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Original Article

Clinical manifestations and socio-demographic status of COVID-19 patients during the second-wave of pandemic: A Bangladeshi experience

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ABSTRACT

Background: Bangladesh is a densely populated country with a substandard healthcare system and a mediocre economic framework. Due to the enormous number of people who have been unaware until now, the development of COVID-19's second-wave infection has become a severe threat. The present investigation aimed to characterize the clinical and socio-demographic characteristics of COVID-19 in Bangladesh.

Methods: A cross-sectional analysis was carried out from all the other COVID-19 patients and confirmed by RT-PCR undergoing a specialized COVID-19 hospital. From March 1 to April 15, 2021, a total of 1326 samples were collected. Samples were only obtained from non-critical COVID-19 patients as critically ill patients required emergency intensive care medications. Then, from April 17 to May 03, 2021, SARS-CoV-2 infection and clinical assessment was performed based on interim guidelines from the WHO. The diagnosis was conducted through RT-PCR. Later, identifying the symptomatic and asymptomatic patient based on checking the Clinical Observation Form (COF). The patients filled the COF form. Finally, statistical analyses were done using the SPSS 20 statistical program.

Results: In this investigation, a total of 326 patients were diagnosed as COVID-19 positive. Among them, approximately 19.02% (n = 62) were asymptomatic, and 80.98% (n = 264) were symptomatic. Here, the finding shows that the occurrence of this infection was varied depending on age, sex, residence, occupation, smoking habit, comorbidities, etc. However, Males (60.12%) were more affected than females (39.88%), and, surprisingly, this pandemic infected both urban and rural residents almost equally (urban = 50.92%; rural = 49.08%). Approximately 19% of the asymptomatic and 62% of symptomatic cases had at least one comorbid disorder. Interestingly, an unexpected result was exhibited in the case of smokers, where non-smokers were more affected than smokers.

Abbreviations: COVID-19, Corona Virus Disease 2019; RT-PCR, Reverse Transcription Polymerase Chain Reaction; SARS-CoV-2, Severe Acute Respiratory Syndrome Coronavirus 2; WHO, World Health Organization.

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The study indicates community transmission of COVID 19, where people were highly infected at their occupations (35.58%), at houses (23.93%) and by traveling (12.88%). Noteworthy, according to this report, a large number (19.33%) of individuals did not know exactly how they were contaminated with SARS-CoV-2. Patients were most commonly treated by an antibiotic 95.09%, followed in second by corticosteroid 46.01%. Anti-viral drugs, remdesivir, and oxygenation are also needed for other patients. Among those, who were being treated, approximately 69.33% were isolated at home, 27.91% were being treated at dedicated COVID-19 hospitals. Finally, 96.63% were discharged without complications, and 0.03% has died.

Conclusion: This investigation concludes that males became more infected than females. Interestingly, both urban and rural people became nearly equally infected. It noticed community transmission of SARS-CoV-2, where people were highly infected at their workplaces. A higher rate of silent transmission indicates that more caution is needed to identify asymptomatic patients. Most of the infected people were isolated at home whereas nearly one-fourth were treated at hospitals. Clinically, antibiotics were the most widely used treatment. However, the majority of the patients were discharged without complications. The current investigation would be helpful to understand the clinical manifestations and socio-demographic situations during the second wave of the COVID-19 pandemic in Bangladesh.

Introduction

An outbreak of 2019-novel coronavirus infection, a disease called the new coronavirus pneumonia (NCP) caused by the SARS-CoV-2, initially referred to as 2019-nCoV and later referred to as COVID-19 by the World Health Organization (WHO) on 11 February 2020 [1], has spread worldwide through human transmission since the first case in December 2019. The World Health Organization (WHO) on 11 March 2020 declared COVID-19 a pandemic [2], pointing to the over 173,482,886 infected cases and 3,731,539 deaths of the coronavirus affliction in over 218 countries and territories around the world till 5th June 2021 and the sustained risk of further global spread through the second-wave of infections (https://www.worldometers.info/coronavirus/).

Experts assume that the second-wave of infections would be more severe than the first wave. Considering the population density, environmental factors, social structure, cultural norms, healthcare capacity, and poverty in Bangladesh, it is certainly hard to lockdown millions of people [3]. Consequently, the appearance of second-wave of infections of COVID-19 in Bangladesh becomes a terrible threat. Currently, there are numerous public health challenges in controlling the spread of COVID-19 in the South Asian region, including Bangladesh. Learning from the first wave of infection of the COVID-19 that was an outbreak in China, there will be a slowdown of economic development with damaged supply chains that impact the public health systems in Bangladesh. Studies have identified that the host receptor for SARS-CoV-2 cell entry is the angiotensin-converting enzyme 2 (ACE 2) [4]. It can trigger respiratory tract infection affecting the upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs). Fever, dry cough, and tiredness are the most common symptoms of COVID-19. Other symptoms included aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, etc. (https://www.webmd.com/lung/features/coronavirus-disease-2019-covid-19). In addition to respiratory symptoms, neurological manifestations [5], Prognosis of liver and gastrointestinal involvement [6], Clinical consequences of cardiovascular involvement in elderly patients [7,8], musculoskeletal [9], and other systematic presentations have also been reported [10]. Furthermore, in histopathological view, lung autopsy of SARS-CoV-2 infected patients, revealed several clinical features like diffuse alveolar damage (DAD), intestinal pneumonia, haemorrhage, oedema, and cardiac damage [11].

Age and presence of comorbidities are the most common underlying factors responsible for the worse outcome of the affected individuals [12,13]. Aging and immunosenescence are complex processes associated with the development of different comorbidities risk factors that exacerbate the Corona Virus Disease 2019 (COVID-19) [14]. The disease is being cured through symptomatic treatment including oxygen therapy and by the immune system. To reduce the risk of transmission in the community, individuals are advised to wear masks in public, wash hands diligently, covering the mouth when coughing, maintaining social distance, monitoring and self-isolation for fourteen days for people who suspect they are infected. Most people (about 80%) recover from the disease without needing hospital treatment. It is important to record essential information and monitor the patients for proper management. Moreover, there is limited coordination among different stakeholders in healthcare management with few policies in place for infection prevention and control (IPC), shortage of testing kits, medical supplies, personal protective equipment, and poor reporting are major challenges to be tackled in case of the COVID-19 [15]. Additionally, poorly screening, negligence of proper lockdown, lower testing rates negatively influences the emergence of second-wave COVID infection in Bangladesh. Furthermore, there is an acute shortage of medical professionals—doctors, nurses, and medical staff members. According to WHO, Bangladesh's doctor-to-patient ratio is 5.26 per 10,000 people, the second-lowest in South Asia (WHO, 2020). In Bangladesh, till 6th June 2021, 809,314 active COVID confirmed cases and 12,801 death cases are recorded (https://www.worldometers.info/coronavirus/country/bangladesh/). Our study traced the emergence of second-wave COVID cases (including daily confirmed and death cases) in Bangladesh starting the countdown from 1st March 2021. The graphical presentation showed confirmed highest cases in the 1st week of April and peaked daily death cases was reported in the middle of April (Fig. 1 and Supplementary data).

In March 2020, Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) originated in China, and immediately after that World Health Organization (WHO) declared a Public Health Emergency of International Concern (PHEIC) [16,17]. After that announcement, SARC-CoV-2 became a pandemic around the world. Since the reported symptoms of the SARS-CoV-2 patients are widely varied between patients: mild to severe, even sometimes asymptomatic, the comprehensive clinical feature is not entirely known yet. Evidence showed that the silent spread of SARS-CoV-2 by these asymptomatic patients while meeting with healthy people without any required precaution has become a significant barrier to control this pandemic [18–20].

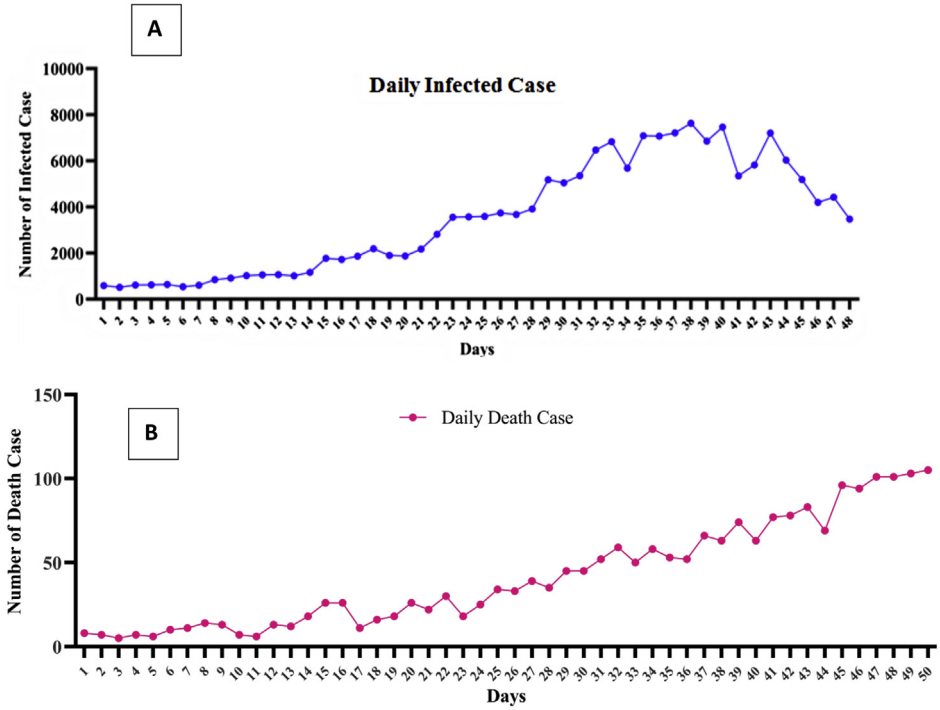

Fig. 1. Emergence of the second-wave COVID-19 infection in Bangladesh. (A) Increased number of daily confirmed cases, (B) increased number of daily death cases.

Thus, to produce effective control measurement against the COVID-19 and to reduce second-wave threat, deep insights of the asymptomatic cases from a wide range of patients and apparent clinical features are inevitable to investigate. Therefore, the present investigation aimed to characterize the clinical manifestations and socio-demographic characteristics of COVID-19 pandemic in Bangladesh.

Materials and methods

Sample collection

A cross-sectional study was carried out from all the other COVID-19 patients and confirmed by Reverse Transcription Polymerase Chain Reaction (RT-PCR) undergoing a specialized COVID-19 hospital (Rajshahi Medical College Hospital) in Rajshahi city of Bangladesh. Samples were only obtained from non-critical COVID-19 patients as critically ill patients required emergency intensive care medications. From March 1 to April 15, 2021, a total of 1316 samples were randomly collected from different Upazilas (Bagha Upazila, Bagmara Upazila, Charghaṭ Upazila, Durgapur Upazila, Godagaṛi Upazila, Mohanpur Upazila, Paba Upazila, Puthia Upazila and Tanore Upazila) of Rajshahi district in the hospital.

Diagnosis

From April 17 to May 03, 2021, SARS-COV-2 infection and clinical assessment was performed based on interim guidelines from the World Health Organization (WHO) [21]. The diagnosis was conducted through Reverse Transcription Polymerase Chain Reaction (RT-PCR), a gold standard technique widely accepted to detect SARS-CoV-2 [22], and finally, a total of 326 patients were identified as COVID-19 positive among 1316 samples. At last, we identified the symptomatic and asymptomatic patients based on checking the Clinical Observation Form (COF) which was filled by the patients themselves. A total of 264 patients were found as symptomatic and 62 were asymptomatic.

Ethics statement

Prior to the commencement of this study, formal ethical approval was obtained from the Ethical Review Committee (ERC) of the Institute of Biological Sciences (IBSc), Rajshahi, Bangladesh (Memo no: IBSc/ERB/2020/0023A). All procedures were carried out in accordance with the Bangladesh declaration.

Data cleaning and analysis

In the current study, descriptive statistical analysis was used to interpret continuous variables as the mean ± standard deviation, and categorical variables as the count (percentage). The Student t-test and Duncan's Multiple Range Test (DMRT) were performed as necessary to test the difference. The data were analyzed using the SPSS 20 statistical program. (SPSS Inc., Chicago, IL, USA).

Results

This present study was performed on a total number of 326 patients by direct visualization. Among them approximately 19.02% (n = 62) were asymptomatic and 80.98% were symptomatic (Fig. 2).

Here, we could try to give here an overview under considering the characteristic features of age, sex, residence, occupation, smoking habit, comorbidities etc. of asymptomatic and symptomatic patients in Table 1. It indicated that the mean age of the evaluation of asymptomatic cases was slightly lower than that of symptomatic cases (35 vs. 37 years; p = 0.004). Males (60.12%), however, were more affected than females (39.88%) and, surprisingly, this pandemic affected both urban and rural residents almost equally (urban = 50.92%; rural 49.08%). The majority of asymptomatic cases were in families where more than four individuals (>4) lived in the same household. Approximately, 19% of the asymptomatic and 62% of symptomatic cases had at least one comorbid disorder. In both cases, diabetes mellitus, hypertension and bronchial asthma were most frequently observed. It should be noted that one of the incredible results was exhibited in case of smokers. Non-smokers

Table 1
Characteristics of patients with COVID-19.

Variables Mean ± SD		Asymptomatic (62) 35.33 ± 13.78	Symptomatic (264) 37.56 ± 15.15	Total (326) 35 ± 14.90	p Value
Age	<20	6 (1.84)	26 (7.98)	32 (9.81)	0.004
	21–30	21 (6.44)	72 (22.09)	93 (28.53)	
	31–40	12 (3.68)	60 (18.40)	72 (22.09)	
	41–50	15 (4.60)	54 (16.56)	69 (21.17)	
	51–60	5 (1.53)	28 (8.59)	33 (10.12)	
	>60	3 (0.92)	24 (7.36)	27 (8.28)	
Sex	Male	37 (11.35)	159 (48.8)	196 (60.12)	0.067
	Female	25 (7.67)	105 (32.21)	130 (39.88)	
Residence	Urban	33 (10.12)	133 (40.80)	166 (50.92)	0.0004
	Rural	29 (8.90)	131 (40.18)	160 (49.08)	
Education	Illiterate	4 (1.23)	26 (7.98)	30 (9.20)	0.018
	Primary	4 (1.23)	27 (8.28)	31 (9.51)	
	SSC	21 (6.44)	87 (26.69)	108 (33.13)	
	HSC	14 (4.29)	53 (16.26)	67 (20.55)	
	Graduation	17 (5.21)	61 (18.71)	78 (23.93)	
	Post-grad	2 (0.61)	10 (3.07)	12 (3.68)	
Income	<15,000	9 (2.76)	36 (11.04)	45 (13.80)	0.194
	15,000–30,000	0 (0)	0 (0)	0 (0)	
	30,000–50,000	29 (8.90)	64 (19.63)	93 (28.53)	
	50,000–75,000	19 (5.83)	41 (12.58)	60 (18.40)	
	>75,000	5 (1.53)	10 (3.07)	15 (4.60)	
Occupation	Unemployed	10 (3.07)	30 (9.20)	40 (12.27)	0.004
	Gov. service	8 (2.45)	35 (10.74)	43 (13.19)	
	Private job	9 (2.76)	49 (15.03)	58 (17.79)	
	Business	18 (5.52)	61 (18.71)	79 (24.23)	
	Day labor	1 (0.31)	9 (2.76)	10 (3.07)	
	Student	5 (1.53)	38 (11.66)	43 (13.19)	
	Housewife	11 (3.37)	42 (12.88)	53 (16.26)	
	Lost job C19	0 (0)	0 (0)	0	
Person living in same house	1	0 (0)	0 (0)		0.200
	2	2 (0.61)	10 (3.07)	12 (3.68)	
	3	7 (2.15)	25 (7.67)	32 (9.82)	
	4	19 (5.83)	76 (23.31)	95 (29.14)	
	>4	34 (10.43)	153 (46.93)	187 (57.36)	
Smoking habit	Smoker	14 (4.29)	54 (16.56)	68 (20.86)	0.333
	Non-smoker	48 (14.72)	210 (64.42)	258 (79.14)	
Comorbidities					
Present		61 (18.71)	202 (61.96)	263 (80.67)	0.316
Absent		1 (0.29)	62 (39.04)	63 (19.33)	
	Diabetes	10 (16.12)	57 (21.59)	67 (20.55)	
	Hypertension	16 (25.80)	49 (18.56)	65 (19.94)	
	Bronchial asthma	13 (20.97)	31 (11.74)	44 (13.50)	
	TB	9 (14.516)	18 (6.818)	27 (8.28)	
	Cardiovascular	7 (11.29)	43 (16.29)	50 (15.43)	
	Kidney	6 (9.677)	4 (1.515)	10 (3.07)	

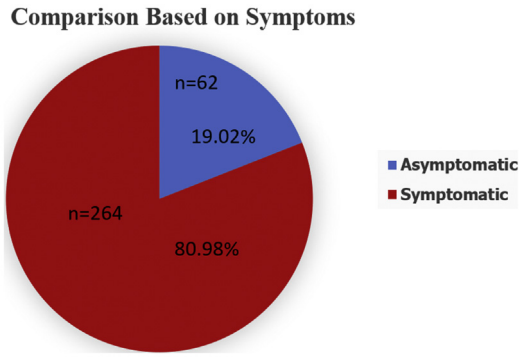

Fig. 2. Proportion of asymptomatic and symptomatic of COVID-19 cases.

were more affected than smokers. Thus, we can assume, it may be feasible that nicotine may has an important effect on decreasing COVID-19. But further test should be conducted. For more details about this consequence the socio demographic profile is shown in the following in Table 1.

Among the symptomatic COVID-19 patients the average duration of illness was twenty days ranging from 6 to 21 days. Fever was most common symptom (80.06%), followed by cough (51.53%), altered smell and test (36.81%), Sore throat (32.21%), headache (19.33%) and breathlessness (18.40%). Intensive care support was warranted in 8.71% of the total cases (23/264). The detailed clinical characteristics of symptomatic patients are presented in Table 2.

The preventive measures taken by COVID-19 patients are listed in Table 3. Proper practice of social distance, wearing face mask, washing hands is always practiced among symptomatic patients (67.18%), (71.78%) and (71.78%) respectively. It clearly indicates that individuals became more conscious after the first wave of infection. Ploughshares, a significant number of people were affected by Severe Acute Respiratory Syndrome (SARS-CoV-2). According to respondents, most of the people were infected at workplace (35.58%), at house (23.93%) and by travelling (12.88%). It indicates that community transmission was involved of transmitting of SARS-CoV-2. Noteworthy, according to this report, a large number (19.33%) of individuals did not know exactly how they were contaminated with SARS-CoV-2.

Management and clinical status of COVID-19 patients are shown in Table 4. Patients were most commonly treated by an antibiotic 95.09%, followed in second by corticosteroid 46.01%.

Anti-viral drugs and remdesivir were taken by 44.17% and 4.60% respectively. Oxygenation was needed in 9.20% of total patients.

Table 2
Clinical characteristics of symptomatic patients (n = 264).

Characteristics		Finding n (%)
	Mean ± SD	20.534 ± 6.835
Duration of illness	<1 week	6 (2.27)
	1–3 weeks	141 (53.41)
	>3 week	117 (44.32)
Symptoms*	Fever	261 (80.06)
	Cough	168 (51.53)
	Chest pain	21 (6.44)
	Breathlessness	60 (18.40)
	Sore throat	105 (32.21)
	Fatigue	42 (12.88)
	Headache	63 (19.33)
	Nausea or vomiting	6 (1.84)
	Runny nose	39 (11.96)
	Diarrhea	24 (7.36)
	Oral ulcer	11 (3.37)
	Conjunctivitis	19 (5.83)
	Myalgia	7 (2.15)
	Altered smell and test	120 (36.81)
	Altered consciousness	9 (2.76)
	Body ache	39 (11.96)
	Others	30 (9.20)
Requirement of ICU	Yes	23 (8.71)
	No	241 (91.29)

'*' Multiple response considers.

Table 3
Scenarios of preventive measures taken by COVID-19 patients.

Variables		Findings N (%)
Social distancing practice	Always	219 (67.18)
	Not always	83 (25.46)
	No	24 (7.36)
Face mask	Always	234 (71.78)
	Not always	74 (22.70)
	No	18 (5.52)
Washing hand	Frequent	234 (71.78)
	Not frequent	68 (20.86)
	No	24 (7.36)
Suspected place of contact	House	78 (23.93)
	Market	27 (8.28)
	Workplace	116 (35.58)
	Mosque	0 (0)
	Travel	42 (12.88)
	Unknown	63 (19.33)

Table 4
Management and clinical status.

Clinical status	Variables	Finding n (%)
Treatment history*	Antibiotics	310 (95.09)
	Remdesivir	15 (4.60)
	Oxygen	30 (9.20)
	Antiviral drug	144 (44.17)
	Corticosteroid	150 (46.01)
Treatment places	Home isolation	226 (69.33)
	Covid-19 hospital	91 (27.91)
	Non Covid-19 hospital	9 (2.76)
Outcome	Discharged without complication	315 (96.63)
	Died	11 (0.03)

Data is expressed as a frequency; '' Means multiple response consider.

Among those, who were being treated approximately 69.33% were isolated at home, 27.91% were being treated at dedicated COVID-19 hospitals and 2.76% were being managed at general hospitals. Finally, 96.63% were discharged without complications and 0.03% was died.

Discussion

In our investigation, we found 19.02% asymptomatic COVID-19 patients, which is closely similar to both Kim et al. (19.2%) and Long et al. (20.8%) study [16]. From Bangladesh, Jahid Hasan et al. found 13.09% asymptomatic COVID-19 patients, while two sequential studies from Lie et al. and Mizumoto et al. found that 29.4% and 34.6% COVID-19 patients were asymptomatic, respectively [23–25]. A meta-analysis by Kronbichler et al. demonstrated that if overall circumstances are taken into account, more than 20% of COVID-19 patients are asymptomatic [26]. Since our study was not a random sample of the entire community, our findings may not be an exact representation of the asymptomatic individual in the overall population. Therefore, population screening may offer a clear representation of asymptomatic infections [27].

We also found that patient's mean age was 35.33 ± 14.90, whereas two other studies from our country reported that the mean age was 36.32 ± 12.36 and 42.59 ± 14.43, respectively [23,28]. Our study participants ranged in age from 20 to 60 years old. Similarly, the Institute of Epidemiology, Disease Control, and Research (IEDCR) indicated that 42% of COVID-19 patients in Bangladesh were between the ages of 21 and 50 [29]. Our analysis observed that 28.53% of COVID-19 patients were between the ages of 21 and 30, which may reflect the busiest part of life, such as when they had to go out for office or business and were primarily infected. A similar study reported that the highest percentage (51.80%) of SARS-CoV-2 infected patients were observed in the 20–40 years old age range [1].

We discovered that the majority of COVID-19 cases (60.12%) were male dominant, similar to the findings of most other research conducted both at home and overseas [30–32]. Comparing MERS-CoV with SARS-CoV, we find that they have similar sex distributions [31,32]. Though our finding showed no significant difference between the symptomatic and asymptomatic groups ($p > 0.05$), it was similar to the previous study of Jahid Hasan et al. [23]. Male domination in COVID-19 instances could be due to gender disparities in testing patients, women's shyness, and a more active male population than the female population in our country, particularly in terms of jobs outside the home. A recent regional demographic investigation showed that males (56.8%) had been infected 13.6% higher than females (43.2%) [1].

Interestingly, the present study found that both urban (50.92%) and rural (49.08%) people were nearly equally infected by this pandemic. However, several past studies showed that urban people were more vulnerable to COVID-19 than rural people due to the population density of the urban area [33,34]. Ali et al. reported recently that the prevalence of COVID-19 infected patients is clearly higher in urban areas (52.7%) than in rural areas (47.3%) [1]. We found that asymptomatic cases were reasonably higher in the house where more than 4 people lived together. However, total symptomatic cases (62%) outstripped asymptomatic cases (19%) by approximately threefold in our investigation. At least one comorbid was found in both the asymptomatic and symptomatic groups. Among them, diabetes, hypertension, and bronchial asthma were the most common in both groups. Previously, one study from Iran showed that diabetes (16.3%) and cardiovascular disorder (21%) were the most frequent comorbidities among the COVID-19 sufferer. At the same time, research from our country reported that hypertension (19.2%) and bronchial asthma (17.6%) were the two most common co-morbidities [28]. Cardiovascular complication, which includes myocarditis, acute cardiac injury, myocardial injury, arrhythmia, stroke, heart failure, cardiac shock, multisystem inflammatory syndrome, arterial and venous thrombotic events, and coagulopathy, is another common comorbidity [35].

Besides, histopathological investigation of the lungs and brain showed that COVID-19 patients could experience various pulmonary injuries and tissue damage in the brain [36,37].

In our investigation, an unexpected result was found, which suggests that the nonsmoker group of people (79.14%) infected more in proportion than the smoker group (20.86%). However, all the previous study regarding the relationship between smoking and COVID-19 cases showed that smoking exacerbates the COVID-19 infection or increase susceptibility against that disease [38–41]. According to the study of Lee et al., both smoking and nicotine upregulate the ACE-2 gene and effects of pro-inflammatory cytokines, which later worsen the condition for a COVID-19 patient [42]. Perhaps the small number of data set produces an anomalous result like this for us, or nicotine has some unknown function against SARS-CoV-2 which we may not know yet.

We found that the average length of illness among symptomatic cases was 20 days, with a range of 6–21 days. One study previously showed that the incubation period of 97.5% of people, who have COVID-19 symptoms, was around 11.5 days, while others reported that it could be extended to 14 days with a median of 4–5 days [17,43,44]. Among the symptomatic patients, the most frequent presentation in our study was fever (80.06%) followed by cough (51.53%), altered smell and test, sore throat, headache, and breathlessness. These patterns of symptoms are closely similar to several previous studies from both home and abroad. Initial investigation in China found that fever was a dominant symptom, while Rodriguez et al. showed that higher percentages of cough frequency were found in COVID-19 than MERS [23,45–47]. Besides, our investigation found a relatively higher proportion (36.18%) of altered smell and test symptoms, and it could be the second-wave effects of COVID-19.

Earlier research from Huang et al. reported that 32% of COVID-19 patients needed Intensive Care Unit (ICU) admission, while Mondal et al. reported only 2.2% [28,48]. In our study, however, 8.7% of COVID-19 patients needed that ICU. After the first wave of COVID-19, a preventive measure taken by people, certainly in our country, increased as our study suggests that personal social distancing, wear a face mask, and washing hands maintained 67.18%, 71.78%, and 71.88% of people, respectively. Before the second-wave, research from our country showed that only 45.9% of people washed their hands, and 60.2% maintained social distancing [28].

Among the respondents, the highest number of people infected by SARS-CoV-2 from their workplace (35.58%) followed by their house (29.93%), and travel (12.88%). However, one study from South Korea revealed that only 11.8% of people were infected from their households [49]. Interestingly, in this present study, a significant percentage of people (19.33%) affected by COVID-19 from unknown places. A considerable proportion of people affected by unknown sources could indicated that a small amount of testing system and silent transmission still a significant barrier for our country to overcome this pandemic.

Several medications have already been employed because of their trial protocols, despite the fact that our country's COVID-19 clinical treatment guideline is not up to standard [28]. The present study found that a majority portion of COVID-19 patients got antibiotics treatment (95.09%). Corticosteroids ranked second 46.01%, followed by antiviral drugs (44.17%). A majority portion of antibiotics treatment may reflect that against both mild and severe COVID-19 cases, antibiotics worked as a primary drug. Besides, 4.60% of patients were treated with remdesivir — a broad-spectrum antiviral medication. However, one study from our country previously reported that 21.6% percent of people took that treatment [28]. Previous research from our country indicated that 6.8% and 14% of people required oxygen treatment [19,24], while our study found that 9.2% of people needed oxygenation.

Among the respondents, 69.33% of people took isolation at their homes, while 27.91% and 2.76% were admitted to COVID specialized hospitals and non-COVID hospitals. Almost 70% of people isolated during their treatment, which indicated that after the first wave of COVID-19, patients understood the value of proper isolation. We also found that after treatment, 96.63% of people left the hospital without any complication, while the death rate was approximately 0.03%.

Our research has several limitations, as we have collected small-scale data. The participants in this study came from various Upzillas in the Rajshahi District of Bangladesh. Furthermore, the current analysis is not a detailed analysis of Bangladesh's COVID-19 issue. It might be regarded as a regional study of COVID-19's second-wave in the northern part of Bangladesh.

Conclusion

This study demonstrated current clinical manifestations and socio-demographic features of COVID-19 pandemic in Bangladesh. It concludes that Males became more infected by SARS-CoV-2 than females. Interestingly, location whether rural or urban was not the primary factor in distinguishing infection cases. This study noticed community transmission of SARS-CoV-2, where people were highly infected at their occupations. A higher rate of silent transmission indicates that more caution is needed to identify asymptomatic patients. Most of the infected patients were isolated at home whereas one-fourth of them were treated at COVID-19 dedicated hospitals. Clinically, antibiotics were the most widely used treatment, followed by corticosteroids, antiviral medications, remdesivir, and oxygenation. However, the majority of the patients were discharged without complications. Despite several limitations including lack of countrywide investigation, our findings would be helpful to understand the current socio-demographic features and clinical manifestations during the second-wave of COVID-19 pandemic in Bangladesh.

Authors' contributions

MRA, MFH, and MB conceived and developed the concept of the study. The conception and design of this research were made by MRA, MAH, MSR, SK, MFH, MFH, MB, UKA, MMHM, MSR, MSRS and MRH. MAH, MSR, and MRA wrote the draft of the manuscript. MB, SK and MAH analyzed the data. The review of the manuscript was performed by MFH, UKA, MRA, and MB. All authors read and revised the article. MFH and MRA approved the final manuscript and hence worked as a corresponding author.

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Competing interests

None declared.

Ethical approval

Memo no: IBSc/ERB/2020/0023A.

Consent to participate

Yes.

Consent to publication

Yes.

Availability of data and material

All the relevant data are within the manuscript.

Code availability

Not applicable.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.jiph.2021.06.011.

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