Clinical Practice Article

Evaluation of disease-related characteristics in COVID-19 infected population of Karachi, Pakistan: An online survey

ABSTRACT

Aims: COVID-19 pandemic brought the medical community into action, to introduce a safe and effective strategy to combat the disease. Pakistan has also experienced a significant increase in COVID-positive cases. The objective of this study is to assess the disease-related characteristics and evaluate different treatment responses in patients infected with SARS-CoV-2. Data was collected from January to September 2021.

Methodology: An online survey was circulated and analyzed using SPSS and results were reported as frequency and percentages. 1000 questionnaires were distributed, of which 257 responses were received.

Results: The majority of the population 66.1% survived however, a few 9.7% deaths were reported. Fever (65.7%) and cough (53.6%) were the most frequently observed symptoms. Ninety percent (*n*=230) of the patients required no hospital admission. The results show that 16.3% received anti-viral treatment, mainly Remdesivir. This study will help in assessing the COVID-19 patient's response to different treatment strategies. It will also provide an insight into the psychological impact of COVID-19.

Keywords: COVID-19, Coronavirus, Karachi, Pakistan, Pandemic, SARS-CoV-2

1. INTRODUCTION

COVID-19 initially emerged as pneumonia of unidentified cause in December 2019 in Wuhan, China and now it has been disseminated to various countries [1]. It was declared as the sixth Public Health Emergency of International Concern (PHEIC) by WHO on 30th January 2020 and within a short period of a few months the WHO announced coronavirus as a pandemic, on 11th March 2020 [2]. Despite efforts by WHO and healthcare organizations of different countries to contain the disease, it markedly spread around the globe. As of 4th February 2022, 389,405,917 cases have been reported with 5,733,781 deaths whereas, 308,501,096 have been recovered globally [3].

COVID-19 is caused by the coronavirus strain SARS-CoV-2. This was the third coronavirus outbreak, previously the world has also experienced Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) outbreaks.

Coronavirus is a single-stranded RNA virus belonging to the family *Coronaviridae*. They are divided into four subgroups; α, β, γ, and δ. The β-coronavirus group comprises human pathogens like MERS-CoV, SARS-CoV, and SARS-CoV-2. They are of zoonotic origin and cause severe respiratory illness which can be fatal [4].

It spreads from one person to another through droplets that are produced by coughing or sneezing of the infected person. Taking measures like isolation, hygiene practice and use of personal protective equipment is most effective to reduce the widespread of infection. The incubation period of the virus is estimated to be 4-14 days [5].

Scientific data suggests a wide range of symptoms from asymptomatic to severe. Most of the patients are asymptomatic. Mild to moderate categories of symptoms include fever, dry cough, myalgia, sore throat, runny nose, and digestive symptoms like diarrhea, abdominal pain, nausea, and vomiting. Patients with severe illness exhibit pneumonia-like symptoms with hypoxemia [6]. Complications of COVID-19 affect multiple organs leading to liver injury, myocardial injury, kidney injury, septic shock, respiratory failure, and acute respiratory distress syndrome (ARDS) [7].

There are various methods for the diagnosis of coronavirus, like detection through antibodies and antigen testing. However, today Reverse Transcriptase – Polymerase Chain Reaction (RT-PCR) is considered the gold standard for diagnosing COVID-19, as it is a fast and reliable technique. An antibody test can help in determining the presence and the concentration of immune-globulins (Ig) in blood, serum, or plasma. For this LFA and ELISA techniques are used [8].

Generally, vaccines require many years for development, but this pandemic has brought the medical community into action. Since the beginning of 2020, the process of vaccine development for COVID has been of great concern. To date, various types of vaccines are available that have been developed using different approaches [9]. Major COVID-19 vaccines include Pfizer-BioNTech, Moderna, AstraZeneca, CanSino Bio, and Sinopharm. As of 3 February 2022, 4.1 billion people are fully vaccinated whereas, 10.2 billion doses are administered [10].

Pakistan also observed an intense surge in COVID positive cases since the first coronavirus patient was reported from Karachi on 26th February 2020. On the same day, another case was reported from Islamabad, the capital city of the country. Within 2 weeks there were 20 confirmed cases out of 471 suspected cases. Pakistan health authorities confirmed 4601 cases with 66 deaths till 10th April 2020. The government took several measures to contain this spread [2]. A second wave began in the country by October 28, 2021, however, it was not that severe in transmission and pathogenicity [11]. Delta variant of SARS-CoV-2 was detected in Pakistan and several other countries by July 2021. An intense spike in the number of cases and fatalities was recorded amid the fourth wave[12]. However, as compared to other countries, Pakistan had a mild experience of this pandemic. Recently government confirmed the presence of the new variant B.1.1.529, named Omicron in the country. Initial findings are suggesting Omicron as less severe than Delta variant but more contagious [13].

According to the government of Pakistan, recent figures are as follows; which were updated on 14th February 2022 [14].

Table 1: Pakistan statistics on COVID-19 [14]

Confirmed Cases	Deaths Reported	Recovered Cases
1,486,361	29,801	1,379,921

Table 2: Statistics of coronavirus in Pakistan (province wise) [14]

	Confirmed cases	Mortalities	Recoveries
AJK	41,978	769	39,785
Balochistan	35,096	371	34,428
GB	11,193	189	10,550
Islamabad	133,112	999	126,602
KPK	210,726	6,130	191,330
Punjab	495,430	13,363	472,055
Sindh	558,826	7,980	505,171

This global health crisis has largely affected the mental health of the population. Exposure to such traumatic events creates stress, panic, anxiety, and depression-like symptoms in societies. Like many other developing countries, Pakistan is struggling with mental health issues [15]. The mental health profile of the country shows a stressful image with 6% occurrence of depression, 1-2% epilepsy, and 1.5% schizophrenia. As a whole, 15 million people of Pakistan are suffering from some type of mental illness. However, this recent outbreak has further amplified the incidence of anxiety and depression in the general population [16].

2. METHODOLOGY:

2.1 Study design

A survey-based online study was conducted from December 2020 to September 2021 in Karachi, the city of Pakistan. We opted for this method because population-based surveys are not safe in times of pandemics.

2.2 Target Population

Our target population was male and female patients of any age group, infected with coronavirus (COVID-19). In the case of deceased or severely ill patients, other family members were allowed to fill out the form on behalf of the patient.

2.3 Data collection

The convenience and snowball sampling techniques were used for collecting the data. Social media platforms like WhatsApp were utilized for distributing the survey. Participants were provided with an easy-to-access link to fill out the questionnaire.

2.4 Questionnaire design

The questionnaire was developed using Google Forms and comprised of three sections. The first section included demographic details (age, gender, weight). The second section contained questions relevant to coronavirus infection and the third section involved questions associated with mental health.

2.5 Data analysis

Descriptive analysis was performed to calculate frequencies and percentages. Data were analyzed using Statistical Package for Social Sciences version 20 (IBM SPSS 20).

3. RESULTS:

A total of 1000 questionnaires were distributed. Out of these, 257 responses were received who suffered from coronavirus. The first section of the questionnaire comprised of the demographics and medical history of the patients. Most of the respondents 66.1% (*n*=170), filled the questionnaire on behalf of the family member infected with coronavirus and survived. Although a few 9.7% (*n*=25) responses were representing those who couldn't survive. Most of the population 80.5% (*n*=207) was aged between 15 and 47 years. Out of all respondents, 74.3% (*n*=191) were female and 25.7% (*n*=66) were male. Less than a quarter (21%, *n*=54) of the population was suffering from other diseases. 30% of the population was previously on other medication. Almost 22.6% (*n*=58) of respondents suffer from allergy issues, predominantly dust allergy. More than half of the respondents 54.5% (*n*=140) had a family disease history, primarily diabetes (n=76) and hypertension (n=47). The demographic characteristics and medical history of the population are described in **Table *3***.

Table 3: Demographic characteristics and medical history of the population (N=257)

Variable	Characteristics	Number of participants (*n*)	Percentage (%)
Gender	Male Female	66 191	25.7 74.3
Age	15 – 47 years 48 – 63 years 64 years and above	207 39 11	80.5 15.2 4.3
Weight	Normal Underweight Overweight	204 23 30	79.4 8.9 11.7
Allergy	Yes No	58 199	22.6 77.4
Smoking	Yes No	5 252	1.9 98.1
Surgical History	Yes No	30 227	11.7 88.3
Family disease history	Yes Diabetes Hypertension No	140 76 47 117	54.5 29.5 18.2 45.5

The second section contained questions related to coronavirus infection. The common symptoms experienced by the patients were fever (65.7%, *n*=169) and cough (53.6%, *n*=138) (**Figure 1**).

Around ninety percent (*n*=230) of the patients required no hospital admission for the treatment. The results show that 16.3% (*n*=42) received anti-viral treatment, mainly Remdesivir. Among monoclonal antibodies, most patients received Imdevimab and Bamlanivimab.

Azithromycin was also one of the most common antibiotics used for throat infections experienced by corona patients. Paracetamol was found to be the most cost-effective drug ($P<0.05$) for the management of pain and fever among corona respondents (

Figure *2*).

Out of all, 30 (11.7%) patients were transferred to the ventilator and 35 (13.6%) reported demise due to coronavirus. Further details, related to COVID-19, of the participants are summarized in ***Table 4***.

Table 4: Characteristics related to coronavirus infection

Variable	**Characteristics**	**Number of participants (*n*)**	**Percentage (%)**
Symptoms	Cold	110	42.8
	Fever	169	65.7
	Cough	138	53.6
	Shortness of breath	91	35
	Sore throat	82	31.9
	Muscle pain	112	43
	GI symptoms	11	11
	Loss of taste and smell	18	18
Diagnostic test	RT-PCR	185	72
	Antibody Test	72	28
Treatment	Anti-viral	42	16.3
	Monoclonal Antibody	4	1.6
	Plasma therapy	2	0.8
	None (self-isolation in-home)	209	81.3
Hospital admission required	Yes	27	10.5
	No	230	89.5
Duration of treatment	7 days	27	10.5
	14 days	62	24.1
	20-30	21	8.1
Monoclonal Antibody treatment	None	246	95.7
	Bamlanivimab	4	1.6
	Casirivimab	2	0.8
	Imdevimab	5	1.9
Anti-viral treatment	None	222	86.4
	Remdesivir	29	11.3
	Oseltamivir	6	2.3
Family members infected	None	134	52.1
	1 member	42	16.3
	2 members	24	9.3
	3 members	14	5.4
Transferred to ventilator	Yes	30	11.7
	No	227	88.3

Demise due to COVID-19	Yes No	35 222	13.6 86.4
Most effective drug*	Panadol Antibiotic (Azithromycin) Anti-viral (Remdesivir) None	41 18 14 136	16 7 5.4 52.9
Cost-effective drug*	Panadol Antibiotic (Azithromycin) Anti-viral (Remdesivir) None	38 12 9 164	14.7 4.6 3.5 63.8

*$P < 0.05$ is considered significant

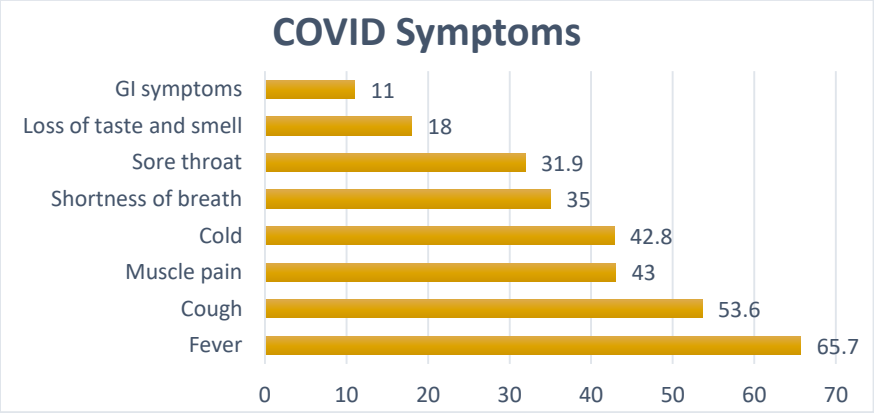

Figure 1: COVID symptoms experienced by Respondents

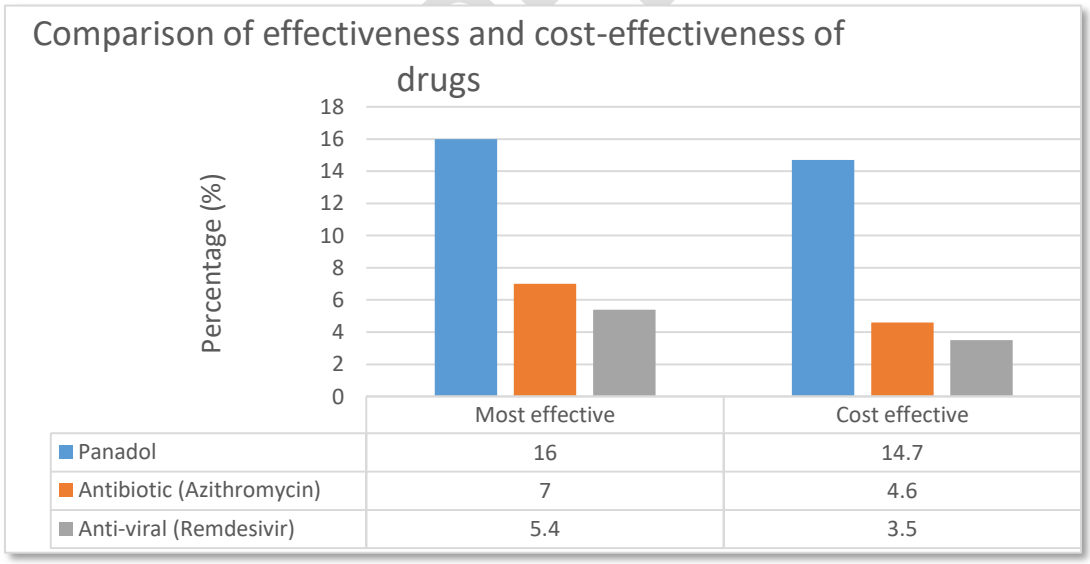

Figure 2 Comparison of effectiveness and cost-effectiveness of drugs

The last section was regarding the mental health condition, details mentioned in

Table 5. The majority of the respondents had no mental health issue, (41.2%, *n*=106) and 37% (*n*=16) had anxiety and depression. Almost half of the population (41%, *n*=106) reported a good mental health state (***Figure 3***).

Table 5: Characteristics related to mental health.

Variable	Characteristics	Number of participants (*n*)	Percentage (%)
Rate your mental health	Excellent	48	18.7
	Good	107	41.2
	Average	87	33.9
	Poor	16	6.2
Diagnosed mental disease	Yes	10	3.9
	No	247	96.1
Mental health problems	None	106	41.2
	Anxiety and depression	16	37
Anti-depressant	Yes	16	6.2
	No	241	93.8
Rate your mental health	Excellent	48	18.7
	Good	107	41.2
	Average	87	33.9
	Poor	16	6.2

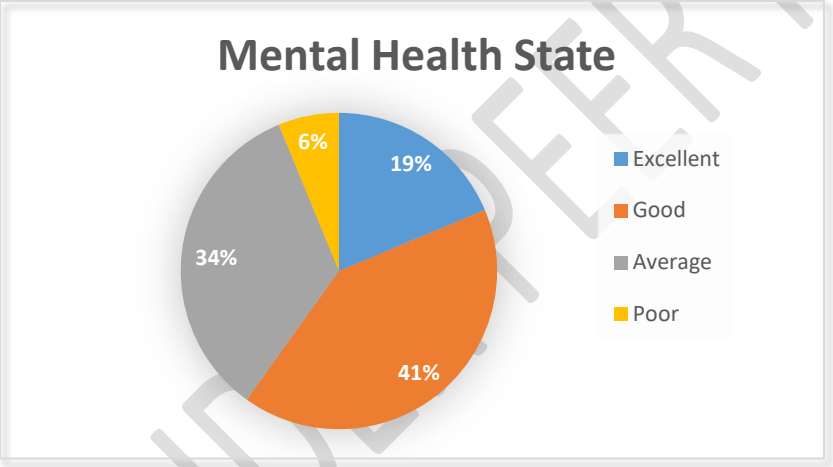

Figure 3: Mental health state of the respondents

4. DISCUSSION:

The Coronavirus pandemic disease (COVID-19) initially emerged in China, as pneumonia of unknown cause and later it spread swiftly across several countries. Currently, this pandemic has gripped the whole world and millions of victims have been reported. Pakistan being an underdeveloped country with a large population, is also facing multiple challenges to cope with the outbreak. This study provides a better understanding of the disease-related characteristics among the Pakistani population infected with COVID-19. Moreover, it also describes the response of patients to different treatment options.

Our results are consistent with existing literature in terms that the majority of patients recovered from Covid-19 and required no hospital admission. This survey revealed that the most affected age group is between 15 and 47 years,

which is parallel to another study conducted on the population of Pakistan [17]. The data also reflects the fact that the country's major population is young with a median age of 22.8 years [18].

Multiple studies have shown that hypertension and diabetes mellitus were the most predominant co-morbidities and a similar pattern is observed in our data [17]. Fever and cough were the most frequently reported symptoms. A meta-analysis of various studies also confirms our results by stating that the aforementioned symptoms are most prevalent in SARS-CoV-2 infected adults [19]. In our study, the median duration of treatment was found to be 14 days, which is comparable with a cohort study conducted in Western Ethiopia. It stated the median time to recovery from Covid-19 was 18 days [20].

Some researches support the use of Remdesivir as it is safe and well-tolerated. It is comparable with our findings because, among patients receiving antiviral therapy, Remdesivir was most frequent [21]. Among prescribed antibiotics, Azithromycin was the most frequent medicine. Although it is bacteriostatic, it also possesses the ability to reduce the viral load. Its effectiveness in treating COVID-19 is controversial. However, a study conducted in Egypt suggests that adding Azithromycin to the therapeutic regimen is beneficial for the early improvement of symptoms (fever and cough) in mild cases [22]. Paracetamol was the most commonly prescribed drug and according to patients, it was most effective in managing symptoms, especially fever [17]. Studies show a poor survival rate in critically ill SARS-CoV-2 patients, especially those on the ventilator. We observed a similar pattern, among the total deaths reported in our data that show 50% of the patients were on ventilator support [23].

The majority of the population had no mental health issues and only a small fraction showed anxiety and depression. These findings are parallel to a study conducted in a different city in Pakistan. They described that in comparison to other parts of the world, COVID-19 related anxiety issues are not much observed in this country [24].

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