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Research Article

Clinical Characteristics of COVID-19 Patients in Gaza Strip during the Pandemic: A Prospective Study

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Abstract

Background: COVID-19, caused by the SARS-CoV-2 virus, is a highly contagious disease that has spread globally since its outbreak in Wuhan, China in late 2019.The pandemic has resulted in millions of confirmed cases and deaths, as well as significant economic and social impacts. The main objective was to assess the clinical characteristics of COVID-19 patients during the peak of COVID-19 pandemic in Gaza Strip.

Methods: This study was a descriptive prospective design. This study was conducted at a main center for COVID-19 inpatients, Turkish-Palestinian Friendship Hospital. The study was conducted during September 2020 to February 2021. Population of this study were COVID-19 patients admitted to Turkish-Palestinian Friendship Hospital. Participants who were intubated or admitted to intensive care unit (ICU) and patients who died during the follow up were excluded from the study.

Results: Among 1235 patients, there were 766 males (62%) and 469 females (38%). The mean age among study participants was 37 ± 14 years and ranged from 16 to 57 years. The prevalence of obesity among study participants was 38.5%. The most frequent symptoms were loss of taste (n = 1148, 92.9%) and loss of smell (n = 1037, 83.9%). Respiratory symptoms included shortness of breath among 283 participants (22.9%) and cough among 783 participants (63.4%). Female gender (OR = 1.35, 95%CI: 0.17 - 2.46, P = 0.035), older age group (OR = 2.67, 95%CI: 1.15 - 2.52, P = 0.010), participants with one comorbid condition (OR = 3.43, 95%CI: 1.8 - 4, P = 0.003) and participants with more than one comorbid conditions (OR = 5.61, 95%CI: 2.41 - 15.17, P < 0.001) all were risk factors for more severe and longer duration of symptoms.

Conclusion: Hospitalized COVID-19 individuals were studied. One third of individuals smoked and had comorbidities such diabetes, hypertension, heart disease, lung illness, and others. Taste and smell loss were the most prevalent COVID-19 symptoms reported by all individuals. Some symptoms developed within days after diagnosis, whereas others came later in the illness and lasted longer. Female gender, older age, and comorbidities increased the intensity and duration of symptoms.

Keywords: *COVID-19; Clinical; Signs; Symptoms; Gaza Strip*

Introduction

The COVID-19 pandemic has affected millions of people across the world and has had a profound impact on public health [1]. One of the most critical aspects of the pandemic is understanding the clinical characteristics of patients infected with the SARS-CoV-2 virus. Clinical characteristics refer to the symptoms, signs, and medical history of patients diagnosed with COVID-19 [2]. These characteristics help medical professionals diagnose and manage patients and also provide valuable information for research purposes [3].

The initial symptoms of COVID-19 are similar to those of the flu, including fever, cough, and shortness of breath [4]. However, some patients may experience more severe symptoms such as pneumonia, acute respiratory distress syndrome (ARDS), and multi-organ failure [5]. In severe cases, COVID-19 can lead to death, especially in older adults and people with underlying health conditions such as heart disease, diabetes, and lung disease [6].

By the end of 2021, Gaza Strip had 51,153 confirmed cases of COVID-19 with 551 total deaths. The active cases at the same time was 11,071 cases and 39,531 recovered cases [7]. Now, in Palestine, the total confirmed cases is 621,008 and a total deaths of 5,404 [8].

In addition to respiratory symptoms, COVID-19 can also cause a range of non-respiratory symptoms such as loss of taste or smell, muscle pain, fatigue, headache, and sore throat [9]. Some patients may also experience gastrointestinal symptoms such as nausea, vomiting, and diarrhea [10]. These symptoms can occur alone or in combination with respiratory symptoms and may persist for a few days or several weeks [11].

One of the most distinctive clinical characteristics of COVID-19 is its rapid progression from mild symptoms to severe respiratory failure [12]. Some patients may experience rapid deterioration within a few days of onset, requiring hospitalization and intensive care. The speed at which the disease progresses can make it difficult for medical professionals to diagnose and manage patients in a timely manner [13].

Another characteristic of COVID-19 is its potential to cause long-term health effects in some patients, even after they have recovered from the acute phase of the disease. This has led to the term "long COVID," which refers to patients who experience symptoms for several weeks or months after initial recovery. These symptoms may include fatigue, muscle pain, and difficulty breathing, among others [14,15].

The clinical characteristics of COVID-19 are diverse and can range from mild to severe. Understanding these characteristics is crucial for the effective management of patients and the development of effective treatment strategies. The current research highlighted the clinical characteristics of COVID-19 patients during the peak of COVID-19 pandemic in Gaza Strip (September 2020 to February 2021).

Methods

Study design

This study was a descriptive prospective design. Since this study aimed to determine the clinical characteristics of COVID-19 patients admitted to the main COVID-19 hospital, data was collected upon patient admission. Furthermore, this design allows to gather much data about participants and follow up the progression or cessation of symptoms.

Study setting

This study was conducted at a main center for COVID-19 inpatients, Turkish-Palestinian Friendship Hospital. This hospital was not operating until the health crisis of COVID-19 in Gaza Strip. The ministry of health decided to make the hospital special place for COVID-19 patients only as other hospitals are full of patients of other diseases. Now, after COVID-19 pandemic, Turkish-Palestinian Friendship Hospital is a specialized center for oncology patients in Gaza Strip. The study was conducted during September 2020 to February 2021.

Study population and sample

Population of this study were all COVID-19 patients admitted to the Turkish-Palestinian Friendship Hospital in the period between September 2020 to February 2021. Three researchers collected data from patients as they were physicians working closely with these patients. Participants who were intubated or admitted to intensive care unit (ICU) and patients who died during the follow up were excluded from the study.

We used G-Power analysis to determine the sample size needed to detect a small-to-medium effect size of 0.25, with an alpha level of 0.05 and 80% statistical power. The analysis indicated that a minimum sample size of 828 participants would be required to achieve these parameters. This informed our decision to recruit a sample of at least 900 participants to account for potential dropouts and missing data. The G Power analysis ensured that our study had adequate power to detect the effect of interest and provided a strong basis for the inferential statistical tests performed on the data.

Study instruments

Study instrument was designed by study researchers based on the findings (signs and symptoms) of patients and based on literature published during the pandemic [16,17]. It consisted of three domains:

1. Sociodemographic characteristics of patients such as age, gender, residency, education, marital status etc.
2. Signs and symptoms with duration, and
3. Medical Management records.

Data collection

Data was collected directly from patients and their records while they were admitted in the hospital. This was done by physicians working closely with these patients.

Data analysis

After collecting data and entering data into the Statistical Package of Social Sciences (SPSS) software version 25, a frequency analysis was done to assure no missing data. In the case of missing data, a case-wise deletion was performed. Once data integrity was achieved, frequency analysis was done to present baseline characteristics variables. Continuous variables were presented as means and standard deviations while categorical variables were presented as frequency and percentages. A statistically significant relationship was assumed at a P value of less than 0.05.

Ethical consideration

An approved permission was gained from Ministry of Health in Gaza Strip to collect data from patients. All Patients in this study were consented to use their data for research purposes.

Results

The study included 1235 patients. Among them there were, 766 males (62%) and 469 females (38%). The mean age among study participants was 37 ± 14 years and ranged from 16 to 57 years. The median age was 39 years. Most of participants were from northern area (n = 713, 57.7%) and Gaza city (n = 376, 30.4%). Figure 1 shows geographical distribution of study participants.

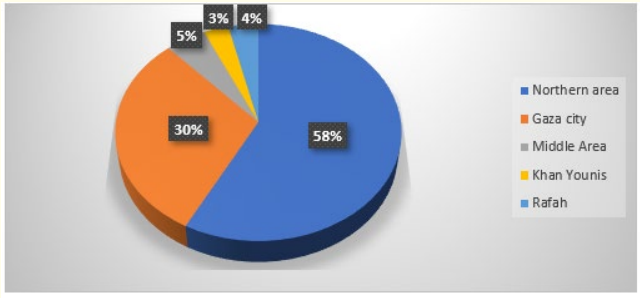

Figure 1: *Geographical distribution of study participants.*

More than half of study participants were married (n = 712, 57.6%) (Figure 2). In addition, about half of participants had a university degree (diploma and bachelor) (n = 602, 48.7%) (Figure 3).

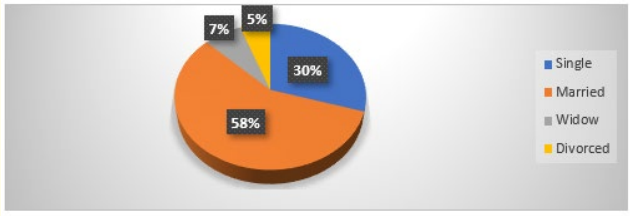

Figure 2: *Marital status distribution of study participants.*

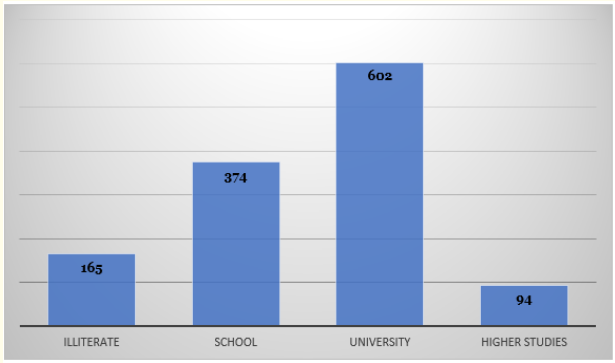

Figure 3: *Educational level distribution of study participants.*

The mean weight among study participants was 74.26 ± 19.91 kg with median weight of 75 kg. The mean height among study participants was 1.66 ± 0.43 meter with median height of 1.69 meter. The median body mass index among study participants was 26.21 kg/m^2. The prevalence of obesity among study participants was 38.5%.

Among study participants, about one third were smokers (n = 406, 32.8%) and 15.7% had comorbid conditions (n = 194). Chronic conditions included diabetes mellitus, hypertension, cardiac disease, respiratory disease and others such as renal and rheumatologic diseases. Table 1 shows frequency of chronic conditions among study participants. Hence, some participants had more than one comorbid condition. And all of participants with chronic conditions are on chronic use of prescribed medications.

Comorbid condition	Frequency	Percent
Diabetes mellitus	68	5.5%
Hypertension	47	3.8%
Cardiovascular disease	46	3.7%
Asthma	79	6.4%
Chronic obstructive pulmonary disease	30	2.4%
Others	37	3%

Table 1: *Comorbid conditions among study participants.*

All participants in the current study exhibited some COVID-19 symptoms. Some patients had one symptom only while others had more than one symptom at once. The onset and duration of symptoms varied among study participants. The most frequent symptoms were loss of taste (n = 1148, 92.9%) and loss of smell (n = 1037, 83.9%). Respiratory symptoms included shortness of breath among 283 participants (22.9%) and cough among 783 participants (63.4%). Non-respiratory symptoms such as diarrhea and abdominal pain were reported by 200 and 131 participants respectively. Figure 4 shows signs and symptoms frequency among participants.

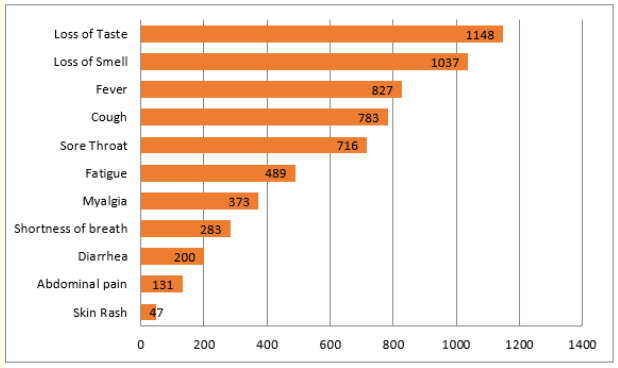

Figure 4: *COVID-19 signs and symptoms among study participants.*

Participants reported that some symptoms appeared in the first day of diagnosis while others during the course of infection. Furthermore, duration of symptoms varied among study participants. Table 2 presents the day of symptom onset while table 3 presents the duration of symptoms.

Signs and symptoms	Onset			
	First 3 days	4th-7th day	8th-10th day	After 10th day
Loss of taste	247	426	474	-
Loss of smell	315	438	284	-
Fever	372	287	168	-
Cough	94	457	194	38
Sore throat	280	117	241	78
Fatigue	124	176	189	-
Myalgia	105	176	92	-
Shortness of breath	37	87	45	114
Diarrhea	20	65	89	26
Abdominal pain	31	73	17	10
Skin rash	19	22	-	6

Table 2: *Onset of signs and symptoms among patients (number of participants).*

Signs and symptoms	Duration			
	1-3 days	4-7 days	8-10 days	> 10 days
Loss of taste	417	219	328	184
Loss of smell	287	536	200	14
Fever	387	341	99	-
Cough	217	368	137	61
Sore throat	76	249	267	124
Fatigue	49	89	268	83
Myalgia	39	147	87	100
Shortness of breath	104	73	48	58
Diarrhea	34	72	65	29
Abdominal pain	25	67	30	9
Skin rash	24	23	-	-

Table 3: *Duration of signs and symptoms among patients (number of participants).*

Patients during their stay in the hospital received various kinds of medications. Table 4 shows the medications used for COVID-19 inpatients in the current study. Patients' hospitalization ranged from 7 to 23 days with median duration of 10 days.

Symptoms severity and duration varied among study participants. Female gender, older age group, participants with one comorbid condition and participants with more than one comorbid conditions all were risk factors for more severe and longer duration of symptoms (Table 5).

Medication/Management	Frequency	Percent
Paracetamol	1020	82.6%
Steroid	378	30.6%
Oxygen	63	5.1%
Vitamin C	699	56.6%
Vitamin D	300	24.3%
Zinc	694	56.2%
Antibiotic (Azithromycin)	573	46.4%
Chest Physiotherapy	773	62.6%

Table 4: *Medication and management approach for COVID-19 patients.*

Risk factor	Odds ratio	95% CI	P
Participants with more than one comorbid condition	5.618	2.41 - 15.17%	<0.001
Participants with one comorbid condition	3.43	1.8 - 4%	0.003
Older age	2.67	1.15 - 2.52%	0.010
Female gender	1.35	0.17 - 2.46%	0.035

Table 5: *Odds ratios, confidence interval (CI), and significant results of factors associated with more severe and longer duration of symptoms from logistic regression analysis.*

Discussion

Patients with COVID-19 who were hospitalized in Turkish-Palestinian Friendship hospital during September 2020 to February 2023, were included in this research. Since certain international research [12-16] imply that being above the age of 50 is a high-risk factor, we felt it was important to draw attention to the occurrence of COVID-19 traits in very young persons, notably in Gaza Strip. Our patients' ages ranged from 16 months to 57 years, suggesting that people of all ages are at risk from COVID-19. However, older age seemed to be a risk factor for more severe and longer duration of symptoms. Male participants were more dominant and this is consistent with the study by Wei., et al. [17]. Most patients in a recent large-scale investigation of the younger population were asymptomatic, had mild sickness, or had a moderate disease that took between [18]. Our research agrees with these others by showing that people of younger ages are not protected from contracting COVID-19. We need to be caution since children with milder symptoms are less likely to seek medical attention. As asymptomatic carriers, they may be more common in the population and aid in the spread of COVID-19.

Patients in this research had a median age of 39 (interquartile range [IQR]: 30-45) years, whereas the median age of patients in earlier studies ranged from 37 to 70.5 years [15,16]. The median age of COVID-19 patients was also 36 years old, which is consistent with the only previous published research of the Saudi population [19]. Researchers in the Middle East found that the average age of their sample group of 63 patients from Oman was 48 ± 16 years [20]. Similar to the published research from China, the United States, and the United Kingdom [15,16,21-24], the majority of our patients were male. SARS-CoV-2 tends to infect adult males, similar to what has been seen for MERS-CoV and SARS [9,25]. Women may be less susceptible to viral infections because of the X chromosome and sex hormones, which act as a barrier (via innate and adaptive immunity) [26]. Nevertheless, women still have more severe symptoms according to our study.

The incubation period for SARS-CoV-2 is 1-14 days, and patients often appear with fever, cough, sputum, and fatigue, according to various studies [15,16,22,27]. Recent reports from Saudi Arabia put the median incubation time for SARS-CoV-2 at 6 days [19]. Cough, fever, and fatigue were among the most often reported symptoms in our research. It is worth noting that Alsofayan., et al. [19] likewise

found that the Saudi population had a high incidence of cough and fever, with the exception of a high frequency of sore throat. Sputum production was a less common symptom in our research cohort, even though it seemed to be rising with age. This may be because, in contrast to previous research [15,16,21-24], all patients in our study were younger than 60 years old. Age did seem to have a role in the prevalence of cough, with the elderly having a slightly higher incidence. Our patients also had gastrointestinal issues such as abdominal pain (n = 131) and diarrhea (n = 200).

Up to 30% of MERS-CoV patients had diarrhea [28,29], and the virus was shown to be able to persist in gastric juice. In both asymptomatic and sick individuals, SARS-CoV-2 has been detected in feces samples [30,31]. It was shown in a recent research that individuals experiencing digestive symptoms were more likely to be fecal virus positive (73.3 percent vs. 14.3 percent, P = 0.033), and with a longer gap between symptom onset and viral clearance (P 0.001) [32]. Patients experiencing gastrointestinal distress should not be ignored, and it may be prudent to check stool samples for viral RNA in an effort to limit the number of misdiagnoses.

Similar to prior research [15,19,20,22,33], we found that hypertension is a prevalent comorbidity among our patients (3.8%). Nevertheless, diabetes mellitus was the most prevalent among our patients (5.5%). Because of the prevalence of hypertension among COVID-19 patients among Italy's dead, constant vigilance is required [34]. On the other hand, our data revealed that hypertensive individuals had less severe symptoms and required less time in the hospital. The cause for this is unknown, since there is very no evidence linking past usage of ACE inhibitors or ARBs to better outcomes in COVID-19 [35]. Docherty., et al. [24] found an extensive patient population in the UK with substantial comorbidities including chronic lung and renal disorders. In addition, 38.5% of our patients were obese, a statistic that was not reported in the most recent assessment of the literature population [19]. Based on information from the United States [36,37], obesity is a major health issue and an under recognized risk factor for COVID-19. Due to factors such as poor breathing due to restricted diaphragmatic and rib movement, impaired immunological response to infections, and increased oxidative stress, young obese COVID-19 patients may be at risk for disease development [38,39].

This study is the first to report clinical characteristics of COVID-19 patients in Gaza Strip during the pandemic peak. Study design, prospective, gives reliable information as data was collected while patients present at the hospital with close follow up. Further research about larger population is recommended. Furthermore, researchers are encouraged to provide data about ICU cases.

Conclusion

The study included patients with COVID-19 symptoms admitted to the hospital. Around one third of the participants were smokers and had comorbid conditions such as diabetes mellitus, hypertension, cardiac disease, respiratory disease and others. All participants reported some symptoms of COVID-19 with the most common one being the loss of taste and smell. Some symptoms appeared within the first few days of diagnosis while others appeared later in the course of the infection and had varying duration. The severity and duration of symptoms varied among participants with factors such as female gender, older age, and having comorbid conditions as risk factors for more severe and longer-lasting symptoms.

Competing Interest

Authors declare that they have no competing interests.

Authors' Contribution

EK designed the study protocol and formulated study design. EK and AT prepared the study instruments. EK gained the ethical approval for the study. SM transformed the instruments into online form. OS, HT and AHK collected the data from patients. SM extracted data from the online form. AT and GM analyzed the data and wrote the first draft of the manuscript. EK revised the manuscript and supervised the overall work during the study. All authors approved the final draft of manuscript.

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Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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