

# A Study on Case Fatality of COVID-19 Patients with Ischemic Heart Disease in Selected Hospitals in Dhaka City

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## Abstract

**Objective:** To identify the significant level of Case fatality of Covid-19 Patients with Ischemic Heart Disease in selected hospitals in Dhaka city. **Method:** This cross sectional study was carried out at NICVD/ Lab aid cardiac hospital/ Universal cardiac hospital from January 2023 to February 2023. Where a total of 384 adults (>18 ages) with Ischemic Heart Disease who admitted in hospital and tested positive for Covid- 19 were included as a sample population. After collecting data from sample population, data was checked and re-checked for completeness and correctness. The Collected data was analyze via statistical Software's like STATA, SPSS etc. **Results:** during the study, majority were belonging to 51-60 years age group, 32.81%. followed by 27.60% were belong to 41-50 years age group and 23.18% belong to >61 years age group and majority were male, 80%. 42.71% had normal weight whereas 28.13% were overweight & 24.74% were obese. 80.47% had chest pain, followed by 13.28% had dyspnea, 12.50% had cough, 10.68% had palpitation, 4.17% had vomiting. where 46.61% had STEMI, followed by 17.19% had NSTEMI, 19.27% had unstable angina, 25.78% had systemic hypertension, 21.88% had diabetes mellites, 6.77% had Heart valve disease, 4.43% had Arrhythmia. Plus, majority didn't get their vaccination, 89.60%. 49.48% had abnormal level of anxiety status whereas 55.73% had abnormal level of depression. Multivariable logistic regression found residence, age, profession, and income to be statistically significantly associated with anxiety after controlling for the other factors found to be significant at the univariate level. Plus, Chronic disease, STEMI, NSTEMI to be statistically significantly associated with anxiety after controlling for the other factors found to be significant at the univariate level. Cardiovascular Drug Therapy at Hospitalization of Covid-19 shows Medical therapy included ACE inhibitors (22.1% of the patients), ARBs (20.57%). mean length of hospital stay was 10.7±2.7 days, with an overall in-hospital mortality of 5.8% (515 of 8910 patients) in this population of patients with completed outcomes. **Conclusion:** Our findings indicate that health care providers, particularly cardiologists and nurses, should take extra care to detect and evaluate all heart disease patients for level of anxiety and depression in a clinical setting. There is a need to develop a quick screening approach in hospitals dealing with cardiovascular inpatients to identify those needing extra evaluation and care.

**Keywords:** Case fatality, Covid-19 Patients, Ischemic Heart Disease.

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## INTRODUCTION

Coronavirus disease (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a major threat to global health including Bangladesh. Since, its recognition in Wuhan, China in December 2019, COVID-19, has rapidly spread throughout the world and become a pandemic [1]. It has been documented more than 80% of affected people

remain asymptomatic and can be treated symptomatically at home isolation, with recommended mandatory uses of Mask, safe distancing of about 6 feet and 20 seconds hand washing before or after touching any surfaces which might have contaminated with corona virus. Only, 20% of Covid-19 positive patient may need hospitalization and 3%-4% may need ICU care with or without ventilation support. High flow Nasal cannula has proven effective alternative to ventilation.

Bangladesh, a densely populated country over 17 crore people. Many are living below standard of basic needs and lives on daily income. Within the available resources, and very low number COVID19 test, already it is difficult to assess the exact scenario of number of affected people, disease spread, and death from it. Preparedness to dealt it at very early stage and effective home or institutional isolation, lack of concerned institutional common consensus in preventing the spread and treating facilities with high flow nasal cannula (HFNC) and ICU back up with trained manpower, put us vulnerable to Covid19 infection, with subsequent life-threatening complications and possible long duration. It has been well documented that in the west, old age people, male sex, with multiple comorbid are in great risk with highest mortality in this subset of patient. Among those, who had COVID-19 diagnosis by RT-PCR, more than 14 million peoples infected by COVID-19 and more than 6.2 lac died.

Many remain undiagnosed and died at home with the symptoms of corona. Currently, there is no evidence from randomized clinical trials (RCTs) that any potential therapy improves outcomes in patients with either suspected or confirmed COVID-19. There is no clinical trial data supporting any prophylactic therapy as well [2]. In Bangladesh, the number of acute cardiovascular condition dramatically fall in most of the hospitals. The infection caused by severe acute respiratory syndrome coronavirus-2, COVID-19, can result in myocardial injury, heart failure and arrhythmias. Therapies for COVID-19 has many adverse cardiac effects. In Wuhan, two recent papers found higher troponin level in 27.8% and 19.7% of patients, and were older age, had higher rates of comorbid conditions including hypertension, coronary artery disease, history of cardiomyopathy, chronic obstructive pulmonary disease [3, 4]. ACC/AHA/ESC published guidelines in treating ST segment Elevated Myocardial Infarction (STEMI) patients along with other life-threatening cardiac conditions. For, acute ST elevated myocardial infarction, they recommended initially, pharmacoinvasive therapy. Where, Patient will be thrombolysed and later, to Rescue or elective PCI. Some recommended for Primary PCI if there is Corvid-19 dedicated Cardiac catheterization lab available [5, 6]. In Bangladesh, most of the center has only one Cath lab and it's not possible to treat STEMI patient in this global pandemic, where chances of possible infection to non-COVID-19 patient. Since, like west, we do not have separate block or facilities to treat only COVID-19 patient. Therefore, we started at our center pharmacoinvasive therapy, initially thrombolysis by STK or TNK in grey zone of our CCU, send COVID-19 test, if positive then to treat him conservatively and wait till his COVID-19 become negative, to perform coronary angiogram with or without required intervention or CABG. It has already shown in various research on modifiable risk factors that potentially increased susceptibility to infection or worst outcomes among patient with cardiac

disease, CKD, Diabetes Mellitus [7, 8]. It has been well established that the SARS-Cov-2, a single stranded RNA-enveloped virus, targets cell through the Spike protein of COVID-19 binds ACE2 receptors in Lung Alveoli and then enter into cell, where replicate to several thousand virus [9]. Also, through its binding affinity with ACE2 receptor, COVID-19 binds heart, kidney, and vascular system. Several has hypothesized, that Angiotensin Converting Enzymes inhibitor (ACEIs)/ angiotensin receptor blockers (ARBs) may make patients more susceptible to COVID-19 and to worse outcomes through upregulation of the functional receptor of the virus ACE2 [10-12]. Therefore, whether to discontinue or add the drugs, several has emphasized that the available data do not support discontinuation or addition of ACEI/ ARB [13, 14]. In a high-risk population of older patients with cardiovascular disease, randomization to ramipril had no impact on the incidence or severity of COVID-19 and support the maintenance of RAAS inhibitor treatment during COVID-19 crisis [15]. These viral lifecycle steps provide potential targets for drug therapy from binding to spike proteins to cell entry, synthesizes RNA via RNA dependent RNA polymerase and finally release of viral particles [16]. At present, absence of proven therapy for SARS-CoV-2, the cornerstone of care for patient COVID-19 remains supportive care, ranging from symptomatic OPD management to full intensive care support. However, 3 adjunctive therapies that warrant special mention are corticosteroids, anticytokine or immunomodulatory agent, and immunoglobulin therapy. The rationale for the use of corticosteroids is to decrease the host inflammatory response in the lungs, which may lead to acute lung injury and acute respiratory distress syndrome (ARDS) [17, 18].

## OBJECTIVE

- To identify the significant level of Case fatality of Covid-19 Patients with Ischemic Heart Disease in selected hospitals in Dhaka city.

## METHODOLOGY

**Study Design:** The method of the study was Descriptive cross-sectional study.

**Study Site & Area:** NICVD/ Lab aid cardiac hospital/ Universal cardiac hospital was the site of data collection.

**Sample Population:** All adults (>18 ages) with Ischemic Heart Disease who admitted in hospital and tested positive for Covid- 19.

**Study Period:** Data was collect from January 2023 to February 2023

**Sample Size:** Since it is a cross-sectional study, we used the following formula.

$$n = \frac{Z\alpha^2 p(1-P)}{d^2}$$

$$n = \frac{(1.96)^2 (0.5) (1-0.5)}{(0.05)^2}$$

$$n = 384$$

Where,  
 n = Desired sample size  
 Zα = Level of statistical significance (1.96) q = 1-p = (0.50)  
 P = Proportion of case fatality rate (0.50) d = Marginal error (0.05)

**Inclusion Criteria:**

Following criteria will be followed to include in the study.

- Bangladeshi citizens only.
- Adults, (Age >18 years).
- Those who tested positive for Covid-19.
- Those with admission diagnosis of Angina, Pneumonia, Cough and Difficulty breathing.

**Exclusion criteria:**

- Children, (Age <18 years).
- Pregnant women.
- Unwillingness to participate in the research project.

**Sampling Technique:** Convenient sampling technique used to collect the data.

**Data Collection Tools:** Secondary data collection

method used here to collect data. Data will collected from selected hospital’s patient record files.

**Data Management and Analysis Plan:**

- After collecting data from sample population, data was checked and re-checked for completeness and correctness.
- The Collected data was analyze via statistical Software’s like STATA, SPSS etc.
- Then data was double-checked for accuracy.
- Descriptive statistics were performed for socio-demographic variables.
- The proper statistical analysis, such as frequency distribution and chi square analysis, will be performed in order to correlate variables with the research’s objective.

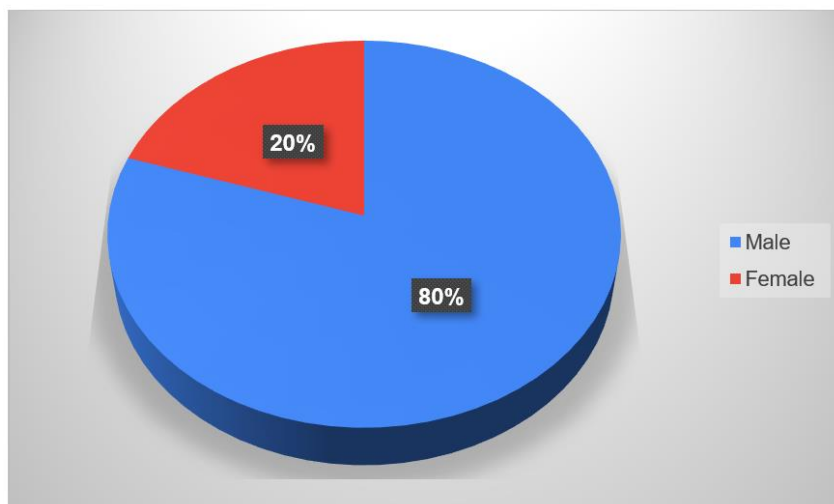
**RESULTS**

Table-1 shows Age distribution of the patients where majority were belonging to 51-60 years age group, 32.81%. followed by 27.60% were belong to 41-50 years age group and 23.18% belong to >61 years age group.

**Table 1: Age distribution of the patients**

Age group	N	%
Up to 40 years	63	16.41
41–50 years	106	27.60
51–60 years	126	32.81
61 to above years	89	23.18

Figure-1 shows gender distribution of the patients, where majority were male, 80%.



**Figure 1: Gender distribution**

Table-2 shows demographic status of the patients. Most participants were married (96.6%), with

27.4% in the business profession. 30% of patients had no income and 36.6% had only education of up to class five.

**Table 2: Demographic status of the patients**

<b>Religion</b>	<b>N</b>	<b>%</b>
Muslim	350	91.15
Hindu	31	8.07
Others	03	0.78
<b>Residence</b>		
Urban	159	41.41
Rural	179	46.61
Semi-rural	46	11.98
<b>Income</b>		
Monthly income	<b>N</b>	<b>%</b>
1-<10,000 taka	73	19.01
10,000–20,000 taka	93	24.22
20,001–50,000 taka	85	22.14
>50,000 taka	17	4.43
No income	116	30.21
<b>Marital status</b>		
Married	371	96.61
Unmarried	12	3.13
Divorced/widow	01	0.26
<b>Occupation</b>		
Unemployment	52	13.54
Government job	11	2.86
Private job	94	24.48
Businessman	105	27.34
Farmer	47	12.24
Retired	33	8.59
Housewife	42	10.94
<b>Education</b>		
No formal education	44	11.46
Class 1–5	140	36.46
Class 6–10	125	32.55
Class 11–12	43	11.20
Graduation	26	6.77
Post-graduation	06	1.56

Figure-2 shows BMI status of the patients where 42.71% had normal weight whereas 28.13% were overweight & 24.74% were obese.

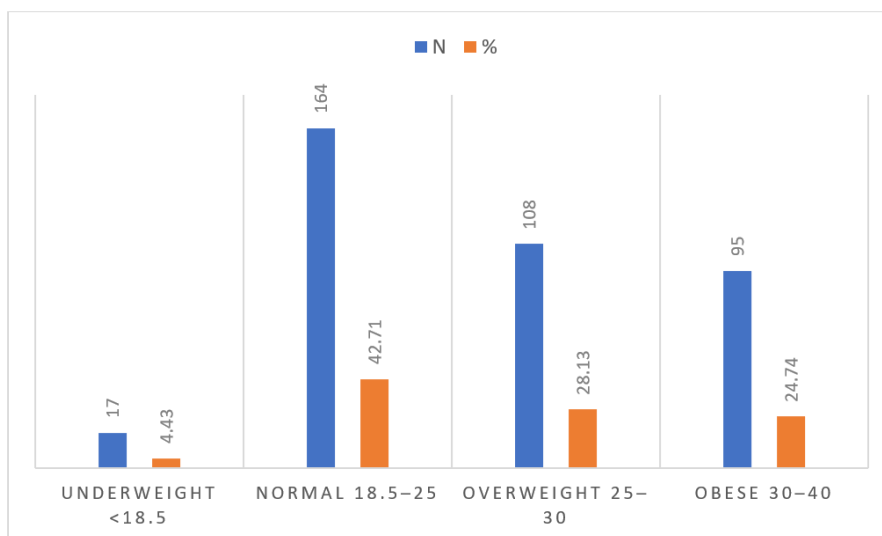
**Figure 2: BMI status of the patients**

Table-3 shows symptoms of the patients where 80.47% had chest pain, followed by 13.28% had

dyspnea, 12.50% had cough, 10.68% had palpitation, 4.17% had vomiting.

**Table 3: Symptoms of the patients**

Symptoms	N	%
Chest pain	309	80.47
Dyspnea	51	13.28
Cough	48	12.50
Palpitation	41	10.68
Edema	15	3.91
Orthopnea	12	3.13
Vomiting	16	4.17
Insomnia	24	6.25
No	46	11.98

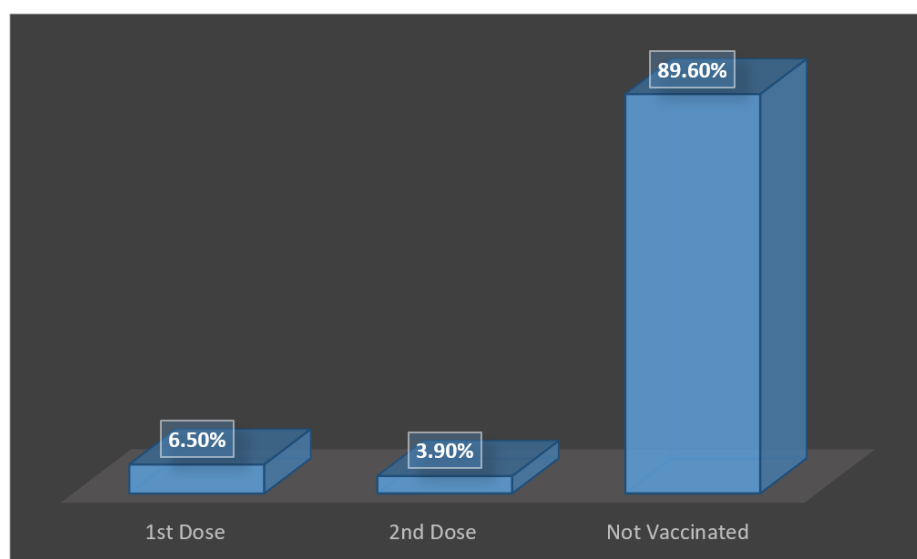
Table-4 shows clinical diagnosis status of the patients where 46.61% had STEMI, followed by 17.19% had NSTEMI, 19.27% had unstable angina, 25.78% had

systemic hypertension, 21.88% had diabetes mellites, 6.77% had Heart valve disease, 4.43% had Arrhythmia.

**Table 4: Clinical diagnosis status of the patients**

Clinical diagnosis	N	%
STEMI	179	46.61
NSTEMI	66	17.19
Old MI	71	18.49
RMI	15	3.91
Unstable angina	74	19.27
Stable angina	11	2.86
Systemic hypertension	99	25.78
Diabetes mellitus	84	21.88
ALVF	59	15.36
Complete heart block	15	3.91
H/O PCI	17	4.43
H/O CABG	07	1.82
Heart valve disease	26	6.77
Arrhythmia	17	4.43

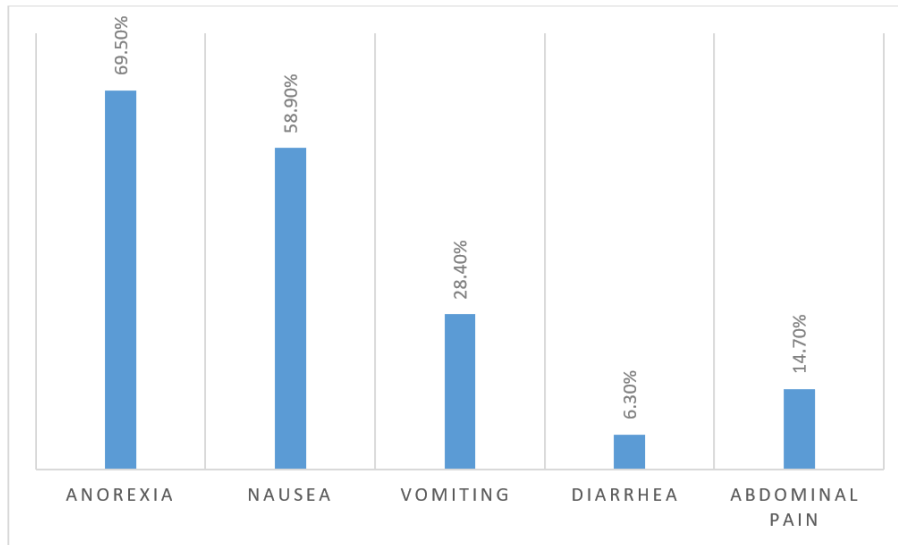
Figure-3 shows vaccination status of the patients where majority didn't get their vaccination, 89.60%.



**Figure 3: Vaccination status of the patients**

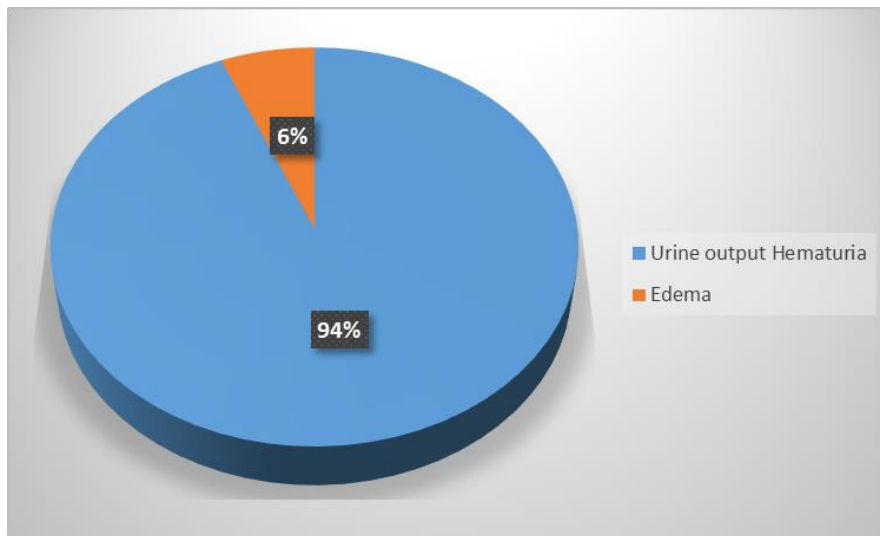
Figure-4 shows GIT symptoms of the patients where 69.5% had anorexia followed by 58.9% had

nausea, 28.4% had vomiting, 14.7% had Abdominal pain.



**Figure 4: GIT symptoms of the patients**  
\*multiple responses were noted.

Figure-5 shows urine status of the patients where 94% had urine output hematuria.



**Figure 5: Urine status of the patients**

Table-5 shows laboratory profile of the patients where on laboratory investigations, we found most of the

patients had elevated levels of C-reactive protein and D-dimer was positive in 99% cases.

**Table 5: Laboratory profile of the patients**

Patient characteristics (reported sample size)	All patients
	%
X-ray finding suggestive of pneumonia	
Absent	60.95
Present	39.05
Creatinine level (mg/dL)	
Abnormal: >1.2	20.54
Normal: ≤1.2	79.46
SGPT level (U/L)	
Abnormal: >40	58.54

Normal: $\leq 40$	41.46
C reactive protein test (mg/L)	
Abnormal: $\geq 6$	36.89
Normal: $< 6$	63.11
D-dimer level (ng/mL)	
Abnormal: $> 500$	99
Normal: $\leq 500$	1
Blood haemoglobin level (g/L)	
Abnormal: $< 100$	32.18
Normal: $\geq 100$	67.82
WBC total count ( $\mu\text{L}$ )	
Abnormal: $< 4000$	2.53
Normal: $\geq 4000$ and $< 11\ 000$	97.47
Neutrophil: lymphocyte ratio	
Abnormal: $> 3.5$	29.07
Normal: $\leq 3.5$	70.93
Monocytes differential count (%)	
Abnormal: $> 8$	25.58
Normal: 2–8	74.42
Eosinophil differential count (%)	
Abnormal: $> 4$	9.30
Normal: 1–4	90.70
Platelet level ( $\times 10^9/\text{L}$ )	
Abnormal: $< 150$	9.86
Normal: $\geq 150$	90.14
High LDH	25.5%
High Ferretin (ng/ml)	36.7%

Table-5 shows behavioral status of the patients where 49.48% had abnormal level of anxiety status whereas 55.73% had abnormal level of depression.

**Table 5: Behavioral status of the patients**

Anxiety level	N	%
Normal	102	26.56
Borderline abnormal	92	23.96
Abnormal	190	49.48
Depression level	N	%
Normal	119	30.99
Borderline abnormal	214	55.73
Abnormal	51	13.28
Normal	102	26.56

Table-6a shows association between anxiety and depression level of patients with different variables where Multivariable logistic regression found residence, age, profession, and income to be statistically

significantly associated with anxiety after controlling for the other factors found to be significant at the univariate level.

**Table 6a: Association between anxiety and depression level of patients with different variables**

Variables	Category	Anxiety				Depression			
		Normal	Borderline abnormal	Abnormal	<i>p</i>	Normal	Borderline abnormal	Abnormal	<i>p</i>
Gender	Female	18 (40.00)	11 (24.44)	16 (35.56)	0.065	8 (17.78)	35 (77.78)	2 (4.44)	0.006
	Male	84 (24.78)	81 (23.89)	174 (51.33)		111 (32.74)	179 (52.80)	49 (14.45)	
Age	Up to 40	17 (26.98)	16 (25.40)	30 (47.62)	0.207	26 (41.27)	27 (42.86)	10 (15.87)	0.000*
	41–50	31 (29.25)	17 (16.04)	58 (54.72)		40 (37.74)	41 (38.68)	25 (23.58)	
	51–60	27 (21.43)	33 (26.19)	66 (52.38)		34 (26.98)	82 (65.08)	10 (7.94)	
	61 to above	27 (30.34)	26 (29.21)	36 (40.45)		19 (21.35)	64 (71.91)	6 (6.74)	
Religions	Islam	92 (26.29)	83 (23.71)	175 (50.00)	0.817	109 (31.14)	196 (56.00)	45 (12.86)	0.670
	Hinduism	10 (32.26)	8 (25.81)	13 (41.94)		10 (32.26)	16 (51.61)	5 (16.13)	



	Buddhism	0 (0.00)	1 (50.00)	1 (50.00)		0 (0.00)	1 (50.00)	1 (50.00)	
	Christianity	0 (0.00)	0 (0.00)	1 (100.00)		0 (0.00)	1 (100.00)	0 (0.00)	
BMI (kg/m <sup>2</sup> )	Underweight	6 (35.29)	7 (41.18)	4 (23.53)	0.008*	5 (29.41)	12 (70.59)	0 (0.00)	0.145
	Normal	47 (28.66)	34 (20.73)	83 (50.61)		54 (32.93)	84 (51.22)	26 (15.85)	
	Overweight	18 (16.67)	24 (22.22)	66 (61.11)		25 (23.15)	69 (63.89)	14 (12.96)	
	Obese	31 (32.63)	27 (28.42)	37 (38.95)		35 (36.84)	49 (51.58)	11 (11.58)	
Residence	Rural	53 (29.61)	44 (24.58)	82 (45.81)	0.031*	59 (32.96)	100 (55.87)	20 (11.17)	0.226
	Semi-Urban	6 (13.04)	7 (15.22)	33 (71.74)		13 (28.26)	22 (47.83)	11 (23.91)	
	Urban	43 (27.04)	41 (25.79)	75 (47.17)		47 (29.56)	92 (57.86)	20 (12.58)	
Year of education	No formal education	12 (27.27)	13 (29.55)	19 (43.18)	0.064	16 (36.36)	26 (59.09)	2 (4.55)	0.002*
	Class 1-5	33 (23.57)	27 (19.29)	80 (57.14)		38 (27.14)	91 (65.00)	11 (7.86)	
	Class 6-10	42 (33.60)	36 (28.80)	47 (37.60)		37 (29.60)	67 (53.60)	21 (16.80)	
	Class 11-12	10 (23.26)	11 (25.58)	22 (51.16)		18 (41.86)	16 (37.21)	9 (20.93)	
Profession	Graduation	5 (19.23)	4 (15.38)	17 (65.38)		6 (23.08)	12 (46.15)	8 (30.77)	
	Post-Graduation	0 (0.00)	1 (16.67)	5 (83.33)		4 (66.67)	2 (33.33)	0 (0.00)	
	Housewife	18 (42.86)	9 (21.43)	15 (35.71)	0.365	7 (16.67)	33 (78.57)	2 (4.76)	0.001*
	Govt. Employee	3 (27.27)	3 (27.27)	5 (45.45)		2 (18.18)	6 (54.55)	3 (27.27)	
Marital status	Private Service	24 (25.53)	22 (23.40)	48 (52.06)		35 (37.23)	40 (42.55)	19 (20.21)	
	Business	23 (21.90)	23 (21.90)	59 (56.19)		35 (33.33)	51 (48.57)	19 (18.10)	
	Farmer	14 (29.79)	14 (29.79)	19 (40.43)		19 (40.43)	25 (53.19)	3 (6.3)	
	Retired	8 (24.24)	5 (15.15)	20 (60.61)		8 (24.24)	24 (72.73)	1 (3.03)	
	Unemployment	12 (23.08)	16 (30.77)	24 (46.15)		13 (25.00)	35 (67.31)	4 (7.69)	
	Married	99 (26.68)	86 (23.18)	186 (50.13)	0.140	116 (31.27)	204 (54.99)	51 (13.75)	0.506
	Single	3 (25.00)	6 (50.00)	3 (25.00)		3 (25.00)	9 (75.00)	0 (0.00)	
Personal monthly income (BDT)	Widowed	0 (0.00)	0 (0.00)	1 (100.00)		0 (0.00)	1 (100.00)	0 (0.00)	
	No	38 (32.76)	31 (26.72)	47 (40.52)	0.117	26 (22.41)	84 (72.41)	6 (5.17)	0.000*
	1-≤10,000	19 (26.03)	15 (20.55)	39 (53.42)		19 (26.03)	45 (61.64)	9 (12.33)	
	10,001-20,000	20 (21.51)	21 (22.58)	52 (55.91)		41 (44.09)	41 (44.09)	11 (11.83)	
	20,001-50,000	19 (22.35)	18 (21.18)	48 (56.47)		27 (31.76)	33 (38.82)	25 (29.41)	
	>50,000	6 (35.29)	7 (41.18)	4 (23.53)		6 (5.04)	11 (5.14)	0 (0.00)	
Smoking history	Current smoker	22 (18.03)	24 (19.67)	76 (62.30)	0.013*	40 (32.79)	64 (52.46)	18 (14.75)	0.691
	Former smoker	40 (28.99)	37 (26.81)	61 (44.20)		46 (33.33)	76 (55.07)	16 (11.59)	
	Never smoker	40 (32.26)	31 (25.00)	52 (42.74)		33 (26.61)	74 (59.68)	17 (13.28)	

Table-7 shows Cardiovascular Drug Therapy at Hospitalization of Covid-19 where Medical therapy included ACE inhibitors (22.1% of the patients), ARBs (20.57%), statins (11.71%), beta-blockers (18.23%), and

antiplatelet agents (14.32%). Insulin was used in 10.42% of the patients, and other hypoglycemic agents were used in 2.67%.

**Table 7: Cardiovascular Drug Therapy at Hospitalization of Covid-19**

Cardiovascular Drug Therapy	N	%
ACE inhibitor	85	22.1%
ARB	79	20.57%
Beta-blocker	70	18.23%
Antiplatelet	55	14.32%
Statin	45	11.71%
Insulin	40	10.42%
Other hypoglycemic agent	10	2.67%

Table-8 shows hospitalization status and outcome of the patients where mean length of hospital stay was 10.7±2.7 days, with an overall in-hospital

mortality of 5.8% (515 of 8910 patients) in this population of patients with completed outcomes.



**Table 8: Hospitalization status and outcome of the patients**

Hospitalization status and outcome of the patients	%
Mean length of hospital stay	10.7±2.7 days
Overall in-hospital mortality	5.8%

## DISCUSSION

Globally until 16 November 2020, there have been over 54 million COVID-19 cases confirmed with 1,316,502 deaths. From 8 March to 16 November 2020, according to the Directorate General of Health Services (DGHS) Bangladesh, 434,472 COVID-19 confirmed cases were detected by RT-PCR, including 6,215 COVID related deaths. Bangladesh is in the top 24th position in the world [11]. Our study showed that the age of the subjects ranged from 20-80 year with a mean age of 59.74 years, which was almost similar to the age of patients in different studies from China and India [12-17]. Male gender was more affected than female in our study, which was consistent with the results from abroad [12]. The comorbidities of our study were DM, hypertension, IHD and CKD, which were also common in Chinese population [18, 19].

Regarding clinical manifestations, in our study the most common symptom was anorexia; besides sore throat, diarrhea, vomiting, nausea, abdominal pain were also observed in a few cases which were more or less similar to the manifestations reported in several studies globally [6, 16, 17]. Common laboratory parameters of our study subjects were normal leukocyte with lymphopenia, elevated CRP and positive D-dimer coinciding with results of numerous studies [6, 16, 17]. Deranged liver enzymes, hyperferritinemia, high LDH, abnormal ECG were observed in some cases. Majority of our study subjects had poor glycemic control and it is one of the most important risk factor for increased morbidity and mortality in COVID-19, reported in different studies [20, 21]. Imaging findings like chest x-ray and HRCT scan of chest varied from no shadow to extensive involvement of both lungs which were used to classify the severity and management of the cases as per national guideline [10, 22]. Seventy percent of our patients were shifted to COVID dedicated hospitals and rest of the subjects were treated at our hospital.

The prevalence of depression and anxiety level was moderately high in this study. An abnormal degree of anxiety affected 49.5%, whereas borderline anxiety affected 23.9% of the study population. This conclusion resembles that of the Brazilian population (30), where it was found that 48.4% of CAD patients were anxious. Anxiety levels among CAD patients were slightly more pronounced in our study, which might be related to unemployment following sickness, level of illiteracy, a lack of knowledge about the prognosis of CAD, or even lack of counseling resources in a developing country context. In our study, around 55.7% of patients had borderline depression, and 13.2% had abnormal depression, whereas studies in Brazil 30 and Germany 31

revealed that 26.4 and 5.9% of CAD patients, respectively, had depression. Depression was found to be much higher among CAD patients in our study which could be due to a lack of information and limited access to quality health care, including the huge out of pocket expenditure. The sex of patients was also shown to be substantially related to their degree of anxiety with males having a higher level of anxiety than females.

## CONCLUSION

Our findings indicate that health care providers, particularly cardiologists and nurses, should take extra care to detect and evaluate all heart disease patients for level of anxiety and depression in a clinical setting. There is a need to develop a quick screening approach in hospitals dealing with cardiovascular inpatients to identify those needing extra evaluation and care.

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