n=193)**

Duration of GI infection (years)	Frequency (n)	(%)
≤1 year	107	55.4
1.1-5.0 years	51	26.4
5.1-10.0 Years	35	18.1
<b>Total</b>	<b>193</b>	<b>100.0</b>

Mean (± SD) =2.59(± 3.22) Years, Minimum=1 week  
Maximum=10 Years

**Table 4: Distribution of the patients by purified drinking water (n=193)**

Drink Purified water	Frequency (n)	(%)
Yes	95	47.7
No	98	52.3
<b>Total</b>	<b>193</b>	<b>100.0</b>

**Table 5: Distribution of the patients by history of hand washing (n=193)**

Hand washing	Frequency (n)	(%)
Before meal	33	15.4
After meal	55	32.3
After toilet	105	52.3
<b>Total</b>	<b>193</b>	<b>100.0</b>

**Table 6: Distribution of the patients of blood receiving history (n=65)**

Previously Blood Received	Frequency (n)	(%)
Yes	37	56.9
No	28	43.1
<b>Total</b>	<b>65</b>	<b>100.0</b>

**Table 7: Distribution of the patients by history of invasive procedure (n=65)**

History of invasive procedure	Yes	No	Total
Injection received	50(76.9%)	15(23.1%)	65
Faced Operation before	11(17.2%)	53(82.8%)	
Received Dental treatment	42(64.6%)	23(35.4%)	
Attend Endoscopy/ colonoscopy Test	29(44.6%)	36(55.4%)	

**Table 8: Distribution by any minor accidental injury(n=65)**

History of Accidental injury	Yes	No	Total
Injured by Needle	4(6.2%)	61(93.8%)	65
Injured skin when shaving in saloon	28(43.1%)	37(56.9%)	

**Table 9: Distribution of the patients razor using practice (n=65)**

History of razor used	Frequency (n)	(%)
Unused razor	4	6.2
Used razor	61	93.8
<b>Total</b>	<b>65</b>	<b>100.0</b>

**Table 10: Distribution of the patients history of hepatitis infection (n=65)**

History of Hepatitis	Yes	No	Total
Parents himself	5(7.7%)	60(92.3%)	65
Spouse	14(21.5%)	51(78.5%)	
Hepatitis vaccinated	12(18.5%)	53(81.5%)	

**Table 11: Distribution of the patients of taking dialysis history (n=65)**

Tacking dialysis history	Frequency (n)	(%)
Yes	6	9.2
No	59	90.8
Total	65	100.0

**Risk Factors Associated With Gastrointestinal Infection**

Regarding type of gastrointestinal infection among the admitted patients, majority 45(23.3%) were diagnosed as hepatitis B, 31(16.1%) were H. pylori infection and 29(15.0%) diarrhea patients. It also found that hepatitis C patients were lowest 19(9.8%). Hepatitis E was existing among 23(11.9%), hepatitis A was 21(10.9%).

Considering In GI infection, majority 107(55.4%) of the patients suffered from less than 1 year. 51(26.4%) were suffered between 1.1-5.0 years and 35(18.1%) were 5.1-10 years of GI infection. Average duration was 2.59(± 3.22) years.

Regarding source of drinking water, 84(65.6%) patient’s mentioned tube well and 44(34.4%) from supply line (WASA).

Regarding purified drinking water, 95(47.7%) patient’s drunk water through purification. And 98(52.3.7%) patients did not purify.

Regarding patients buying habits of street food & juice, 73.4% patients had mention street juice and 79.7% street food.

Regarding patients hand washing issue, 33(15.4%) patients mentioned hand washed before meal. Hand wash after toile were higher 105(52.3%).

The patients who were suffering gastrointestinal infection, regarding their sanitation facility 75.0% mentioned good and rest 25.0% mentioned not good enough.

Regarding blood receiving history,37(56.9%) patient had mention yes. 28(43.1%) said no, not received blood during their life time.

Regarding invasive procedure in the past, 50(76.9%) said they received injection and 11(17.2%) faced operation previously. Study also found that 42(64.6%) visited to dentist for dental problem. 29(44.6%) patients attend endoscopy or colonoscopy test previously. Regarding accidental minor injury, 4(6.2%) patients mentioned injured by needle and 28(43.1%) mentioned injured skin while shaving in saloon.

In razor using practice while shaving, 4(6.2%) patients mentioned unused razor and 61(93.8%) used razor.

Regarding hepatitis infection history, 5(7.7%) patients mention faced infection himself, 14(21.5%) mentioned spouse.

Regarding dialysis taking history, only 6(9.2%) patients mentioned yes and 59(90.8%) mentioned no.

Figure 7 showing the distribution of co-morbidities of gastrointestinal infectious of patients. According to the findings, 20.3% patients having liver diseases, 5.7% heart diseases, 4.1% respiratory diseases, 7.3% renal diseases, 26.4% diabetic, 22.8% hypertensive, 15.0% anaemia and 26.9% smoker.

Out of all distribution, 10(21.3%) patients washed their hand before meal and 11(13.6%) did not. Statistically there is no significant relationship between hand washing before meal and hepatitis A infection ( $\chi^2=1.285$ ,  $p>0.05$ ). And 95% confidence interval there was 1.72% risk of hepatitis A infection. Hand washing after meal was 1.69% risk of developing hepatitis A infection. Study also found the factors of cleaning the hand after toilet 1.84%, boiling of water 2.04%, and Street juice 4.9% and Street food 6.1% risk of hepatitis A infection. Table 13 shows the proportion of risk factors of hepatitis B infection; out of all distribution the patients who took blood previously he has the 3.14% risk of hepatitis. It also found that dental visit 2.0%, skin cut in salon 1.38%, second hand razor use 7.76%, Dialysis 2.47%.

Study shows that, blood taken before has 2.12% risk of hepatitis C virus infection. It also found that skin cut salon 4.02%, endoscopy or colonoscopy was 1.17% risk of Hepatitis c infection.

Factors of hepatitis E infection with 95% CI, hand washing before meal(0.3%), hand washing after meal (0.3%), source of drinking water (2.13%), Boiling of drinking water, Juice from street (1.27%) street food (2.58%).

Proportion of risk of typhoid infection among the gastrointestinal patients who washed their hand before meal 1.3%, source of drinking water 3.4%, boiling of water 1.56% and street food 2.22% Study also shows that, proportion of risk of diarrhea in case of hand washing practice before meal 1.7%, clean hand after toilet 6.2%, source of drinking water 0.5%, boiling water 2.5%, and sanitation facility 2.8% In case of H. pylori, proportion of risk factors with 95% CI, the patients who clean hand after toilet was 0.7%, source of drinking water 2.5% and sanitation facility 4.7%.

**Figure 7: Distribution of the respondents by co-morbidities (n=65)**

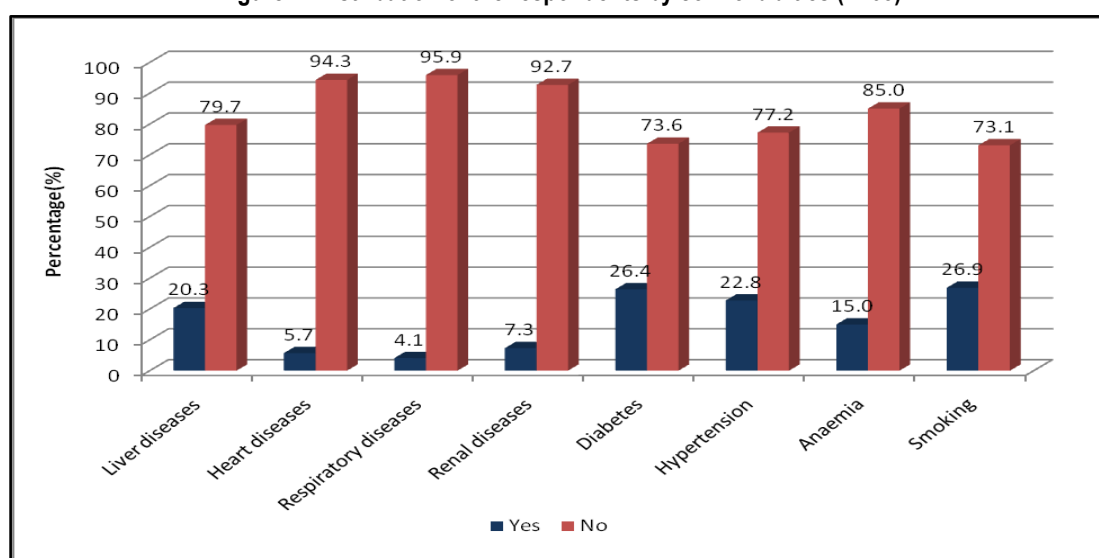


Table 12: Distribution of proportion of risk factors in hepatitis A patients (n=128)

Factors of HAV infection		Hepatitis A			Chi-square test
		Yes	No	Total	
Hand washing before meal	Yes	10(21.3)	37(78.7)	47(100%)	$\chi^2=1.285$
	No	11(13.6)	70(86.3)	81(100%)	p=0.257
Hand washing after meal	Yes	14(19.4)	58(80.6)	72(100%)	$\chi^2=1.108$
	No	7(12.5)	49(87.5)	56(100%)	p=0.293
Clean hand after toilet	Yes	20(16.9)	98(83.1)	118(100%)	$\chi^2=0.325$
	No	1(10.0)	9(90.0)	10(100%)	p=0.698
Used boiled water	Yes	14(20.9)	53(79.1)	67(100%)	$\chi^2=2.067$
	No	7(11.5)	54(88.5)	61(100%)	p=0.162
Having street Juice habits	Yes	15(16.0)	79(84.0)	94(100%)	$\chi^2=5.02$
	No	6(17.6)	28(82.4)	34(100%)	p =0.023
Having street Food habits	Yes	20(19.6)	82(80.4)	102(100%)	$\chi^2=3.75$
	No	1(3.8)	25(96.2)	26(100)	p =0.043

Table 13: Distribution of proportion of risk factors in hepatitis B patients (n=65)

Factors of HBV infection		Hepatitis B			Chi-square test
		Yes	No	Total	
Blood received previously	Yes	22(59.5)	15(40.5)	37(100)	$\chi^2=3.850$
	No	23(82.1)	5(17.9)	28(100)	p=0.050
Visited Dentist	Yes	27(64.3)	15(35.7)	42(100)	$\chi^2=1.363$
	No	18(78.3)	5(21.7)	23(100)	p=0.243
Minor skin injury in saloon while shaving	Yes	23(82.1)	5(17.9)	28(100)	$\chi^2=3.850$
	No	22(59.5)	15(40.5)	37(100)	p=0.50
Using practice of type of razor while shaving	New	1(25.0)	3(75.0)	4(100)	$\chi^2=3.915$
	Used	44(72.1)	17(27.9)	61(100)	p=0.048
Taking Dialysis	Yes	3(50.0)	3(50.0)	6(100)	$\chi^2=1.148$
	No	42(71.2)	17(28.8)	59(100)	p=0.301

Table 14: Distribution of proportion of risk factors in hepatitis C patients (n=65)

Factors of HCV infection		Hepatitis C			Chi-square test
		Yes	No	Total	
Blood received previously	Yes	14(37.8)	23(62.2)	37(100)	$\chi^2=3.076$
	No	5(17.9)	23(82.1)	28(100)	p=0.079
Minor skin injury in saloon while shaving	Yes	4(14.3)	24(85.7)	28(100)	$\chi^2=5.311$
	No	15(40.5)	22(59.5)	37(100)	p=0.021
Attend Endoscopy /colonoscopy test	Yes	9(31.0)	20(69.0)	29(100)	$\chi^2=0.082$
	No	10(27.8)	26(72.2)	36(100)	p=0.774

Table 15: Distribution of proportion of risk of hepatitis E infection (n=128)

Factors of HEV infection		Hepatitis E			Chi-square test
		Yes	No	Total	
Hand washing before meal	Yes	14(29.8)	33(70.2)	47(100)	$\chi^2=7.038$
	No	9(11.1)	72(88.9)	81(100)	p=0.008
Hand washing after meal	Yes	18(25.0)	54(75.0)	72(100)	$\chi^2=5.520$
	No	5(8.9)	51(91.1)	56(100)	p=0.019
Source of drinking water	Tube well	5(11.4)	39(88.6)	44(100)	$\chi^2=1.984$
	Supply water	18(21.4)	66(78.6)	84(100)	p=0.159
Having street Juice habits	Yes	16(17.0)	78(83.0)	94(100)	$\chi^2=0.216$
	No	7(20.6)	27(79.4)	34(100)	p=0.642
Having street Food habits	No	22(71.0)	9(29.0)	31(100)	
	Yes	15(14.7)	87(85.3)	102(100)	$\chi^2=3.627$
	No	8(30.8)	18(69.2)	26(100)	p=0.057

Table16: Distribution of proportion of risk of typhoid infection (n=128)

Factors of Typhoid infection		Typhoid			Chi-square test
		Yes	No	Total	
Hand washing before meal	Yes	8(17.0)	39(83.0)	47(100)	$\chi^2=0.298$
	No	17(21.0)	64(79.0)	81(100)	$p=0.585$
Source of drinking water	Tube well	13(29.5)	31(70.5)	44(100)	$\chi^2=7.278$
	Supply water	12(14.3)	72(85.7)	84(100)	$p=0.039$
Used boiled water	Yes	10(14.9)	57(85.1)	67(100)	$\chi^2=1.898$
	No	15(24.6)	46(75.4)	61(100)	$p=0.168$
Having street Food habits	Yes	17(16.7)	85(83.3)	102(100)	$\chi^2=2.622$
	No	8(30.8)	18(69.2)	26(100)	$p=0.163$

Table 17: Distribution of proportion of risk of diarrhoeal infection (n=128)

Factors of diarrhea infection		Diarrhoea			Chi-square test
		Yes	No	Total	
Hand washing before meal	Yes	8(17.0)	39(83.0)	47(100)	$\chi^2=1.346$
	No	21(25.9)	60(74.1)	81(100)	$p=0.280$
Clean hand after toilet	Yes	23(19.5)	95(80.5)	118(100)	$\chi^2=8.633$
	No	6(60.0)	4(40.0)	10(100)	$p=0.003$
Source of drinking water	Tubewell	14(31.8)	30(68.2)	44(100)	$\chi^2=3.212$
	Supply water	15(17.9)	69(82.1)	84(100)	$p=0.073$
Used boiled water	Yes	10(14.9)	57(85.1)	67(100)	$\chi^2=4.795$
	No	19(31.1)	42(68.9)	61(100)	$p=0.029$
Sanitation facility	Good	17(17.7)	79(82.3)	96(100)	$\chi^2=5.365$
	Bad	12(37.5)	20(62.5)	32(100)	$p=0.021$

Table 18: Distribution of proportion of risk of H. pylori infection (n=128)

Factors infection		H. Pylori			Chi-square test
		Yes	No	Total	
Clean hand after toilet	Yes	30(25.4)	88(74.6)	118(100)	$\chi^2=3.321$
	No	0(0.0)	10(100)	10(100)	$p=0.068$
Source of drinking water	Tubewell	6(13.6)	38(86.4)	44(100)	$\chi^2=3.589$
	Supply water	24(28.6)	60(71.4)	84(100)	$p=0.058$
Sanitation facility	Good	28(29.2)	68(70.8)	96(100)	$\chi^2=7.024$
	Bad	2(6.3)	30(93.8)	32(100)	$p=0.008$

## DISCUSSION

Present study found that, 82(42.5%) of the patients age were between 21-40 years and 12(6.2%) of the patients were 20 or less than and 20 years. Maximum participants were male (65.3%) and rest of them were female (34.7%). Regarding educational qualification, 24.74% of the patients were secondary school passed and only few (2.1%) of them were illiterate. This study also found that maximum 60(31.1%) of the patients were job holder only 5(2.6%) were retired person. In this study, 45(23.3%) were diagnosed as hepatitis B. In another study it was found 10%. The variation depends on time, place and subject.<sup>8</sup> According to the study 31(16.1%) were found H. pylori infection while another study conducted in Saudia Arabia H. pylori in Jazan Province was 46.5%.<sup>9</sup> 29(15.0%) patients were found diarrhoeal disease. While in a study it was 28%.<sup>10</sup> It also found that hepatitis C patients were lowest 19(9.8%). In another study found that 397 (8.4%) were HCV-antibody positive.<sup>11</sup> Hepatitis E was 23(11.9%), hepatitis A 21(10.9%) among inpatients of the gastrointestinal department. Present study found that 107(55.4%) of the gastrointestinal infectious patients suffered from less than 1 year. mean duration was 2.59 ( $\pm$  3.22) years among the admitted patients. Most of

them were hepatitis B and hepatitis C and some were undiagnosed so they suffered for long duration. Study found that, 47(36.7%) patients washed their hand before meal. It also found that 72(56.3%) patients washed their hand after meal. Hand wash practice were higher 118(92.2%) after toilet. In this study commonly 84(65.6%) patient's drunk water from tube well and 44(34.4%) patients drunk from supply water (Dhaka WASA). 67(52.3%) patient's drunk water through purification. Surprisingly 73.4% gastrointestinal infectious patients had eaten street juice and 79.7% had eaten street food before diagnosed diseases. The patients who suffering from gastrointestinal infection their sanitation facility was good it was 75.0% and 25.0% mentioned not using hygienic sanitation facilities. Regarding blood receiving history, 37(56.9%) patients had received blood previously. And 28(43.1%) did not received blood during their life time. Regarding invasive procedure, 50(76.9%) said they received injection and 11(17.2%) mentioned the history of their operation previously. Study also found that 42(64.6%) had visited dentist for dental problem. Endoscopy or colonoscopy history revealed that 29(44.6%) patients attend endoscopy or colonoscopy test.



Gastrointestinal infectious patients 4(6.2%) were injured through needle and 28(43.1%) patients informed to face minor injury while shaving in saloon. A few number of patients 4(6.2%) mentioned not to use new razor while shaving. Regarding hepatitis history, 60(92.3%) patients had no parent's history of hepatitis and only 5(7.7%) had parents hepatitis. It also found that 14(21.5%) patients had husband/wife hepatitis. However, 12 (18.5%) patients mentioned vaccinated for hepatitis previously. Regarding to dialysis history, only 6(9.2%) patients having history of dialysis and 59(90.8%) mentioned no. Gastrointestinal infection involved hepatitis A, B, C, E, diarrhea typhoid and H. pylori which were commonly found among middle aged and comparatively male were higher in number. Source of drinking water, street food and street juice were the high proportionate to risk of hepatitis A & E, diarrhoea and typhoid fever. On the other hand blood receiving history without screen, any surgery, dental checkup, minor skin injury in saloon, and dialysis were more prone to develop hepatitis B & hepatitis C. Gastrointestinal infection patients were co-morbid to Liver diseases, diabetes, and hypertension. According to the study nearly one third of them were found as smoker.

## CONCLUSION

Gastrointestinal infection involved hepatitis A, B, C, E, diarrhea typhoid and H. pylori which were commonly found among middle aged people and comparatively male was higher in number. Source of drinking water, street food and street juice were the high proportionate to risk of hepatitis A & E, diarrhoea and typhoid fever. On the other hand blood receiving history without screen, any surgery, dental checkup, skin injury in saloon and dialysis were more prone to develop hepatitis B & hepatitis C. In this study there was some co-morbidity of gastrointestinal infectious patients. According to findings, 20.3% patients having liver diseases, 5.7% heart diseases, 4.1% respiratory diseases, 7.3% renal diseases, 26.4% diabetic, 22.8% hypertensive, 15.0% anaemia and 26.9% smoker. Increasing co-morbidities in chronic hepatitis B patients: experience in primary care and referral practices during 2000–2015 found that between 2000–2005 and 2011–2015, fatty liver disease among new CHB patients increased from 1.6 to 6.8% ( $p < 0.001$ ). Advanced liver diseases also increased ( $p < 0.001$ ): cirrhosis (12.6–24.6%), hepatic decompensation (1.1–7.9%), and hepatocellular carcinoma (HCC) (4.9–9.1%). Similar trends were observed for non-liver co-morbidities ( $p < 0.001$ ). Specifically, diabetes increased almost fivefold (4.9–22.9%), hypertension increased threefold (12.3–36.1%) and chronic kidney disease increased 4.5-fold (4.4–19.7%).<sup>12</sup>

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