Clinical profile and short-term outcomes of RT-PCR positive COVID-19 patients in a tertiary care hospital in Dhaka, Bangladesh

Md Zabir Hasan (✉ zabir.hasan@gmail.com)

University of British Columbia <https://orcid.org/0000-0001-8730-0054>

Nirmol Kumar Biswas

Maternal & Child Health Training & Research Institute

Ahmad Monjurul Aziz

Maternal & Child Health Training & Research Institute

Juli Chowdhury

NICVD: National Institute of Cardiovascular Diseases

Shams Shabab Haider

BRAC University James P Grant School of Public Health

Malabika Sarker

BRAC University James P Grant School of Public Health

Original article

Keywords: COVID-19, Clinical Characteristics, Post-COVID-19 Complications, Post-COVID-19 Fatigue Syndrome, Oxygen Saturation, Bangladesh

Posted Date: February 8th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-157669/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Version of Record: A version of this preprint was published at BMJ Open on November 1st, 2021. See the published version at <https://doi.org/10.1136/bmjopen-2021-055126>.

Abstract

Background: After one year since emerging from Wuhan, China, the Coronavirus disease 2019 (COVID-19) pandemic is still raging worldwide. Still, there is a dearth of original research exploring the attributes of COVID-19 patients from lower-and middle-income countries, such as Bangladesh. Based on a case series from a tertiary healthcare center, this observational study has explored the epidemiological and clinical profile of COVID-19 patients in Dhaka, Bangladesh. A total of 422 COVID-19 confirmed patients (via Reverse transcription-polymerase chain reaction test) were enrolled in this study. We have compiled patients' medical records and reported their demographic, socioeconomic, and clinical features, treatment history, health outcome, and post-discharge complications descriptively.

Result: Patients were predominantly male (64%), between 35 to 49 years (28%), with at least one comorbidity (52%), and had COVID-19 symptoms for one week before hospitalization (66%). A significantly higher proportion ($P<0.05$) of male patients had diabetes, hypertension, and ischemic heart disease, while females had a significantly higher proportion ($P<0.05$) of asthma. The most common symptoms were fever (80%), cough (60%), dyspnea (41%), and sore throat (21%). Most patients received antibiotics (77%) and anticoagulant therapy (56%) and stayed in the hospital for an average of 12 days. Over 90% of patients were successfully weaned, while 3% died from COVID-19, and 41% reported complications after discharge.

Conclusion: The diversity of clinical and epidemiological characteristics and health outcomes of COVID-19 patients across age groups and gender is noteworthy. Our result will inform the clinicians and epidemiologists of Bangladesh of their COVID-19 mitigation effort.

1. Introduction

Globally, over the past year, the Coronavirus disease (COVID-19) pandemic has escalated and continues to threaten the health and wellbeing of the population. The virus has already transmitted to more than 75 million people from over 213 countries and territories, with nearly 1.6 million deaths as of 20 December 2020, indicating an overall death rate per number of diagnosed cases as 2.27% [1]. Early epidemiological studies on COVID-19 from Wuhan, China, reveals infection predominantly resulted in acute respiratory illness. However, the clinical spectrum ranged from asymptomatic or mild upper respiratory tract illness to severe viral Pneumonia with respiratory failure and even death [2,3]. Roughly 20% of cases lead to clinically complex and severe conditions. The most vulnerable group were adults older than 60 years of age with comorbid conditions, including diabetes, hypertension, and cardiovascular disease [2–4]. Recent studies have also indicated that COVID-19's clinical spectrum may vary across diverse ethnic backgrounds and geographic locations worldwide [5].

In the months following the emergence of the pandemic, health systems were overwhelmed due to the sheer number of the cases, partially attributed to the comparatively high "basic reproductive number" (R_0) of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) – ranged between 2.24 and 3.58 [6,7]. The high transmissibility of SARS-CoV-2 is particularly perilous for the densely populated countries [8–10], specifically in Southeast Asia [11,12]. Therefore, the 162.6 million people of Bangladesh, one of the most densely populated nations, are especially vulnerable to this raging virus. The first confirmed case of SARS-CoV-2 infection was reported in Dhaka, the capital of Bangladesh, on 8 March 2020 [13], which was followed by a nationwide lockdown from 26 March 2020 to mitigate the transmission of the virus and allow the healthcare system to prepare itself from the onslaught of the COVID-19 cases [14].

However, during the lockdown's initial days, there was a mass exodus of 11 million residents from Dhaka who took this opportunity to wait out the lockdown period in their home districts or villages, which likely only expedited the spread of the disease. On 25 April 2020, the lockdown was partially lifted to restart the economy by allowing workers to return to their station in ready-made garment factories, industries, and private offices. The migrating workforce with limited awareness and opportunity of social distancing and safe hygienic practices ultimately led to millions of additional viral transmissions [15]. After a series of extensions, the 'partial lockdown' was lifted, but cases had already been identified in all 64 districts nationwide [16]. By 11 January 2021, Bangladesh had reached 522,453 confirmed cases of COVID-19, with 566,801 recovered patients and 7,781 deaths. Though the country observed a decreasing number of weekly cases, the number of weekly deaths is gradually increasing [16].

Beyond the difficulties of enforcing the nationwide lockdown and promoting social distancing norms, the healthcare system of Bangladesh was also underprepared to handle such a large-scale pandemic [17]. At the start of the pandemic, only 1,169 Intensive Care Unit beds were available in the entire country, the majority (737 beds) in private hospitals. Besides, there was an insufficient

supply of high-quality personal protective equipment, confirmative tests, medications, and logistics [18,19]. However, dealing with a healthcare emergency of this scale has left much room for research and examination of the system's effectiveness in treating patients.

Although previous studies detailed the clinical presentation of hospital-admitted Reverse transcription-polymerase chain reaction (RT-PCR) positive COVID-19 patients, very few of these originate from an LMIC, and fewer still from Bangladesh [20,21]. To our knowledge, no previous study from Bangladesh has been able to present a comprehensive clinical profile of COVID-19 patients by examining the full suite of patients' characteristics, clinical presentation, diagnostic test results, treatment regimen, health outcomes, and any reported complications during the follow-up. This study describes the epidemiological and clinical features, as well as health outcomes of COVID-19 patients admitted to a tertiary health facility in Dhaka, Bangladesh.

2. Methodology

2.1 Study setting and design

It is a single-center, retrospective, observational case series study conducted at a Government tertiary health facility in Dhaka, Bangladesh. The healthcare facility was declared a COVID-19 dedicated hospital during the early stage of the pandemic and operated its COVID-19 inpatient service between 16 April to 5 September 2020. Information of all admitted confirmed COVID-19 patients in this facility were included in this study.

2.2 Data source

During the study period – between 16 April to 5 September 2020 – a total of 442 suspected COVID-19 patients were admitted to the study hospital. Among them, 422 patients had confirmed the SARS-CoV-2 infection by RT-PCR test, who were considered as the analytical sample for our study. We have retrospectively compiled the medical records of the hospitalized COVID-19 confirmed patients, which includes demographic information, presented signs and symptoms, self-reported comorbidity of the patients during the initial consultation, the result of diagnostic tests, and medications provided to the patients. As part of the facility's clinical care protocol, the discharged patients were reached out for follow-up via teleconsultation. We have also included information related to the persistent complications of COVID-19 among the discharged patients as part of the analysis. The sample size of the different components of the study is presented in Figure 1.

The information collected from the patients and their medical record were entered in a Microsoft EXCEL workbook by two researchers, followed by double-checking the record for any inconsistency. One senior researcher re-assessed the data quality by reviewing the raw data and made any necessary corrections. The clean data were imported into statistical software for analysis. We used Stata, version 15.1 [22], to perform the data management and statistical analysis, and to develop the data visualizations, we have used R software, version 4.0.1 [23].

2.3 Variables and definitions

All demographic covariates of the patients were recoded into categorical variables. Patients were stratified into age categories of – less than 19 years, 19-24 years, 25-34 years, 35-49 years, 50-59 years, and more than 59 years, which corresponds to child and adolescents, younger adults, adults, older adults, seniors, and older seniors. While providing their demographic information, the patients self-reported their monthly income in four categories – 5-10 thousand, 10-30 thousand, 30-50 thousand, and more than 50 thousand. Bangladeshi Taka (BDT).

During the initial consultation, the patients also provided information related to their smoking habits, existing comorbidities (such as Hypertension, Diabetes Mellitus, Asthma, chronic heart, and kidney diseases, etc.), history of contact with any confirmed COVID-19 patients, duration of symptoms, the outcome of the hospitalization. The symptoms include body temperature more than 38°C, cough, difficulty in breathing (dyspnea), sore throat, bodily discomfort (malaise), diarrhea, headache, weakness, runny nose, loss of taste, loss of sense of smell (anosmia), vomiting, vertigo, and abdominal pain.

We have also compiled the clinical history of the patients, which includes medication provided to the patients in response to the illness resulted from COVID-19, and performed diagnostic tests. The medication history was clustered as antibiotics for secondary infections, Hydroxychloroquine, Anticoagulants, Glucocorticoid therapy, oxygen support, and other medications. However, we did not present the frequency or the doses of the medication.

We have categorized the result of the diagnostic tests performed into “Good” or “Poor” prognostic values as follows: X-ray finding suggestive of pneumonia: as present or absent based on radiologist’s report; serum creatinine level: poor = >1.2mg/dL and good = ≤1.2mg/dL, serum glutamic pyruvic transaminase (SGPT): poor = >40 U/L and good = ≤40 U/L; serum c- reactive protein: poor = ≥6 mg/L and good = <6 mg/L; blood D-dimer: poor = >500 ng/mL and good = ≤500 ng/mL; blood hemoglobin: poor = <10 gm/dL and good = ≥10 gm/dL; total count of White blood cell (WBC): poor = <4000/μL and good = ≥ 4000/μL and <11000/μL; blood Neutrophil Lymphocyte ratio: poor = >3.5 and good = ≤3.5; differential count of Monocytes: poor = >8% and good = 2-8%; differential count of Eosinophils: poor = >4% and good = 1-4%; and blood Platelet level: poor = <150000/μL and good = ≥ 150000/μL.

During the follow-up via teleconsultation, the patients reported a wide range of persistent symptoms as self-reported complications. We have documented responses from the patients' medical records and aggregated them into broad categories of respiratory, cardiovascular, abdominal, otolaryngologic (ears, nose, and throat), musculoskeletal, febrile, post-COVID fatigue syndrome, other miscellaneous, death, and none as reported complications.

2.4 Statistical Analysis

As the case series of COVID-19 patients presented some selection bias– the patients' sample was not selected by random sampling – we have only focused on descriptive analysis of information derived from the COVID-19 patients. To describe the characteristics of the study sample, we have categorized their demographic information, health status, and signs and symptoms associated with COVID-19, which were summarized as counts and percentages. These attributes of the sample were further disaggregated across gender and age categories to assess their association using χ^2 test at the significance level of $P < 0.05$ (in case of small sample size, less than 5, in the bivariate cells Fisher's exact test was used).

Next, considering the lowest recorded Oxygen Saturation (SpO₂) of the patient as a cardinal prognostic factor, we have explored the statistical association between a binary indicator of SpO₂ (> 93% as good, and ≤ 93% as poor) and key demographic and health-related indicators of the patients. We have also investigated a similar association between the result of the diagnostic tests of the patients and their SpO₂ to identify any significant association which may provide further insight on the hematological correlates of COVID-19.

To understand the patients' treatment regimen pattern, we have presented descriptive statistics of the medication provided to different age groups and genders. Lastly, we have attempted to visualize the persistent complications self-reported by the patients during the follow-up. As presented in Figure 1, the different components of the analysis had a varying number of samples due to the limited availability of the data. However, during the analysis, we did not impute any missing data.

2.5 Compliance with ethical standards

The result of this retrospective study was based on the data obtained during the clinical provision of care. During the compilation of the data, all medical records were anonymized to protect the confidentiality of the patients. The institutional review board of the James P. Grant School of Public Health, BRAC University, has provided the ethical approval of the study protocol (Ref. No: IRB-7 December'20-054).

3. Results

3.1 Demographic and clinical characteristics of the patients

Of the 442 patients admitted to the hospital, 422 had SARS-CoV-2 infection confirmed by the RT-PCR test. Among the confirmed COVID-19 patients, 64% (n = 271) were male, and 36% (n = 150) were female, and among them four female patients were pregnant. The demographic and health characteristics of the patients are presented in Tables 1 and 2, disaggregated according to their gender and age.

Among the admitted COVID-19 patients, the majority of patients (28%, n = 120) were 35-49 years old. While most of the patients (38%, n = 159) were service holders, the study sample consisted of 17% (n = 71) healthcare workers. Around 41% (n = 168) of the patients could not recall any contact history with previously confirmed COVID-19 patients, and an additional 40% (n = 164) patients provided

positive contact history. Before admitting to the hospital, almost two-third (66%, n = 277) of the patients had the symptoms of COVID-19 for one week. Half of the patients (52%, n = 154) reported having at least one underlying comorbidity.

Male patients reported a higher proportion of comorbidity than females (69% vs. 41%), though it was not statistically significant. However, looking into individual type of comorbidity, significantly higher proportion of male patients had Diabetes ($P < 0.001$), Hypertension ($P < 0.001$), Ischemic heart disease ($P = 0.048$) compared to the female patients (Figure 2), while 30% (n = 22) females presented with Asthma, compared to 14% (n = 16) men and this difference is statistically significant ($P = 0.027$). At triage in the hospital, out of 422 patients, 379 presented any clinical feature of COVID-19, and the most common symptom (80%) was fever (Figure 3). Consequently, the next three most frequent symptoms were associated with respiratory systems, which were cough (60%, n = 227), dyspnea (41%, n = 155), and sore throat (21%, n = 81).

The clinical record showed the blood SpO₂ level of 304 patients (72% of the study sample). A lower SpO₂ level is a critical factor indicating the severity of COVID-19, and Table 3 presents the SpO₂ level ($\leq 93\%$ vs. $> 93\%$) according to the patients' characteristics.

The SpO₂ level of the patients presented significant association with their age ($P < 0.001$), occupation ($P = 0.002$), and presence of underlying comorbidity ($P < 0.001$). We have observed that lower SpO₂ levels were reported for older patients. Similarly, almost twice as many patients with lower SpO₂ levels reported comorbidity (69% vs. 31%), indicating a strong association between the underlying health condition and the severity of the disease among confirmed COVID-19 patients.

3.2 Radiological and laboratory findings

Of the confirmed patients, 274 had their chest X-ray available, while computed tomography (C.T.) of the chest was not conducted due to resource constraints. Table 4 shows the radiological findings and the result of laboratory investigations during hospitalization. X-ray finding suggestive of Pneumonia was observed among 39 % (n = 107) of the patients, indicated by mixed inhomogeneous opacity in the posterior-anterior (P.A.) view of lung X-ray.

Laboratory findings suggests, only 3% (n = 2) and 10% (n = 7) patients presented leukopenia and thrombocytopenia accordingly. However, 29% (25 out of 85) patients had their Neutrophil Lymphocyte Ratio elevated more than 3.5 times. Among other findings, elevated level of SGPT (58.54%, n = 144), C-reactive Protein (37%, n = 90), serum creatinine (21%, n = 53), and D-dimer (22%, n = 32) were observed. SpO₂ level was significantly associated with radiological findings of Pneumonia ($P < 0.001$), serum Creatinine ($P < 0.011$), serum C-reactive Protein ($P = 0.004$), and Neutrophil Lymphocyte Ratio ($P = 0.001$). The patients with lower SpO₂ level had the poor prognostic values of the radiological and laboratory findings.

3.3 Treatment and medications

All patients (n = 422) received symptomatic medication for their illness during hospitalization. Table 5 presents the treatment and medication given to patients.

Majority of the patients received antibiotics (77%, n = 318), and anticoagulants therapy (56%, n = 232). These proportions were even higher among the patients with lower SpO₂ levels – 93% and 87% for antibiotic and anticoagulants therapy accordingly. Overall, 63% (n = 262) patients received oxygen supplementation. Except for one patient, everyone presented with a SpO₂ level $\leq 93\%$ received oxygen supplement, and more than half of the patients (59%, n = 114) received oxygen supplement despite having their SpO₂ level $> 93\%$. Most of the older adults and senior patients received anticoagulant and glucocorticoid medications. Among all patients, 29% (n = 121) received Hydroxychloroquine and 6% (n = 27) received Ivermectin. More than 95% of these patients receiving these therapies were between 19 and 49 years. Moreover, a negligible number of patients with low SpO₂ level received Hydroxychloroquine (14%, n = 15) and Ivermectin (5%, n = 6) therapies.

The clinical record showed that 7.43% of the patients (n = 31) received antiviral medications. Only ten patients received injectable Remdesivir, and 21 patients received oral antiviral Favipiravir therapy. Among other drugs, four patients received Convalescent Plasma therapy, and three patients received injectable Tocilizumab (Interleukin-6 inhibitor).

3.4 Clinical outcomes and persistent complications

The median duration of hospital stay for the patients was 12 days; mean 12.36 days, standard deviation [SD] 6.51 days, and range 1 to 32 days. Across the age groups, significant variability of hospitalization duration ($P = 0.012$) (Figure 4). While the elderly patients (59+ years) had the most variability of hospital stay (S.D. = 7.30-day, range 1 to 31), their average hospitalization duration was 11 days. In contrast, younger patients (19-24 years) had, on average, the most prolonged hospital stay (mean 14.11 days, SD 5.92, and range 3 to 27 days).

More than 90% ($n = 381$) patients successfully weaned from SARS-CoV-2 infection (Table 1). During their hospital stay, 13 patients (3%) died due to COVID-19, 18 patients (4%) were referred out to other facilities, and eight patients (2%) were discharged voluntarily after signing risk bonds. After discharge, the hospital was able to conduct a teleconsultation to follow up on 399 patients. An additional eight deaths (2%) were reported during the follow-up teleconsultation (Figure 5). The follow-up was conducted on average, 66 days after the discharge of the patients (range 1 to 129 days). Out of 399 patients, 164 patients (41%) reported experiencing complications after hospital discharge. Among them, 84 patients (51%) reported one, 50 reported two (37%), 30 reported three complications (22%).

During the follow-up period, additional eight deaths were reported. The majority of the patients' complications were associated with respiratory systems, consisting of around 62% ($n = 52$) of the first and 44% ($n = 22$) of the second complications. The type of respiratory complications consisted of cough and cold, chest heaviness, shortness of breath, and pain during breathing. Among other frequently reported complications were post-COVID fatigue syndrome, fever, and musculoskeletal pain.

4. Discussion

This retrospective, observational case series study analyzed the clinical and epidemiological characteristics, and outcomes of RT-PCR positive COVID-19 patients admitted in a tertiary hospital in Dhaka, Bangladesh. Among the admitted patients, one-third were female, and one-third were service holders, 17% were healthcare providers and more than half of the patients presented with underlying comorbidity. Significantly, a higher number of male COVID-19 patients presented with diabetes, hypertension, and ischemic heart disease, whereas asthma was significantly prevalent among women patients. Several meta-analyses also indicated a higher disease burden of COVID-19 among male smokers and patients with comorbid conditions such as cardiovascular disease, hypertension, and diabetes [24–26]. Around 9.35% of patients included in this study were asymptomatic during the initial assessment. Fever and respiratory symptoms were most common among the patients, reported in numerous other studies [21,27,28]. While several studies from China [28,29], Uzbekistan [30], and Brazil [31] reported weakness or fatigue as a common symptom, only 8% ($n = 31$ out of 377) of the patients reported that they experienced weakness during initial triage at the hospital.

Our result showed a SpO₂ level of more than 36% (110 out of 304) hospitalized patients dropped below 94% – which is an indicator of severe illness [32,33]. The lower SpO₂ level or severe illness was significantly associated with older age and the presence of any comorbidity. Besides, the severe illness was significantly associated with radiological findings of Pneumonia [34], higher creatinine [27,35], c-reactive protein [20,35], and Neutrophil Lymphocyte ratio [36–38]. A higher proportion of patients with low SpO₂ levels frequently received antibiotics, anticoagulants, and glucocorticoid therapy.

Among the patient pool, a total of 21 deaths were reported – 13 during the hospitalization period. Eight deaths were reported after discharge, which resulted in a total case-fatality ratio of 5.45% (21 out of 422), which is significantly higher than the national average case-fatality ratio of Bangladesh which is 1.47% [39]. We followed up with 399 patients to investigate their post-discharge complications, and around 41.10% reported at least one complication. Respiratory complications were reported most frequently as persistent symptoms after discharge [40]. Approximately, 31% of patients reported post-COVID fatigue syndrome as complications reported during the telemedicine consultation. Similar to other post-viral infections that cause Chronic Fatigue Syndrome (similar to Myalgic Encephalomyelitis), prolonged fatigue is commonly reported after COVID-19 infection [41,42].

Using a comprehensive set of medical records is the core strength of the study. The clinical and follow-up data quality originated from the tertiary care hospital is exceptionally vigorous, making our result robust and reliable. However, we have to acknowledge a few limitations of this study. First, the result of this study cannot be generalized for the national context of Bangladesh. We have included confirmed COVID-19 cases admitted to the hospital, which can result in selection bias. It is also indicated by the high level of case-fatality ratio identified in the study [43]. Generally, more severe cases of COVID-19 were admitted to the hospital, which resulted from a non-randomized nature of sample recruitment in our study due to the sampling bias [44]. However, we are not exploring any inferential statistics – just defining feature of COVID-19 cases – the selection bias is inconsequential for our study. Secondly, the completeness

of the data is a common complication while using medical records [45]. We decided not to impute any data point to account for the missingness. Instead, we wanted to be transparent [46] and explicitly report the data's missingness for each study component (Figure 1).

5. Conclusion

In conclusion, the clinical and epidemiological characteristics and health outcomes of COVID-19 patients are significantly different across the patients' age groups and gender. Our study has also identified several significant associations with SpO2 level and several patient attributes, hematological correlations, and medication regimen. While we recommend multicenter studies with a larger patient cohort, this study has broken new ground in Bangladesh for clinical research on COVID-19. The result of this study will inform clinicians, public health researchers, and policymakers regarding the nature of COVID-19 in Dhaka, Bangladesh, which became an epicenter of the pandemic.

6. Declarations

Acknowledgments:

We want to acknowledge the Director of the Maternal and Child Health Training Institute (MCHTI), Dr. Md. Shamsul Karim for his invaluable assistance. We also thank the health care providers of MCHTI for their dedication and relentless determination to deliver care to the patients infected with SARS-CoV-2. Lastly, we humbly acknowledge the patients admitted to the MCHTI hospital. Without their information, this paper could not be developed.

6.1 Funding

No funding was received for conducting this study.

6.2 Conflicts of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

6.3 Availability of data and material

The data supporting the finding of this study will be made available to any qualified researcher by the authors upon reasonable request.

6.4 Ethical Review

The institutional review board of the James P. Grant School of Public Health, BRAC University, has provided the ethical approval of the study protocol (Ref. No: IRB-7 December'20-054).

6.5 Authors' contributions

All authors of this study contributed to the design and conceptualization. Establishing institutional collaboration and data acquisition was led by Nirmol Kumar Biswas, Juli Chowdhury, and Ahmad Monjurul Aziz. The analytical plan was developed collaboratively by Md Zabir Hasan and Malabika Sarker. The Analysis was performed by Md Zabir Hasan. The first draft of the manuscript was prepared by Md Zabir Hasan with the support of Shams Shabab Haider and with the supervision of Malabika Sarker and Nirmol Kumar Biswas. All authors reviewed the content of the manuscript and provided their critical comments. The final version of the manuscript was read approved by all authors.

References

1. World Health Organization. COVID-19 Weekly Epidemiological Update [Internet]. World Health Organization; 2020 Dec. Available from: file:///C:/Users/admin/Downloads/20201222_Weekly_Epi_Update_19.pdf
2. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet*. Elsevier; 2020;395:507–13.

3. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. 2020;323:1061–9.
4. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497–506.
5. Pan D, Sze S, Minhas JS, Bangash MN, Pareek N, Divall P, et al. The impact of ethnicity on clinical outcomes in COVID-19: A systematic review. *EClinicalMedicine* [Internet]. Elsevier; 2020 [cited 2020 Dec 28];23. Available from: [https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(20\)30148-6/abstract](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(20)30148-6/abstract)
6. Lai C-C, Shih T-P, Ko W-C, Tang H-J, Hsueh P-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents*. 2020;55:105924.
7. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. *New England Journal of Medicine*. Massachusetts Medical Society; 2020;382:1199–207.
8. Gerli AG, Centanni S, Miozzo MR, Virchow JC, Sotgiu G, Canonica G.W., et al. COVID-19 mortality rates in the European Union, Switzerland, and the U.K.: effect of timeliness, lockdown rigidity, and population density. *Minerva Med*. 2020;111:308–14.
9. Kadi N, Khelfaoui M. Population density, a factor in the spread of COVID-19 in Algeria: statistic study. *Bull Natl Res Cent*. 2020;44:138.
10. Diao Y, Koder S, Anzai D, Gomez-Tames J, Rashed EA, Hirata A. Influence of population density, temperature, and absolute humidity on spread and decay durations of COVID-19: A comparative study of scenarios in China, England, Germany, and Japan. *One Health*. 2021;12:100203.
11. Arif M, Sengupta S. Nexus between population density and novel coronavirus (COVID-19) pandemic in the south Indian states: A geo-statistical approach. *Environ Dev Sustain*. 2020;1–29.
12. Islam S, Mannan F, Islam T, Rahman S, Liza SS, Chisti M.J., et al. COVID-19 Pandemic: How is Bangladesh coping with the rapid spread of coronavirus infection? *J Infect Dev Ctries*. 2020;14:1098–105.
13. Anwar S, Nasrullah M, Hosen M.J. COVID-19 and Bangladesh: Challenges and How to Address Them. *Front Public Health* [Internet]. Frontiers; 2020 [cited 2020 Dec 29];8. Available from: <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00154/full>
14. Shammi M, Bodrud-Doza Md, Islam ARMdT, Rahman MdM. Strategic assessment of COVID-19 pandemic in Bangladesh: comparative lockdown scenario analysis, public perception, and management for sustainability. *Environ Dev Sustain*. 2020;1–44.
15. Rahman MdR, Islam AHMH, Islam MdN. Geospatial modelling on the spread and dynamics of 154 day outbreak of the novel coronavirus (COVID-19) pandemic in Bangladesh towards vulnerability zoning and management approaches. *Model Earth Syst Environ*. 2020;1–29.
16. World Health Organization. Coronavirus disease (COVID-2019) Bangladesh situation reports [Internet]. World Health Organization. 2020 [cited 2020 Dec 29]. Available from: [https://www.who.int/bangladesh/emergencies/coronavirus-disease-\(covid-19\)-update/coronavirus-disease-\(covid-2019\)-bangladesh-situation-reports](https://www.who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update/coronavirus-disease-(covid-2019)-bangladesh-situation-reports)
17. Biswas RK, Huq S, Afiaz A, Khan HTA. A systematic assessment on COVID-19 preparedness and transition strategy in Bangladesh. *J Eval Clin Pract* [Internet]. 2020 [cited 2020 Dec 29]; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7461018/>
18. Banik R, Rahman M, Sikder T, Gozal D. COVID-19 in Bangladesh: public awareness and insufficient health facilities remain key challenges. *Public Health*. 2020;183:50–1.
19. Hassan MdZ, Monjur MR, Styczynski AR, Rahman M, Banu S. Protecting frontline healthcare workers should be the top priority in low-resource health systems: Bangladesh and COVID-19. *Infect Control Hosp Epidemiol*. 2020;1–2.
20. Khan MH, Islam A, Chowdhury MA, Khan MN, Rahman MM, Rayhan, et al. Demographic and Clinical Presentation of CoVid19 Patients in Bangladesh- A Single Center Experience. *IOSR Journal of Dental and Medical Sciences*. 2020;19:38–53.
21. Morshed MdS, Mosabbir AA, Chowdhury P, Ashadullah SM, Hossain MS. Clinical manifestations of patients with Coronavirus Disease 2019 (COVID- 19) attending at hospitals in Bangladesh [Internet]. *Infectious Diseases (except HIV/AIDS)*; 2020 Aug. Available from: <http://medrxiv.org/lookup/doi/10.1101/2020.07.30.20165100>
22. StataCorp. Stata Statistical Software: Release 15 [Internet]. College Station, TX: StataCorp LLC; 2017. Available from: <https://www.stata.com/new-in-stata/>

23. R Core Team. R: A Language and Environment for Statistical Computing [Internet]. Vienna, Austria; 2018 [cited 2018 Jun 12]. Available from: <https://www.r-project.org/>
24. Emami A, Javanmardi F, Pirbonyeh N, Akbari A. Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. *Arch Acad Emerg Med* [Internet]. 2020 [cited 2020 Dec 29];8. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7096724/>
25. Noor FM, Islam MdM. Prevalence and Associated Risk Factors of Mortality Among COVID-19 Patients: A Meta-Analysis. *J Community Health*. 2020;1–13.
26. Fang X, Li S, Yu H, Wang P, Zhang Y, Chen Z, et al. Epidemiological, comorbidity factors with severity and prognosis of COVID-19: a systematic review and meta-analysis. *Aging (Albany NY)*. 2020;12:12493–503.
27. Xu Y, Xu Z, Liu X, Cai L, Zheng H, Huang Y, et al. Clinical Findings of COVID-19 Patients Admitted to Intensive Care Units in Guangdong Province, China: A Multicenter, Retrospective, Observational Study. *Front Med (Lausanne)* [Internet]. 2020 [cited 2020 Nov 25];7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7604321/>
28. Wan S, Xiang Y, Fang W, Zheng Y, Li B, Hu Y, et al. Clinical features and treatment of COVID-19 patients in northeast Chongqing. *J Med Virol* [Internet]. 2020 [cited 2020 Nov 25]; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7228368/>
29. Li L-Q, Huang T, Wang Y-Q, Wang Z-P, Liang Y, Huang T-B, et al. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. *J Med Virol*. 2020;92:577–83.
30. Kim K, Choi JW, Moon J, Akilov H, Tuychiev L, Rakhimov B, et al. Clinical Features of COVID-19 in Uzbekistan. *J Korean Med Sci*. 2020;35:e404.
31. de Moura DTH, Proença IM, McCarty TR, Sagae VMT, Ribeiro IB, de Oliveira GHP, et al. Gastrointestinal Manifestations and Associated Health Outcomes of COVID-19: A Brazilian Experience From the Largest South American Public Hospital. *Clinics (Sao Paulo)* [Internet]. 2020 [cited 2020 Dec 29];75. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7561063/>
32. Grein J, Ohmagari N, Shin D, Diaz G, Asperges E, Castagna A, et al. Compassionate Use of Remdesivir for Patients with Severe Covid-19. *N Engl J Med* [Internet]. 2020 [cited 2020 Dec 29]; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7169476/>
33. Shenoy N, Luchtel R, Gulani P. Considerations for target oxygen saturation in COVID-19 patients: are we under-shooting? *BMC Medicine*. 2020;18:260.
34. Cozzi D, Albanesi M, Cavigli E, Moroni C, Bindi A, Luvarà S, et al. Chest X-ray in new Coronavirus Disease 2019 (COVID-19) infection: findings and correlation with clinical outcome. *Radiol Med*. 2020;125:730–7.
35. Chen C, Chen C, Yan JT, Zhou N, Zhao JP, Wang DW. [Analysis of myocardial injury in patients with COVID-19 and association between concomitant cardiovascular diseases and severity of COVID-19]. *Zhonghua Xin Xue Guan Bing Za Zhi*. 2020;48:567–71.
36. Terpos E, Ntanasios-Stathopoulos I, Elalamy I, Kastiris E, Sergentanis TN, Politou M, et al. Hematological findings and complications of COVID-19. *Am J Hematol*. 2020;95:834–47.
37. Ponti G, Maccaferri M, Ruini C, Tomasi A, Ozben T. Biomarkers associated with COVID-19 disease progression. *Crit Rev Clin Lab Sci*. 2020;1–11.
38. Nalbant A, Kaya T, Varim C, Yaylaci S, Tamer A, Cinemre H. Can the neutrophil/lymphocyte ratio (NLR) have a role in the diagnosis of coronavirus 2019 disease (COVID-19)? *Rev Assoc Med Bras (1992)*. 2020;66:746–51.
39. Johns Hopkins University. Coronavirus Resource Center [Internet]. Johns Hopkins Coronavirus Resource Center. 2020 [cited 2020 Jun 18]. Available from: <https://coronavirus.jhu.edu/>
40. Tenforde MW. Symptom Duration and Risk Factors for Delayed Return to Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Network — United States, March–June 2020. *MMWR Morb Mortal Wkly Rep* [Internet]. 2020 [cited 2020 Dec 29];69. Available from: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6930e1.htm>
41. Islam MF, Cotler J, Jason LA. Post-viral fatigue and COVID-19: lessons from past epidemics. *Fatigue: Biomedicine, Health & Behavior*. 2020;8:61–9.
42. Perrin R, Riste L, Hann M, Walther A, Mukherjee A, Heald A. Into the looking glass: Post-viral syndrome post COVID-19. *Med Hypotheses*. 2020;144:110055.
43. Quinn RR, Hux JE, Oliver MJ, Austin PC, Tonelli M, Laupacis A. Selection Bias Explains Apparent Differential Mortality between Dialysis Modalities. *JASN. American Society of Nephrology*; 2011;22:1534–42.

44. Tripepi G, Jager KJ, Dekker FW, Zoccali C. Selection Bias and Information Bias in Clinical Research. NEC. Karger Publishers; 2010;115:c94–9.
45. Hong CJ, Kaur MN, Farrokhyar F, Thoma A. Accuracy and completeness of electronic medical records obtained from referring physicians in a Hamilton, Ontario, plastic surgery practice: A prospective feasibility study. *Plast Surg (Oakv)*. 2015;23:48–50.
46. Hollestein LM, Carpenter J.R. Missing data in clinical research: an integrated approach. *British Journal of Dermatology*. 2017;177:1463–5.

Tables

Table 1: Characteristics of the COVID-19 positive patients disaggregated by their gender

Patient's Characteristics (Reported Sample Size)	Male (n = 271)	Female (n = 150)		All Patients (n = 421)
	N (Col%)	N (Col%)	P-values	N (Col%)
Patient Age Category in Years (n = 420)				
Less than 19 Years	7 (2.59)	9 (6.00)	0.478	16 (3.81)
19-24 Years	30 (11.11)	17 (11.33)		47 (11.19)
25-34 Years	71 (26.30)	43 (28.67)		114 (27.14)
35-49 Years	80 (29.63)	40 (26.67)		120 (28.57)
50-59 Years	41 (15.19)	24 (16.00)		65 (15.48)
More than 59 Years	41 (15.19)	17 (11.33)		58 (13.81)
Patient Occupation (n = 415)				
Wage Earner	12 (4.53)	4 (2.67)	< 0.001	16 (3.86)
Business	51 (19.25)	1 (0.67)		52 (12.53)
Service	131 (49.43)	28 (18.67)		159 (38.31)
Healthcare Worker	31 (11.70)	40 (26.67)		71 (17.11)
Housewife	0 (0.00)	62 (41.33)		62 (14.94)
Student	18 (6.79)	12 (8.00)		30 (7.23)
Unemployed	22 (8.30)	3 (2.00)		25 (6.02)
Monthly Income in BDT (n = 411)				
5,000-10,000	138 (52.87)	70 (46.67)	0.409	208 (50.61)
10,000-30,000	76 (29.12)	45 (30.00)		121 (29.44)
30,000-50,000	12 (4.60)	12 (8.00)		24 (5.84)
More than 50,0000	35 (13.41)	23 (15.33)		58 (14.11)
Smoking Status of Patient (n = 411)				
Non-smoker	206 (78.93)	148 (99.33)	< 0.001	354 (86.34)
Smoker	55 (21.07)	1 (0.67)		56 (13.66)
Presence of Any Comorbidity (n = 412)				
No	149 (57.09)	77 (51.33)	0.259	226 (54.99)
Yes	112 (42.91)	73 (48.67)		185 (45.01)
History of Contact with COVID-19 Case (n = 411)				
No	63 (24.14)	16 (10.67)	< 0.001	79 (19.22)
Yes	85 (32.57)	79 (52.67)		164 (39.90)
Unknown	113 (43.30)	55 (36.67)		168 (40.88)
Duration of Symptoms during Initial Assessment (n = 418)				
Asymptomatic during initial assessment	25 (9.36)	14 (9.33)	0.827	39 (9.35)
1-7 Days	173 (64.79)	104 (69.33)		277 (66.43)
8-14 Days	56 (20.97)	26 (17.33)		82 (19.66)

15-21 Days	9 (3.37)	5 (3.33)		14 (3.36)
More than 21 Days	4 (1.50)	1 (0.67)		5 (1.20)
Outcome of Hospitalization (n = 421)				
Death	10 (3.70)	3 (2.00)	0.681	13 (3.10)
Recovery	242 (89.63)	139 (92.67)		381 (90.71)
Referred to other facilities	13 (4.81)	5 (3.33)		18 (4.29)
Discharge on risk bond	5 (1.85)	3 (2.00)		8 (1.90)
Reported any Complication during Follow-up (n = 399)				
No	154 (61.11)	81 (55.10)	0.239	235 (58.90)
Yes	98 (38.89)	66 (44.90)		164 (41.10)
Note: Col% = Column Percentage				

Table 2: Characteristics of the COVID-19 positive patients disaggregated by their age category

Patient's Characteristics (Reported Sample Size)	< 19 Years	19-24 Years	25-34 Years	35-49 Years	50-59 Years	> 59 Years		All Patients
	(n = 16)	(n = 47)	(n = 114)	(n = 120)	(n = 65)	(n = 58)		(n = 420)
	N (Col%)	N (Col%)	N (Col%)	N (Col%)	N (Col%)	N (Col%)	P-Values	N (Col%)
Patient Gender (n = 420)								
Male	7 (43.75)	30 (63.83)	71 (62.28)	80 (66.67)	41 (63.08)	41 (70.69)	0.478	270 (64.29)
Female	9 (56.25)	17 (36.17)	43 (37.72)	40 (33.33)	24 (36.92)	17 (29.31)		150 (35.71)
Patient Occupation (n = 415)								
Wage Earner	0 (0.00)	1 (2.22)	4 (3.54)	9 (7.63)	2 (3.08)	0 (0.00)	< 0.001	16 (3.86)
Business	0 (0.00)	0 (0)	8 (7.08)	22 (18.64)	12 (18.46)	10 (17.24)		52 (12.53)
Service	0 (0.00)	20 (44.44)	53 (46.90)	50 (42.37)	24 (36.92)	12 (20.69)		159 (38.31)
Healthcare Worker	0 (0.00)	13 (28.89)	32 (28.32)	17 (14.41)	8 (12.31)	1 (1.72)		71 (17.11)
Housewife	0 (0.00)	1 (2.22)	8 (7.08)	20 (16.95)	19 (29.23)	14 (24.14)		62 (14.94)
Student	14 (87.50)	9 (20)	7 (6.19)	0 (0.00)	0 (0.00)	0 (0.00)		30 (7.23)
Unemployed	2 (12.50)	1 (2.22)	1 (0.88)	0 (0.00)	0 (0.00)	21 (36.21)		25 (6.02)
Monthly Income in BDT (n = 411)								
5,000-10,000	5 (31.25)	32 (71.11)	65 (58.56)	64 (54.70)	21 (32.31)	21 (36.84)	< 0.001	208 (50.61)
10,000-30,000	6 (37.50)	3 (6.67)	39 (35.14)	32 (27.35)	21 (32.31)	20 (35.09)		121 (29.44)
30,000-50,000	2 (12.50)	3 (6.67)	4 (3.60)	6 (5.13)	5 (7.69)	4 (7.02)		24 (5.84)
More than 50,0000	3 (18.75)	7 (15.56)	3 (2.70)	15 (12.82)	18 (27.69)	12 (21.05)		58 (14.11)
Smoking Status of Patient (n = 411)								
Non-smoker	16 (100)	38 (84.44)	95 (85.59)	103 (88.03)	57 (87.69)	45 (80.36)	0.440	354 (86.34)
Smoker	0 (0.00)	7 (15.56)	16 (14.41)	14 (11.97)	8 (12.31)	11 (19.64)		56 (13.66)
Presence of Any Comorbidity (n = 412)								
No	15 (93.75)	39 (86.67)	89 (80.18)	65 (55.56)	10 (15.38)	8 (14.04)	< 0.001	226 (54.99)
Yes	1 (6.25)	6 (13.33)	22 (19.82)	52 (44.44)	55 (84.62)	49 (85.96)		185 (45.01)
History of Contact with COVID-19 Case (n = 411)								

No	3 (18.75)	7 (15.56)	16 (14.41)	28 (23.93)	13 (20.00)	12 (21.05)	0.109	79 (19.22)
Yes	7 (43.75)	18 (40.00)	56 (50.45)	42 (35.90)	28 (43.08)	13 (22.81)		164 (39.90)
Unknown	6 (37.50)	20 (44.44)	39 (35.14)	47 (40.17)	24 (36.92)	32 (56.14)		168 (40.88)
Duration of Symptoms during Initial Assessment (n = 418)								
Asymptomatic during initial assessment	2 (12.50)	11 (23.40)	14 (12.39)	10 (8.47)	1 (1.54)	1 (1.75)	0.005	39 (9.38)
1-7 Days	11 (68.75)	29 (61.70)	75 (66.37)	76 (64.41)	45 (69.23)	40 (70.18)		276 (66.35)
8-14 Days	2 (12.50)	2 (4.26)	20 (17.70)	29 (24.58)	18 (27.69)	11 (19.30)		82 (19.71)
15-21 Days	1 (6.25)	4 (8.51)	3 (2.65)	2 (1.69)	0 (0.00)	4 (7.02)		14 (3.37)
More than 21 Days	0 (0.00)	1 (2.13)	1 (0.88)	1 (0.85)	1 (1.54)	1 (1.75)		5 (1.20)
Outcome of Hospitalization (n = 421)								
Death	1 (6.25)	0 (0)	0 (0)	3 (2.5)	5 (7.69)	4 (6.90)	0.008	13 (3.10)
Recovery	15 (93.75)	46 (97.87)	106 (93.81)	112 (93.33)	56 (86.15)	45 (77.59)		380 (90.69)
Referred to other facilities	0 (0.00)	0 (0)	5 (4.42)	3 (2.5)	2 (3.08)	8 (13.79)		18 (4.30)
Discharge on risk bond	0 (0.00)	1 (2.13)	2 (1.77)	2 (1.67)	2 (3.08)	1 (1.72)		8 (1.91)
Reported any Complication during Follow-up (n = 399)								
No	10 (66.67)	35 (79.55)	73 (65.77)	59 (51.75)	27 (44.26)	31 (57.41)	0.003	235 (58.90)
Yes	5 (33.33)	9 (20.45)	38 (34.23)	55 (48.25)	34 (55.74)	23 (42.59)		164 (41.10)
Note: Col% = Column percentage								

Table 3: Presentation of blood oxygen saturation level (SpO₂: ≤ 93% vs. > 93%) according to their characteristics of the COVID-19 positive patients

Patient's Characteristics (Reported Sample Size)	SpO2 Level ≤ 93%	SpO2 Level > 93%	Patients with reported SpO2	
	(n = 110)	(n = 194)		(n = 304)
	<i>N (Col%)</i>	<i>N (Col%)</i>	<i>P-Values</i>	<i>N (Col%)</i>
Patient Age Category in Years (n = 420)				
Less than 19 Years	2 (1.83)	6 (3.11)	< 0.001	8 (2.65)
19-24 Years	6 (5.50)	16 (8.29)		22 (7.28)
25-34 Years	11 (10.09)	70 (36.27)		81 (26.82)
35-49 Years	27 (24.77)	58 (30.05)		85 (28.15)
50-59 Years	29 (26.61)	26 (13.47)		55 (18.21)
More than 59 Years	34 (31.19)	17 (8.81)		51 (16.89)
Patient Gender (n = 421)				
Male	70 (64.22)	118 (60.82)	0.559	188 (62.05)
Female	39 (35.78)	76 (39.18)		115 (37.95)
Patient Occupation (n = 415)				
Wage Earner	5 (4.59)	8 (4.19)	0.002	13 (4.33)
Business	20 (18.35)	18 (9.42)		38 (12.67)
Service	33 (30.28)	79 (41.36)		112 (37.33)
Healthcare Worker	12 (11.01)	35 (18.32)		47 (15.67)
Housewife	25 (22.94)	26 (13.61)		51 (17.00)
Student	2 (1.83)	16 (8.38)		18 (6.00)
Unemployed	12 (11.01)	9 (4.71)		21 (7.00)
Monthly Income in BDT (n = 411)				
5,000-10,000	50 (45.87)	91 (48.40)	0.886	141 (47.47)
10,000-30,000	35 (32.11)	53 (28.19)		88 (29.63)
30,000-50,000	7 (6.42)	11 (5.85)		18 (6.06)
More than 50,0000	17 (15.60)	33 (17.55)		50 (16.84)
Smoking Status of Patient (n = 411)				
Non-smoker	97 (88.99)	165 (87.77)	0.752	262 (88.22)
Smoker	12 (11.01)	23 (12.23)		35 (11.78)
Presence of Any Comorbidity (n = 412)				
No	34 (30.91)	110 (58.51)	< 0.001	144 (48.32)
Yes	76 (69.09)	78 (41.49)		154 (51.68)
History of Contact with COVID-19 Case (n = 411)				
No	21 (19.27)	36 (19.15)	0.225	57 (19.19)
Yes	35 (32.11)	78 (41.49)		113 (38.05)
Unknown	53 (48.62)	74 (39.36)		127 (42.76)

Duration of Symptoms during Initial Assessment (n = 418)				
Asymptomatic during initial assessment	2 (1.82)	12 (6.25)	0.146	14 (4.64)
1-7 Days	71 (64.55)	132 (68.75)		203 (67.22)
8-14 Days	30 (27.27)	41 (21.35)		71 (23.51)
15-21 Days	4 (3.64)	6 (3.13)		10 (3.31)
More than 21 Days	3 (2.73)	1 (0.52)		4 (1.32)
Outcome of Hospitalization (n = 421)				
Death	9 (8.18)	1 (0.52)	< 0.001	10 (3.30)
Recovery	88 (80.00)	185 (95.85)		273 (90.10)
Referred to other facilities	11 (10.00)	3 (1.55)		14 (4.62)
Discharge on risk bond	2 (1.82)	4 (2.07)		6 (1.98)
Reported any Complication during Follow-up (n = 399)				
No	46 (46.00)	108 (57.75)	0.057	154 (53.66)
Yes	54 (54.00)	79 (42.25)		133 (46.34)
Note: Oxygen saturation above 93% is considered a good prognostic indicator, and a saturation below or equal to 93% is considered poor; Col% = Column percentage				

Table 4: Radiological and laboratory findings of the COVID-19 positive patients during hospitalization and the association with their blood oxygen saturation level measured during the initial examination

Patient's Characteristics (Reported Sample Size)	SpO2 Level	SpO2 Level	All Patients	
	≤ 93%	> 93%		
	(n = 110)	(n = 194)		
	<i>N (Col%)</i>	<i>N (Col%)</i>	<i>P-Values</i>	<i>N (Col%)</i>
X-ray Finding Suggestive of Pneumonia (n = 274)				
Absent	24 (28.24)	96 (72.73)	< 0.001	167 (60.95)
Present	61 (71.76)	36 (27.27)		107 (39.05)
Creatinine Level (n = 258)				
Poor: > 1.2mg/dl	23 (26.44)	16 (12.7)	0.011	53 (20.54)
Good: ≤ 1.2mg/dl	64 (73.56)	110 (87.3)		205 (79.46)
SGPT Level (n = 246)				
Poor: > 40 U/L	49 (59.76)	67 (55.37)	0.536	144 (58.54)
Good: ≤ 40 U/L	33 (40.24)	54 (44.63)		102 (41.46)
C-reactive Protein Test (n = 244)				
Poor: ≥ 6 mg/L	43 (52.44)	38 (31.93)	0.004	90 (36.89)
Good: < 6 mg/L	39 (47.56)	81 (68.07)		154 (63.11)
D-dimer Level (n = 143)				
Poor: > 500 ng/mL	20 (28.99)	9 (15)	0.058	32 (22.38)
Good: ≤ 500 ng/mL	49 (71.01)	51 (85)		111 (77.62)
Blood Hemoglobin Level (n = 87)				
Poor: < 10 gm/dl	11 (40.74)	11 (28.21)	0.288	28 (32.18)
Good: ≥ 10 gm/dl	16 (59.26)	28 (71.79)		59 (67.82)
WBC Total Count (n = 79)				
Poor: < 4000/μL	0 (0)	1 (2.86)	0.404	2 (2.53)
Good: ≥ 4000/μL and <11000/μL	24 (100)	34 (97.14)		77 (97.47)
Neutrophil Lymphocyte Ratio (n = 86)				
Poor: > 3.5	15 (55.56)	6 (15.38)	0.001	25 (29.07)
Good: ≤ 3.5	12 (44.44)	33 (84.62)		61 (70.93)
Monocytes Differential Count (n = 86)				
Poor: > 8%	21 (31.82)	21 (31.82)	0.091	22 (25.58)
Good: 2-8%	45 (68.18)	45 (68.18)		64 (74.42)
Eosinophils Differential Count (n = 86)				
Poor: > 4%	3 (11.11)	4 (10.26)	0.912	8 (9.30)
Good: 1-4%	24 (88.89)	35 (89.74)		78 (90.70)
Platelet Level (n = 71)				

Poor: < 150000/ μ L	2 (9.09)	5 (14.71)	0.535	7 (9.86)
Good: $\geq$ 150000/ μ L	20 (90.91)	29 (85.29)		64 (90.14)
Note: Oxygen saturation above 93% is considered a good prognostic indicator, and a saturation below or equal to 93% is considered poor; Col% = Column percentage				

Table 5: Treatment and medication given to the COVID-19 positive patients during hospitalization disaggregated by their age and their blood oxygen saturation (SpO2) level measured during the initial examination

Age Categories							SpO2 Level				
Treatment and medication given (Reported Sample Size)	< 19 Years	19-24 Years	25-34 Years	35-49 Years	50-59 Years	> 59 Years		≤ 93%	> 93%		All Patients
	(n = 16)	(n = 47)	(n = 114)	(n = 120)	(n = 65)	(n = 58)		(n = 110)	(n = 194)		
	<i>N</i> (Row%)	<i>N</i> (Row%)	<i>N</i> (Row%)	<i>N</i> (Row%)	<i>N</i> (Row%)	<i>N</i> (Row%)	P-values	N (Col%)	N (Col%)	P-values	<i>N</i> (Col%)
Antibiotic (n = 414)											
No	4 (4.21)	10 (10.53)	41 (43.16)	22 (23.16)	9 (9.47)	9 (9.47)	0.006	7 (6.60)	55 (28.50)	< 0.001	96 (23.19)
Yes	12 (3.79)	36 (11.36)	73 (23.03)	97 (30.6)	53 (16.72)	46 (14.51)		99 (93.40)	138 (71.50)		318 (76.81)
Hydroxychloroquine (n = 411)											
No	14 (4.83)	21 (7.24)	73 (25.17)	76 (26.21)	57 (19.66)	49 (16.90)	< 0.001	90 (85.71)	140 (72.54)	0.01	290 (70.56)
Yes	2 (1.68)	25 (21.01)	41 (34.45)	41 (34.45)	5 (4.20)	5 (4.20)		15 (14.29)	53 (27.46)		121 (29.44)
Anticoagulant (n = 413)											
No	12 (6.67)	38 (21.11)	72 (40.00)	47 (26.11)	9 (5.00)	2 (1.11)	< 0.001	14 (13.21)	86 (44.56)	< 0.001	181 (43.83)
Yes	4 (1.73)	8 (3.46)	42 (18.18)	71 (30.74)	53 (22.94)	53 (22.94)		92 (86.79)	107 (55.44)		232 (56.17)
Antiviral (n = 417)											
No	16 (4.14)	46 (11.98)	111 (28.91)	109 (28.39)	54 (14.06)	48 (12.50)	0.002	92 (85.19)	182 (93.81)	0.013	386 (92.57)
Yes	0 (0.00)	0 (0.00)	3 (9.68)	10 (32.26)	9 (29.03)	9 (29.03)		16 (14.81)	12 (6.19)		31 (7.43)
Glucocorticoids (n = 412)											
No	15 (4.66)	40 (12.42)	105 (32.61)	91 (28.26)	43 (13.35)	28 (8.70)	< 0.001	52 (49.52)	164 (84.97)	< 0.001	324 (78.64)
Yes	1 (1.14)	6 (6.82)	9 (10.23)	27 (30.68)	18 (20.45)	27 (30.68)		53 (50.48)	29 (15.03)		88 (21.36)
Oxygen Supplement (n = 413)											
No	10 (6.62)	18 (11.92)	57 (37.75)	43 (28.48)	17 (11.26)	6 (3.97)	< 0.001	1 (0.95)	79 (40.93)	< 0.001	151 (36.56)
Yes	6 (2.31)	27 (10.38)	57 (21.92)	76 (29.23)	45 (17.31)	49 (18.85)		104 (99.05)	114 (59.07)		262 (63.44)
Ivermectin (n = 421)											
No	16 (4.08)	44 (11.22)	106 (27.04)	106 (27.04)	63 (16.07)	57 (14.54)	0.046	104 (94.55)	183 (94.33)	0.937	394 (93.59)
Yes	0 (0.00)	3 (11.11)	8 (29.63)	14 (51.85)	1 (3.70)	1 (3.70)		6 (5.45)	11 (5.67)		27 (6.41)

Others (n = 419)											
No	0 (0.00)	3 (11.11)	8 (29.63)	14 (51.85)	1 (3.70)	1 (3.70)	0.05	6 (5.50)	11 (5.70)	0.944	27 (6.44)
Yes	16 (4.10)	44 (11.28)	106 (27.18)	106 (27.18)	62 (15.9)	56 (14.36)		103 (94.50)	182 (94.30)		392 (93.56)
Note: Row% = Row percentage; Col% = Column percentage, SpO2 = blood oxygen saturation level											

Figures

Figure 1

The sample size of the different component of the study

Figure 2

Distribution of comorbidity among COVID-19 positive patients disaggregated by their gender

Figure 3

Clinical symptoms presented COVID-19 positive patients during the triage

Figure 4

Variability of hospital stay across the age groups

Figure 5

Health complications reported during follow up tele-consultation