Original Research Article

Association of demographic variables in COVID-19 infected patients with their recovery status: A pilot study in Dhaka city

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ABSTRACT

Background: Identifying the relationship between demographical factors with COVID-19 infection could demonstrate some prevention strategies of "possible super-spreaders".

Aims: To evaluate the correlation between recovery and demographic characteristics of COVID-19-infected patients

Materials and Methods: A descriptive type of study to demonstrate the 200 COVID-19 infections with various demographical variables by using a questionnaire. The survey consisted of 64-close ended queries, including a short summary of the study background, purpose, procedures, privacy contract, and knowledgeable consent form.

Statistical Analysis used: For statistical analysis Independent T-test or ANOVA test and SPSS version 25 (IBM, USA) and STATA 15 were used.

Results: The male-female ratio of COVID-19 infected patients is 115:100. 50% of patients have never attended social gatherings before getting COVID-19 infection. Social events were visited by 44% of the participants. 47.24% need hospitalization during the positive period, whereas 52.76% recovered at home. Respondents older than 40 years required oxygen support for recovery ($p < 0.05$). The most common symptoms were loss of smell and taste (53%), headache (48%) body pain (38%), and, fever (33%) in the first-time infection however, these symptoms decreased by Second- and third-time re-infection. Similarly, 20% of patients need oxygen support the first time of infection; it decreased by 10% the second time and 4% the third time. There is a statistically significant difference in the mean recovery time between the people from different professions ($p < 0.05$).

Conclusions: The recovery time of COVID-19 infections is associated with age, profession, and the number of COVID-19 infection times.

1. Introduction

COVID-19, as an RNA virus, was a new type of coronavirus named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). On 31st December 2019, a severe respiratory infection was reported in the Wuhan City of Hubei province, China by the WHO (World Health Organization), and announced this respiratory infection is caused by a novel coronavirus called COVID-19. COVID-19 is a very contagious virus, which can spread speedily

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via close contact with an infected person. To minimize the spread of this infection several preventive measures were recommended by WHO.[1] From 30 December through 11 October year 2021, over 37 million COVID-19 cases and over 1 million deaths have been reported globally.[2] In order to reduce the spread of COVID-19 infection, the majority country of the world imposed social distancing and home quarantine rules as well as including Bangladesh also. In Bangladesh, 1,923,031 people were reported with COVID-19 1,716,066 people were recovered and 28,887 have died since 2019. Person-to-person transmission of COVID-19 in spaces people visited social gatherings, hospitals, health care facilities, and public transport systems were reported, and droplet or airborne transmissions were also identified.[3–5] One meta-analysis study discovered that Young patients more suffered from ear, nose, and throat complications compared to older people, while elderly persons often presented fever, fatigue, and loss of appetite. Moreover, Loss of smell, headache, nasal obstruction and fatigue were more predominant in female patients.[6,7] The most common symptoms were headache, loss of smell, nasal obstruction, cough, asthenia, myalgia, rhinorrhea, gustatory dysfunction, and sore throat. Studies also revealed that COVID-19 infections could spread through asymptomatic individuals. It is expected that the mode of infection, symptoms, recovery and, mortality rate of COVID-19 infection are cordially related to the demographical and physiological variables.[8] Several co-morbidities including heart diseases, diabetes, and hypertension–have been associated with severe illness in COVID-19 and mortality.[9–11] The most vulnerable groups for the poor outcome are patients with Diabetes Mellitus and high blood pressure.[12] An increasing age group was also associated with PCR positivity and the severity of the disease.[13–15]

During the outbreak of COVID-19 in Bangladesh, the demographic characteristics of patients of different professions have been estimated by several studies with a small number of samples. Our descriptive study revealed the data on the clinical and demographic characteristics of 200 patients with COVID-19. The patients and their extracted clinical and demographic data belonged to the COVID-19 infection and death reports in Bangladesh. Therefore, the main objective of this study is to understand the general correlation of COVID-19 infection, symptoms, and recovery percentages with different demographic and physiological variables of infected patients. We also identified the most vulnerable source of infection and most resilient connections to the symptoms and recovery rates, specific focus on Dhaka city.

2. Materials and Methods

The survey consisted of 64-close ended queries, which took about 10 minutes in total to complete. Questions were simple, easy to understand, and very straightforward with options to choose from for answers. The survey included a short summary of the study background, purpose, procedures, privacy contract, and knowledgeable consent form. Pressing on the survey online link focused the participants first on the short study summary and consent agreement.

We conducted a descriptive type of study to demonstrate COVID-19 infections with various demographical variables by using a questionnaire. The study was conducted from January 15th to July 15th, 2021 with 200 COVID-19-positive patients (Patients more than 18 years of age are included in our study) in Bangladesh. COVID-19-infected patients who were willing to participate spontaneously in the study were included. As a community-based sampling survey with COVID-19-positive patients during this quarantine situation was not feasible, therefore some were collected online and some were collected from a face-to-face interview. The authors distributed the survey link to the infected patients via social media and electronic mail and our author also collected data from patients who came to Kurmitola General Hospital, Dhaka to give their samples.

During the informed consent process, survey participants were assured all data would be used only for research purposes and that the data set will not be available to the public. This is an online and verbal survey process. Participants started the survey with a detailed disclaimer part, clearly describing the purpose of the survey. Later on, respondents were asked whether they want to volunteer at the very early stage of the survey. The designated survey questionnaire was displayed in front of them, only when they said 'Yes' to volunteering or the survey (their positive reply is documented in the excel output of google form); otherwise directly got an exemption from the survey if they felt reluctant. In addition, participants could stop participating in the study and could leave the questionnaire at any stage before the submission process and their responses were not saved. The response was saved only by clicking on the "submit" button. In the case of minor consent were taken from their parents. By completing the survey, participants were acknowledging the above approval form demographic information of COVID-19 infected patients was also collected. We also collected medical history and clinical information.

2.1. Statistical analysis

Statistical analysis of the studied variables was performed using SPSS version 25 (IBM, USA) and STATA 15. For the inferential part, p-value less than 0.10 were considered statistically significant.

3. Results

A total of 200 COVID-19-infected patients were stratified by age and sex. Most of the patients were between 40 to 50 years and males were the predominant study subjects (107) 53.5% compared to females (93) 46.5%. The male-female sex ratio among the study population is 115:100. Occupationally, a majority of COVID-19-infected patients were housewives (24%) and businessmen (14.5%). 32% of COVID-19-infected patients were overweight and 59% resembled normal weight, whereas 5.5% of study populations resembled obese. 66.33% of COVID-19 had no history to contact with COVID-19-infected persons. 91.5% of Study populations were infected only once with COVID-19 and 8% of populations were infected twice. After Positive RT PCR (real-time polymerase chain reaction), 91.5% maintained isolation properly however; among the study population, 8.04% doesn't maintain any isolation. Among the respondent family member, 31.6% showed more than two members were positive at a time. Among the respondent, 47.24% need hospitalization during a positive period, whereas 52.76% recovered at home. According to the data, several symptoms were present among all the study groups. Qualitative data of symptoms was summarized in Figure 1.
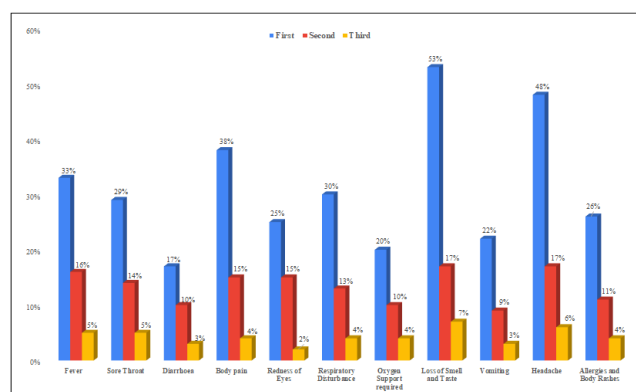

Fig. 1: Prevailed symptoms of COVID-19 infected patients

Patients who were infected with COVID-19 first time appeared with all kinds of symptoms mostly compared to Second and third-time infections. Headache, loss of smell, and taste body pain were common among first-time infected patients. Out of 200 patients (107 male and 97 female), 105 (53%) COVID-19-infected patients lost their taste and smell in first-time infection, in contrast, 33 (17%) patients appeared with these symptoms in second-time infection, and only 13 (7%) patients have resembled these symptoms in third-time infection. Surprisingly, among the study population Symptoms of Diarrhea were less common during the positive period. Only 40 (20%) patients need oxygen support on the first time of infection, in Second-time infection, it was decreased by 20 (10%), wherein for third-

time infection only 7 (4%) patients need Oxygen support.

People of mean-aged mid-30s mostly got information about COVID-19 from social networking sites and television, whereas, people with an average age close to 40 or older 40 got information about COVID-19 from print media (newspapers) or other sources. Moreover, respondents who were older than 40 years required oxygen support for recovery. The average age of the COVID-19 patients who needed oxygen support was 5 years older than the average age of the patients who did not need oxygen support). The average recovery time of the respondents was associated with age, profession, number of infection times, and having fever. Surprisingly, the sample of COVID-19 patients exhibits that the mean recovery time of teenage patients is higher though this age group comprises only 5% of the total sample. Whereas, the mean recovery time of people from other age groups is almost the same either 22 days or 21 days.

There is a statistically significant difference in the mean recovery time between the people from different professions ($p < 0.05$). According to the data the recovery rate of private and medical service persons was lower, which is about 14 days whereas the recovery rate of bankers, business persons, and housewives was more than 20 days. The recovery rate of students and teachers was 23 and 17 days respectively. Out of the several symptoms, the mean recovery time of the COVID-19 patients with fever is higher than the patients with no fever.

4. Discussion

At the time of this study, the spread of COVID-19 in Bangladesh was rising steeply all over the country. We segregated them into four groups and observed people aged between 40 to 50 years were significantly higher proportions compared with the other three age groups. Similar to our study, Datta (2020) found 40 to 50 year individuals are commonly infected and the infection becomes more fatal after the old age of 70 years for both symptomatic & asymptomatic patients. Another analysis revealed that the highest proportion (61%) of individuals developing severe symptoms were aged 50 or above. A few studies specified the age for increased risk as >64.[16–20] 53% of COVID-19 infected patients of our study group lost their taste and smell in first-time infection, in contrast (17%) of patients appeared these symptoms in second-time infection, and only (7%) patients have resembled these symptoms in third-time infection. Among the study population Symptoms of Diarrhea were less common during their infection. Similarly, one study from Europe on mild to moderate patients reported that headache (70.3%), loss of smell (70.2%), and nasal obstruction (67.8%) were the most common symptoms; fever was reported by only 45.4% of patients. Olfactory and gustatory dysfunctions were prevalent symptoms in European patients, but they

Table 1: Participants' characteristics

		Total (N)	Percentage (%)
Demographic characteristics			
Gender	Male	107	53.5
	Female	93	46.5
Age (in years)	0-18	11	5.5
	19-30	38	19
	31-45	90	45
	Above 45	61	30.5
Profession	Banker	21	10.94
	Business	27	14.06
	Government service	20	10.42
	Housewife	47	24.48
	Medical service	10	5.21
	Private Job	23	11.98
	Student	20	10.42
	Teacher	12	6.25
	Others	12	6.25
Weight	Underweight	7	3.5
	Normal	118	59
	Obese	11	5.5
	Overweight	64	32
COVID-19 relevant characteristics			
History of contact with any COVID-19 positive person	Yes	50	25.13
	No	17	8.54
	Not sure	132	66.33
Total no. of times COVID-19 infected	One	183	91.5
	Two	16	8.00
	Three	1	0.5
Maintained Isolation	Yes	183	91.96
	No	16	8.04
Number of COVID-19 positive family members including the respondent	None	23	11.5
	One	55	27.6
	Two	58	29.1
	More than two	63	31.6
Required Hospitalization	Yes	94	47.24
	No	105	52.76
Information sources of COVID-19	Social Networking site	36	18
	Television	17	8.5
	Others sources	16	8.00
	News papers	9	4.5
	WHO, NHS, and other reliable websites	1	0.5
	All mentioned sources	121	60.5
Any death case of a family member due to COVID-19	Yes	25	12.69
	No	172	87.31

were only rarely reported in Chinese patients.[21] The most prevalent symptoms of non-critical COVID-19 patients in Bangladesh consist of 107 fever (78.6%), fatigue (68%), and cough (44.7%). Similarly, in a meta-analysis from China, the most prevalent symptoms were fever (80.4%), cough (63.1%), and fatigue (46%).[22] In our study, (53%) of patients lost their taste and smell in first-time infection, in contrast (17%) of patients appeared with these symptoms the second time, and only (7%) of patients resembled

these symptoms the third time. Where in another study in Bangladesh estimated common symptoms reported were fever (78.6%), weakness (68%), and 94 coughs (44.7%) followed by loss of appetite (37.9%), difficulty in breathing (37.9%), altered 95% of taste or smell (35.0%), headache (32%) and body ache (32%). Less common 96 symptoms included sore throat (28.2%), diarrhea (22.3%), and chest pain (14.6%).[23] Whereas among European people the most common symptoms were headache (70.3%), loss of

Table 2: Relationship between recovery time and demographic characteristics

Variables		Mean	Standard deviation	p-value
Gender	Male	23.043011	9.8697099	0.475
	Female	21.719626	11.54711	
Age (in years)	0-18	26.454545	17.10768	
	19-30	22.921053	14.118	0.066*
	31-45	21.966667	9.8943293	
	Above 45	21.770492	8.1001923	
Weight	Underweight	25.142857	15.104399	
	Normal	22.830508	11.550932	0.313
	Obese	21.46875	9.287248	
	Overweight	2.272727		
Profession	Banker	27.238095	16.118017	
	Business	22.518519	7.4543244	
	Government service	21.4	10.205262	
	Housewife	25.446809	10.339474	
	Medical service	16.2	5.7115867	0.028**
	Teaching	17.75	6.8240884	
	Private Job	18.608696	7.3838837	
	Student	23.45	12.085115	
	Others	24.333333	13.323481	

Source: Author's calculation
** (p value is less than 0.01)

smell (70.2%), nasal obstruction (67.8%), cough (63.2%), asthenia (63.3%), myalgia (62.5%), rhinorrhea (60.1%), gustatory dysfunction (54.2%) and sore throat (52.9%).[24]

One study in Bangladesh reported that the main challenge is a social gathering site for instance market where 66% of patients have a history of visiting the market.[25] However, in our study, we estimated that people who visited social events were predominantly infected about 42%. Surprisingly (need reference), 45% of patients never visited any social gathering site before getting infected with COVID-19 and they maintained proper home quarantine.[26] It's because there is a correlation between age and natural immunity as reviewed elsewhere and concluded that older people are particularly prone to develop more infections as natural immunity declines gradually at older ages. Co-morbidity may also relate to reduced immune function. For example, in diabetic patients, natural immune function is reduced substantially which may restrict the body to produce respective antibodies against any infection. It is found that the prevalence of death of family members was lower in COVID-19, 87.31% of COVID-19 infected patients reported no death cases in their family members.[27] Similarly, the study by Biswas et al, 2021[27] found that the mean prevalence of mortality was significantly lower than survivors associated with COVID-19. Similarly, in the report on multi-sector anticipatory impact and needs analysis, Fatality risks (27-30% of the affected population) of the elderly population is higher than others, because older are more vulnerable to viral infections, including those that induce respiratory disease, resulting in higher morbidity and mortality than younger people. Aging impacts both innate and adaptive arms of the immune system to impair the control of viral infection.[28] Similar to our study, respondents who are older than 40 required oxygen support for recovery during their COVID-19 infection. The average age of the COVID-19 patients who needed oxygen support was 5 years older than the average age of the patients who did not need oxygen support. The results of the single-arm meta-analysis showed that the male took a larger percentage in the gender distribution of COVID-19 patients at 60%, the discharge rate of COVID-19 patients was 52% and the fatality rate was 5%.[29] In the present study, the mean recovery time of teenage patients is higher though this age group comprises only 5% of the total sample. Whereas, the mean recovery time of people from other age groups is almost the same either 22 days or 21 days. The study revealed that there is a statistically significant difference in the mean recovery time between people from different professions (p<0.05). The recovery rate of private and medical service persons was lower, which is about 14 days whereas the recovery rate of bankers, business persons, and housewives was more than 20 days. On the other hand, the recovery rate of students and teachers was 23 and 17 days respectively. All over the world comparison among higher, middle- and lower-income countries found a correlation with recovery rate.[30,31]

Surprisingly, the sample of COVID-19 patients exhibits that the mean recovery time of teenage patients is higher than other age groups, though this age group comprises only 5% of the total sample. This outcome is consistent with a few previous studies (Al-Tammemi 2020; Liu 2020)[6,30] found that teenage people are generally more indifferent about maintaining the required safety measure strictly including social distancing and hygiene practices. Whereas, the mean recovery time of people from other age groups is almost the same either 22 days or 21 days. There is a statistically significant difference in the mean recovery time between the people from different professions ($p<0.05$). The average recovery time of people from medical service, teaching, and private jobs is substantially lower than that of people from other professions. This outcome reveals their positive attitude and responsiveness towards the practices of COVID-19 health measures. According to the survey data, the recovery rate of persons related to medical service, teaching, and private jobs was about two weeks which were around 16, 17 and 18 days respectively, whereas, the recovery rate of bankers, business persons, students, and housewives were more than 20 days. Out of the several symptoms, the mean recovery time of the COVID-19 patients with fever is higher than the patients with other symptoms. The average recovery time of the respondents with mild/moderate/severe fever was on an average three weeks, on the contrary, the average recovery time of the respondents with no fever was less than two weeks.

Our study reports the presenting symptoms of COVID-19 infections among the Bangladeshi population. This study will help both clinicians and epidemiologists to understand the magnitude and clinical spectrum of COVID-19 patients in Bangladesh. We are planning to conduct similar surveys in other regions of the country. Further studies are needed to link our results to previous findings to clarify the role of various factors in the pandemic situation.

5. Conclusion

In conclusion, it can be suggested that the most common symptoms were loss of smell and headache. Respondents more than 40 years of age group both sex group required oxygen support. The mean recovery time of bankers, business persons, and housewives were higher compared to other professions.

6. Source of Funding

7. Conflict of Interest

None.

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