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Research Article

Demographic and Clinical Profile Analysis of COVID-19 Positive Patients: A Tertiary Care Hospital Study in Bangladesh

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Abstract

Background: A few weeks following the initial outbreak in China, Bangladesh reported its first case of COVID-19 on March 8, 2020. Given the novelty of this disease, understanding the demographic and clinical characteristics of COVID-19 patients is crucial for advancing our knowledge and improving treatment strategies. Unfortunately, there is a need for more research-based data available on the demographic and clinical profiles of individuals who have tested positive for COVID-19 in Bangladesh.

Aim of the Study: This study aimed to examine the demographic and clinical characteristics of individuals who tested positive for Covid-19 in Bangladesh.

Methods: This cross-sectional study was carried out at Shahabuddin Medical College Hospital's Department of Medicine in Dhaka, Bangladesh. The study was conducted over two years, starting in June 2019 and concluding in July 2021. Forty-six individuals were confirmed as COVID-19 positive through RT-PCR (Reverse Transcription Polymerase Chain Reaction) testing. They sought treatment at this hospital during the specified research timeframe and were chosen as the study participants. Information was gathered directly from the patients or their caregivers through either face-to-face interviews or telephone interviews, utilizing a questionnaire that had been pre-designed for this purpose. Subsequently, the collected data were subjected to statistical analysis using SPSS version 22.0.

Results: In this study, among total patients, the male-female ratio was 1.4:1. The mean ± SD age and BMI were 53.39 ± 12.92 years and 43.80 ± 7.97 Kg/M^2 respectively. In analyzing the clinical symptoms among the patients, we found, the highest number of patients were with cough which was found among 43.5%. Besides this, shortness of breath, hypoxemia/oxygen use and lower limb swelling were found among 23.9%, 21.7% and 17.4% patients respectively which was noticeable. In this study, bilateral lung involvement was found in 76% cases and as HRCT pattern, ground glass opacity (GGO) with consolidation was found in 61% cases which were noticeable. As comorbidity, in about half (48%) of the patients, DM was found. HTN, IHD and CKD were found among 23.9%, 17.4% and 10.9% cases respectively. Among total patients, in 23.9% moderate and in 19.6% severe shortness of breath was found.

Conclusion: According to the observation of this study, we can conclude that, middle aged people are the most prone to COVID19 in Bangladesh. The affected number of male patients was higher than that of female patients. BMI or body weight was not associated with the possibilities of being affected by COVID 19. Cough, shortness of breath as well as hypoxemia may be considered as the most potential clinical features and HTN and DM may be considered as the most potential comorbidities to be considered for a COVID 19 patient.

Keywords: *Demographic Profile; Clinical; COVID 19; RT-PCR; Bangladesh*

Introduction

Given that COVID-19 is a relatively recent disease, it is crucial to analyze the demographical and clinical characteristics of COVID-19-positive patients to enhance our understanding and treatment strategies. Regrettably, our understanding of the social, demographic, and clinical characteristics of COVID-19 patients in Bangladesh remains quite constrained. The novel coronavirus was first identified on December 31, 2019, in Wuhan, China [1]. Bangladesh recorded its first COVID-19 cases on March 8, 2020. COVID-19 predominantly transmits via respiratory droplets and proximity to infected individuals [2]. While the severity of COVID-19 has been decreasing over time, individuals with COVID-19 continue to be a significant source of infection worldwide [3]. The pandemic's ever-changing course and the pervasive ambiguity surrounding COVID-19 can give rise to psychological anguish and mental health challenges, encompassing conditions such as depression, anxiety, and traumatic stress [4]. Experts still lack a clear trajectory for the COVID-19 pandemic, including projected case numbers, fatalities, and the extent to which quarantine measures will disrupt daily life. As of July 1, 2020, the COVID-19 pandemic had spread to all of Bangladesh's 64 administrative districts, causing 145,000 confirmed cases and 1,874 deaths [5]. In individuals afflicted with COVID-19, the predominant clinical manifestations usually encompass a severe onset of respiratory distress, accompanied by indicators such as elevated body temperature, persistent coughing, and difficulty breathing [6]. However, a rising trend of unusual manifestations, including patients with no respiratory symptoms or only mild ones, is observed worldwide [7]. This study was conducted to gain a comprehensive understanding of the demographic and clinical profiles of COVID-19 patients. While several studies have explored local demographic, epidemiological, and clinical features, statistical data are scarce for COVID-19 patients in Bangladesh [8].

Objectives of the Study

General objective

To analyze demographic profile of COVID 19 positive patients.

Specific objective

To collect information regarding the clinical symptoms and comorbidities of COVID 19 positive patients.

Materials and Methodology

This study was a cross-sectional investigation carried out at Shahabuddin Medical College Hospital's Department of Medicine in Dhaka, Bangladesh, from June 2019 to July 2021. The research cohort consisted of 46 individuals confirmed as COVID-19 positive through RT-PCR (Reverse Transcription Polymerase Chain Reaction) testing and sought treatment at the abovementioned hospital during the study period. Following the revised Declaration of Helsinki, written consent was diligently obtained from all patients or their legal guardians. Additionally, the study protocol had received approval from the hospital's ethical committee. Comprehensive demographic information, including age, gender, place of residence, contact history, and clinical data, such as presenting symptoms, comorbidities, and disease duration, were meticulously documented. Qualitative variables, such as symptoms like fever, cough, dyspnea, and headache, were expressed as frequencies and percentages. Conversely, quantitative variables like age and duration of hospital stay were presented as mean values accompanied by standard deviations. Statistical analyses were performed using the unpaired t-test for quantitative variables and the Chi-square test for qualitative variables, each applied separately to distinct clinical presentations. Furthermore, a multivariate logistic regression analysis was conducted to identify potential risk factors associated with mortality. This involved calculating odds ratios with corresponding 95% confidence intervals. A significance level of $p < 0.05$ was considered statistically significant. Data was collected by direct or telephonic interviews with patients or their caregivers, employing a pre-designed questionnaire. The statistical analysis was carried out using SPSS version 22.0.

Results

In this study, among total patients, 58.7% were male and the rest 41.3% were female. So, male patients were dominating in number and the male-female ratio was 1.4:1. The highest number of patients of this study were from 41 - 50 years' age group which was 34.8%. Besides

this 4.3%, 10.9%, 21.7%, 19.6% and 8.7% patients were from ≤ 30 yrs., 31 - 40 yrs., 51 - 60 yrs., 61 - 70 yrs. and > 70 years' age groups respectively. According to the BMI status of the patients, we observed that, majority portion patients were with normal body-weight (BMI: 18.5 - 24.9) which was in 69% and the rest 31% were with overweight (BMI: 25.0 - 29.9). The mean ± SD BMI of the patients was 43.80 ± 7.97 Kg/M^2. In analyzing the clinical symptoms among the patients, we found, the highest number of patients were with cough which was found among 43.5%. Besides this, shortness of breath, hypoxemia/oxygen use and lower limb swelling were found among 23.9%, 21.7% and 17.4% patients respectively which was noticeable. As laboratory tests, the levels/counts of WBC, neutrophil (N), leukocytes (L), serum creatinine, electrolytes, CRP, D-Dimer, IL-6, Ferritin and LDH were recorded. In this study, bilateral lung involvement was found in 76% cases and as HRCT pattern, ground glass opacity (GGO) with consolidation was found in 61% cases which were noticeable. In this study, in analyzing the comorbidities among the patients we observed that, about half (48%) patients were with diabetes mellitus (DM). Besides this hypertension (HTN), ischemic heart disease (IHD) and chorionic kidney disease (CKD) were found among 23.9%, 17.4% and 10.9% cases respectively. Among total patients, in 23.9% moderate and in 19.6% severe shortness of breath was found. In assessing the outcomes among patients, we observed that, at follow-up stage, majority (85%) patients were improving in condition whereas 13% were stable and 2% (n = 1) were in slow progressing.

Characteristics	Frequency (n)	Percentage (%)	P-value
Age (in years)			
≤ 30	2	4.3%	0.614
31 - 40	5	10.9%	
41 - 50	16	34.8%	
51 - 60	10	21.7%	
61 - 70	9	19.6%	
> 70	4	8.7%	
Mean ± SD	53.39 ± 12.92		0.443
Sex			
Male	27	58.7%	
Female	19	41.3%	
Male Female Ratio	1.4:2		

Table 1: *Demographic characteristics of the patients (N = 46).*

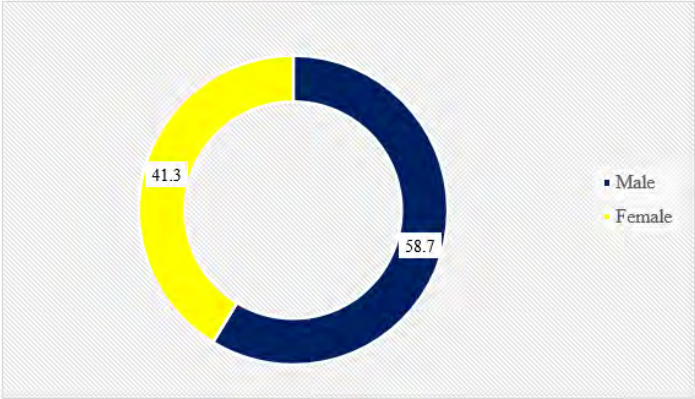

Figure 1: *Gender distribution of patients (N = 46).*

Clinical Profiles	Covid-19 Patients (Positive) (N = 46)		P-value
	Mean ± SD	n (%)	
BMI distribution	43.80 ± 7.97		0.223
Age in year	22.15 ± 5.67		0.913
Major symptoms distribution			
Cough		20 (43.5%)	0.024
Shortness of breath		11 (23.9%)	0.077
Hypoxemia/Oxygen use		10 (21.7%)	0.038
Fever		8 (17.4%)	0.592
Diarrhea		7 (15.2%)	0.12
Lower Limb Swelling		5 (10.9%)	0.38
Laboratory findings distribution (Mean ± SD)			
White blood cell (WBC)	8.19 ± 4.09		0.279
Neutrophil (N)	74.38 ± 9.32		0.743
Leukocytes (L)	16.22 ± 8.13		0.996
S. Creatinine	2.09 ± 1.88		0.66
Na^+	101.09 ± 16.64		0.55
K^+	4.82 ± 0.98		0.163
Cl^-	96.59 ± 9.22		0.568
CRP	42.22 ± 35.32		0.584
D-Dimer	237.09 ± 188.85		0.586
IL-6	37.32 ± 27.83		0.78
Ferritin	399.81 ± 307.52		0.029
LDH	159.43 ± 52.35		0.994
Findings of HRCT chest along with lung distribution			
HRCT Pattern			
Ground glass opacity (GGO)		18 (39.1%)	0.736
Ground glass opacity (GGO) with Consolidation		28 (60.9%)	
Distribution of lung involvement			
Central		0 (0.00%)	0.457
Peripheral		20 (43.5%)	0.457
Diffuse		22 (47.8%)	0.594
Bilateral		35 (76.1)	0.755

Table 2: *Clinical profiles among the patients (N = 46).*

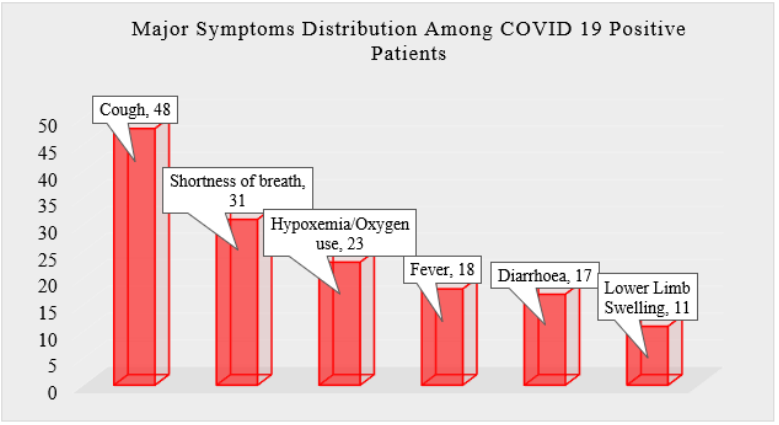

Figure 2: *Major symptoms distribution among the patients (N = 46).*

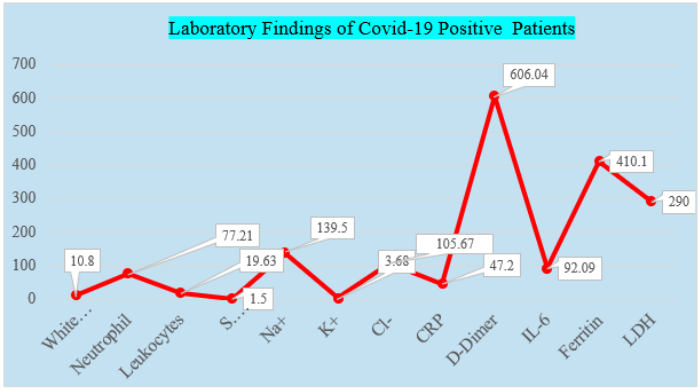

Figure 3: *Laboratory findings of Covid-19 positive patients (N = 46).*

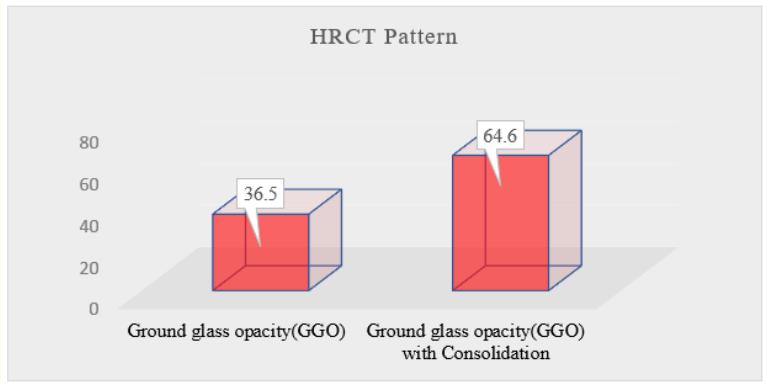

Figure 4: *HRCT pattern of the patients (N = 46).*

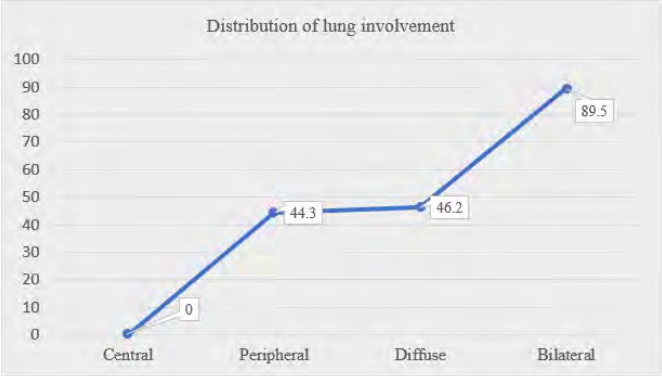

Figure 5: *Lung involvement distribution between the patients (N = 46).*

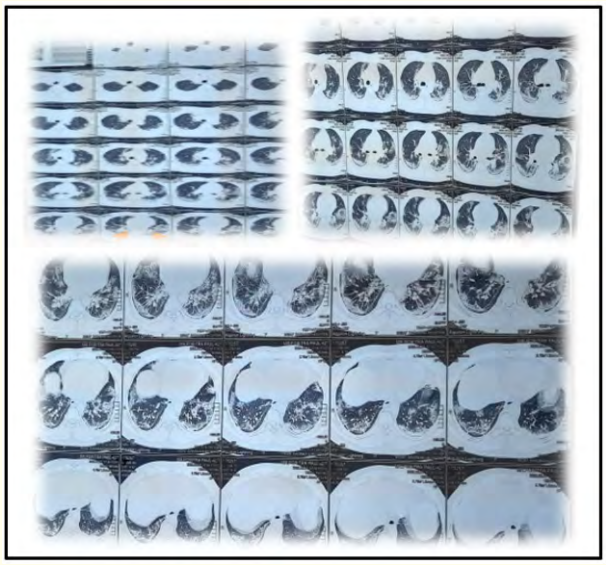

Figure 6: *Ground glass opacity lung involvement (N = 46).*

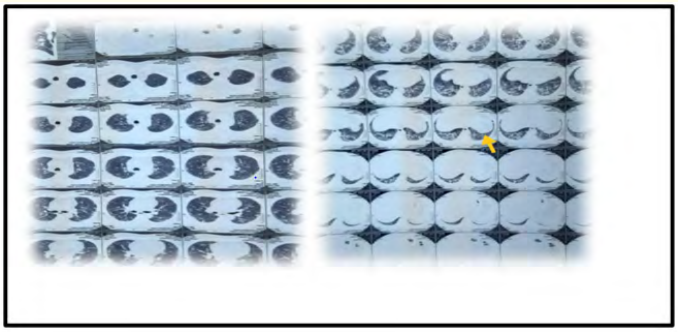

Figure 7: *Ground glass opacity with consolidation lung involvement (N = 46).*

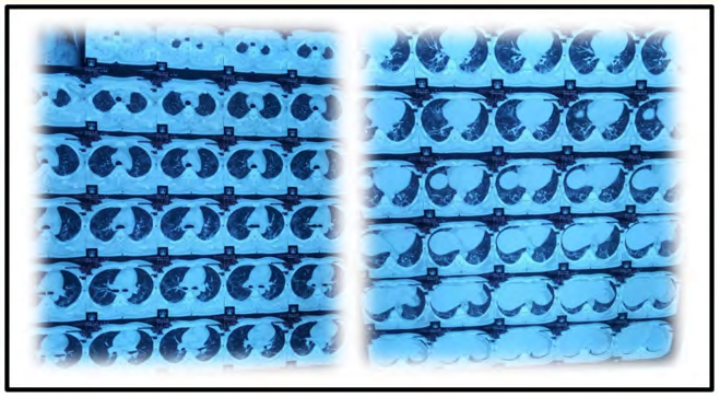

Figure 8: *Bilateral Involvement of lung (N = 46).*

Co-morbidities and Risk factors	Frequency (n)	Percentage (%)	P-value
Diabetes Mellitus (DM)	22	47.8%	0.070
Hypertension (HTN)	11	23.9%	
Ischemic heart disease (IHD)	8	17.4%	
Chorionic Kidney Disease (CKD)	5	10.9%	

Table 3: *Comorbidities of the study population (N = 46).*

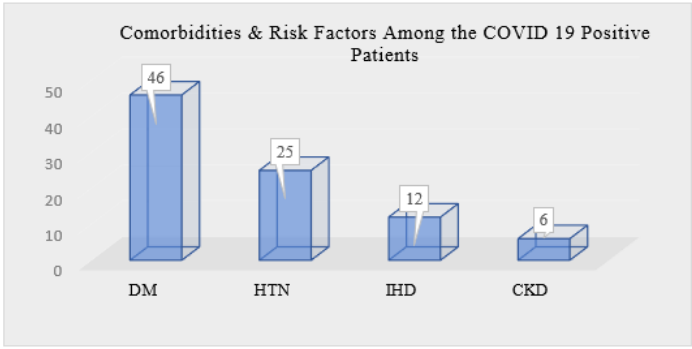

Figure 9: *Comorbidities of the patients (N = 46).*

Shortness of Breath (SOB)	Frequency (N)	Percentage (%)	P-value
Mild	1	2.2%	0.319
Moderate	11	23.9%	
Severe	9	19.6%	
Normal	25	54.3%	

Table 4: *Distribution of study patients based on shortness of breath (N = 46).*

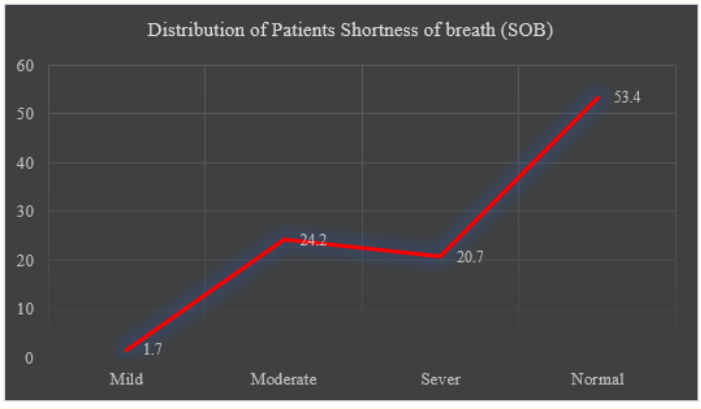

Figure 10: *Distribution of patients shortness of breath (SOB) (N = 46).*

Saturation	Mean ± SD	P Value
O_2 Saturation with $2LO_2$	95.85 ± 2.03	0.652
O_2 Saturation with_$3LO_2$	96.57 ± 1.49	0.457
O_2 Saturation with_$4LO_2$	94.96 ± 2.38	0.550
O_2 Saturation with_$5LO_2$	94.33 ± 2.83	0.215
O_2 Saturation with_$6LO_2$	94.24 ± 3.41	0.072
O_2 Saturation with_$7LO_2$	93.89 ± 2.64	0.994
O_2 Saturation without	94.80 ± 4.70	0.264
O_2 Saturation RA	91.59 ± 4.33	0.992

Table 5: *Comparison of mean saturation (N = 46).*

Clinical Progress	Frequency (N)	(%)	P-value
Improving	39	84.8%	0.378
Stable	6	13.0%	
Slow	1	2.2%	

Table 6: *Distribution of study patients based on clinical progress (N = 46).*

Figure 11: *Patients clinical progress of patients (N = 46).*

Outcome	Frequency (N)	(%)	P-Value
Good	43	93.5%	0.139
Not good	3	6.5%	

Table 7: *Distribution of study patients based on outcome (N = 46).*

Discussion

This study aimed to establish a comprehensive demographic and clinical profile of individuals who tested positive for COVID-19 in Bangladesh. The study population consisted of 46 individuals confirmed to have COVID-19 through Reverse Transcription Polymerase Chain Reaction (RT-PCR) testing and sought treatment at the designated hospital during the study period. Bangladesh officially reported its initial COVID-19 cases in Dhaka on March 8th 2020 [9]. Having recorded the highest number of confirmed cases, Dhaka was consequently regarded as the epicenter of disease transmission in Bangladesh [10]. In their study, Hossain and colleagues found that a significant proportion of the confirmed cases in Bangladesh, approximately 48.9%, had either resided in Dhaka or visited the city within the 14 days preceding the onset of their illness. Additionally, some of these cases had close contact with Dhaka residents [11]. In this study among total patients, 58.7% were male and the rest 41.3% were female. The male-female ratio was 1.4:1 which showed male dominating. The highest number of patients of this study were from 41 - 50 years' age group which was 34.8%. Besides this 4.3%, 10.9%, 21.7%, 19.6% and 8.7% patients were from ≤ 30 yrs., 31 - 40 yrs., 51 - 60 yrs., 61 - 70 yrs. and > 70 years' age groups respectively. According to the BMI status of the patients, we observed that, majority portion patients were with normal body-weight (BMI: 18.5 - 24.9) which was in 69% and the rest 31% were with overweight (BMI: 25.0 - 29.9). The mean ± SD BMI of the patients was 43.80 ± 7.97 Kg/M^2. Many of these findings are similar to that of Asia, e.g. China [6] (Median age: 47 years; 41.9% female), India [12] (Mean age 40.3 years, 66.7% male) and other study reports from Bangladesh [13] (43%, 21-40 years in range and female: male ratio 1:2.33). Research conducted in the United States involving individuals with a median age of 63 years and a separate study in Europe with a median age of 67.5 years both reported a higher prevalence of male patients despite variations in the age of the study populations [14,15]. Our analysis of clinical symptoms among the patients showed that the most prevalent symptom was a cough, affecting 43.5%. Additionally, we noted that shortness of breath, hypoxemia (requiring oxygen therapy), and lower limb swelling were present in 23.9%, 21.7%, and 17.4% of the patients, respectively, which was quite notable. It is worth mentioning that the initial reports from China described fever, dry cough, dyspnea (breathing difficulties), headache, and pneumonia as the typical clinical symptoms of COVID-19 [8]. In this study, in analyzing the comorbidities among the patients we observed that, about half (48%) patients were with diabetes mellitus (DM). Besides this hypertension (HTN), ischemic heart disease (IHD) and chorionic kidney disease (CKD) were found among 23.9%, 17.4% and 10.9% cases respectively. We comprehensively reviewed recent meta-analyses on the relationship between comorbidities and disease progression [16-18]. These meta-analyses reached a consensus, highlighting that cardiovascular disease, hypertension, diabetes, and COPD are consistently linked to adverse outcomes in individuals with COVID-19.

Limitations of the Study

While this study focused on a specific population with a limited sample size, it is essential to note that the results may partially represent the entire country's situation.

Conclusion and Recommendations

According to the findings of the study, individuals in the middle age bracket are at the highest risk of contracting COVID-19 in Bangladesh. Moreover, there is a higher incidence of COVID-19 among males than females. The study found no significant association between BMI or body weight and the likelihood of COVID-19 infection. Symptoms such as cough, shortness of breath, and hypoxemia are among the most prominent clinical indicators. At the same time, hypertension (HTN) and diabetes mellitus (DM) are the primary comorbidities to consider in COVID-19 patients. Given these results, we recommend conducting further studies in various locations with larger sample sizes to gather more robust and dependable information.

Bibliography

1. Ruan S. "Likelihood of survival of coronavirus disease 2019". *The Lancet Infectious Diseases* 20.6 (2020): 630-631.
2. Yang F., *et al*. "Pulmonary rehabilitation guidelines in the principle of 4S for patients infected with 2019 novel coronavirus (2019-nCoV)". *Zhonghua Jie He He Hu Xi Za Zhi* 43.3 (2020): 180-182.
3. Chen ZM., *et al*. "Diagnosis and treatment recommendations for pediatric respiratory infection caused by the 2019 novel coronavirus". *World Journal of Pediatrics* 16.3 (2020): 240-246.
4. Zandifar A and Badrfam R. "Iranian mental health during the COVID-19 epidemic". *Asian Journal of Psychiatry* 51 (2020): 101990.
5. IEDCR. Covid-19 Status Bangladesh (2020).
6. Guan WJ., *et al*. "Clinical Characteristics of Coronavirus Disease 2019 in China". *The New England Journal of Medicine* 382.18 (2020): 1708 1720.
7. Pauline V., *et al*. "Clinical features of covid-19, The wide array of symptoms has implications for the testing strategy". *British Medical Journal* 369 (2020): m1470.
8. Huang C., *et al*. "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China". *Lancet* 395.10223 (2020): 497-506.
9. Reuters. Bangladesh confirms its first three cases of coronavirus (2020).
10. WHO, Bangladesh. Situation report coronavirus (COVID- 19)- 14 (2020).
11. Hossain I., *et al*. "The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) In Bangladesh: A Descriptive Study". *Journal of Medical Science And Clinical Research* 08.04 (2020): 544-551.
12. Gupta N., *et al*. "Clinical and epidemiologic profile of the initial COVID-19 patients at a tertiary care centre in India". *Monaldi Archives for Chest Disease* 90.1 (2020): 193-196.
13. Tian Y., *et al*. "Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission". *Alimentary Pharmacology and Therapeutics* 51.9 (2020): 843-851.
14. Richardson S., *et al*. "Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized with COVID-19 in the New York City Area". *The Journal of the American Medical Association* 323.20 (2020): 2052-2059.
15. Colaneri M., *et al*. "Clinical characteristics of coronavirus disease (COVID-19) early findings from a teaching hospital in Pavia, North Italy, 21 to 28 February 2020". *Eurosurveillance* 25.16 (2020): 2000460.
16. Singh AK., *et al*. "Prevalence of co-morbidities and their association with mortality in patients with COVID-19: a systematic review and meta-analysis". *Diabetes, Obesity and Metabolism* 22.10 (2020): 1915-1924.
17. Dorjee K., *et al*. "Prevalence and predictors of death and severe disease in patients hospitalized due to COVID-19: a comprehensive systematic review and meta-analysis of 77 studies and 38,000 patients". *PLoS One* 15.12 (2020): e0243191.
18. Nandy K., *et al*. "Coronavirus disease (COVID-19): a systematic review and meta-analysis to evaluate the impact of various comorbidities on serious events". *Diabetology and Metabolic Syndrome* 14.5 (2020): 1017-1025.

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