

## Demographic and Clinical Characteristics of COVID-19 Patients

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### ABSTRACT

**Objective:** The COVID-19 disease, which first appeared in Wuhan, China, at the end of 2019, soon affected the whole world. This study aims to examine the relationship between the demographic characteristics and clinical symptoms of COVID-19 patients and mortality rates during the COVID-19 pandemic period.

**Material and Methods:** This retrospective observational study was done on the files of 671 dead or living patients with laboratory-confirmed COVID-19 pneumonia hospitalized in Sinop State Hospital in Turkey from February to September of 2020. The demographic features such as sex, age, and comorbidities such as diabetes, hypertension, etc., and clinical symptoms of the disease such as fever, cough, shortness of breath, respiratory distress, weakness, head rotation, etc., were recorded.

**Results:** The total mean age of the patients was 56.08 years. The most common symptoms were cough, fever, respiratory distress, shortness of breath, and the most common comorbidities were hypertension, diabetes, ischemic heart disease, and COPD. There was a statistically significant difference between the dead and living patients in terms of sex ( $p=0.011$ ,  $EXP(B)=0.429$ ), cough ( $p=0.000$ ,  $EXP(B)=0.137$ ), and respiratory illness ( $p=0.000$ ,  $EXP(B)=15.526$ ). There was a statistically significant difference between the dead and living patients in terms of age, number of additional illness, number of arrival complaint, length of stay in the hospital, intensive care hospitalization period, and number of medications used ( $p$ -values=0.000, 0.040, 0.000, 0.020, 0.030, and 0.000, respectively).

**Conclusion:** As a result of our study, gender, cough, and respiratory tract disease were statistically effective factors for course of illness. In addition, there was a significant difference between living and deceased patients in terms of age, number of additional diseases, number of admission complaints, length of hospital stay, length of stay in the intensive care unit, and number of drugs used. According to these results, it has been concluded that COVID-19 patients with these factors should be followed more carefully.

**Keywords:** COVID-19, Pandemic, Cough, Age, Comorbidities

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### INTRODUCTION

In December 2019, several pneumonia cases without a specified cause were reported in Wuhan, China, where some patients rapidly developed acute respiratory failure or respiratory distress syndrome (1). A novel coronavirus was identified on January 7 by the Chinese Center for Disease Control and Prevention (CDC) from the throat swab sample of a patient, which was named 2019-nCoV by WHO (2) on March 11, 2020, since the global spread of the COVID-19 outbreak reaching 118,319 confirmed cases and 4,292 confirmed deaths (3). The novel coronavirus caused severe respiratory illness similar to the severe acute respiratory syndrome. Most of the patients were male, and several patients suffered from the underlying conditions (4). By May 16, 2020, 4,602,900 cases with 307,135 deaths were confirmed worldwide, and case fatality rate (CFR) defined as 6.67% (5).

COVID-19 has caused several unexplained issues in the early stages leading to complications such as severe pneumonia, acute respiratory distress syndrome (ARDS), multiple organ failure, pulmonary edema, and severe acute respiratory infections in some patients (6).

Besides, COVID-19 adversely affects the mental and physical health of vulnerable people such as elders, children, pregnant women, etc. (7). Elderly patients with COVID-19 and chronic diseases such as type-2 diabetes, cardiovascular diseases, hypertension, malignancies, or chronic obstructive pulmonary disease developed severe acute respiratory syndrome more (8). The patients with a higher risk for ICU admission, type-2 diabetes, and considerable mortality showed a higher incidence and severity of COVID-19 (9).

The coronavirus pandemic has caused a considerable burden on the National Health System all over the world because of the increasing number of patients needing ICU during the limited period and hyperacute outbreak. Therefore, the disease has varying outcomes based on the disease's burden in each country (10). In Turkey, the first case was diagnosed on March 11, 2020, and there was a rapid increase in the number of cases to 670 patients within ten days (11).

Research is needed on this outbreak, which could have affected the world in the past months in Turkey. Identifying the characteristics of patients who died and survived COVID-19 to take adequate preventive measures.

This study aimed to investigate the relationship between clinical and demographic characteristics of patients diagnosed with COVID-19 and morbidity.

## MATERIAL and METHODS

In this retrospective observational study, the files of 671 dead or living patients with laboratory-confirmed COVID-19 pneumonia hospitalized in Ayancık State Hospital ICUs in Turkey from February to September 2020 were included. The demographic features such as sex, age, and accompanying chronic diseases such as diabetes, hypertension, etc. and clinical symptoms of the disease such as fever, cough, shortness of breath, respiratory distress, weakness, head rotation, etc. were recorded. The study was approved by the local academic committee number 7115 and the Turkish Republic dated 12.01.2021. All procedures performed in studies involving human participants were in accordance with the institutional and national research committee's ethical standards, the 1964 Helsinki Declaration, and its later amendments or comparable ethical standards.

Data were collected regarding age, gender, underlying health conditions, such as pulmonary diseases, hypertension, cardiovascular disorders, malignancy, kidney failure, or diabetes. The information about smoking, and vital signs such as heart rate, fever, respiration rate, etc., was recorded. Besides, the data about the number of patients requiring ventilation, the length of stay in hospital and ICU, the number of patients who died, etc., were also recorded.

**Statistical analysis:** The Kolmogorov–Smirnov test has been used to test the normality of the research variables. Considering that the test's significance level related to all variables is above 0.05, the normality of the research variables has been accepted. The binary regression and Mann-Whitney U test were used to examine the relationship between the patients' mortality with the demographics variables, considering the normality and quantitative variables.

## RESULTS

### Demographic and Clinical Characteristics

Of the patients included in the study (n:669), 51.4% were male, and 48.3% were female. Table 1 shows that dead patients (68.6%) were male, and 31.4% dead patients were female. The total number of 49.7% living patients were male, and 49.9% living patients were female.

A total of 86.3% dead patients never smoked, and 13.7% dead patients were old smokers. A total of 86.1% living patients were not smokers, 3.5% patients sometimes smoked, and 5.4% living patients were old smokers. In total, 87.0% were not smokers.

The distribution of chronic diseases, comorbid factors, and clinical characteristics of patients living and dying are shown in **Table-1**.

**Table 2** shows that the mean age of the patients who died was 75.61, the mean age of the surviving patients was 54.55, and the mean age of the patients was 56.08. Information on the presence of additional disease, average admission complaints, length of stay in the hospital and intensive care unit, and the number of drug use of deceased and surviving patients are given in Table 2.

There was a statistically significant difference between dead and living patients in terms of gender ( $p=0.011$ ), cough ( $p=0.000$ ), and respiratory tract disease ( $p=0.000$ ) (Table-3). However, there was no significant difference between dead and living patients in terms of smoking, diabetes, COPD, hypertension, ischemic heart disease, chronic kidney failure, advanced disease, cancer, fever, shortness of breath, weakness, dizziness, and sore throat. Pain, COVID positivity in family, odor, nausea, and headache. Results also showed a statistically significant difference between dead and living patients in terms of age, number of additional diseases, number of complaints, length of hospital stay, length of stay in the intensive care unit, and number of drugs used (respectively;  $p=0.000$ ,  $p=0.040$ ,  $p=0.000$ ,  $p=0.020$ ,  $p=0.030$ , and  $p=0.000$ ). Table 3 shows the significance test of the variables in the study. According to the results, three variables, namely cough, gender, and respiratory distress, significantly affected the mortality of patients with COVID-19.

**Table 1.** Demographics and clinical signs of the sample

Mortality VARIABLE	YES		NO		TOTAL	
	n	%	n	%	n	%
<b>SEX</b>						
MAN	35	68.6	287	49.7	345	51.4
WOMAN	16	31.4	288	49.9	324	48.3
<b>Smoking</b>						
Never smoker	44	86.3	497	86.1	584	87.0
Sometimes smoking	-	-	20	3.5	20	3.0
Old smoker	7	13.7	31	5.4	38	5.7
<b>Comorbidity</b>						
<b>Diabetes</b>						
YES : 1	7	13.7	98	17.0	105	23.0
NO : 0	44	86.3	477	82.7	563	76.6
<b>COPD</b>						
YES : 1	5	9.8	58	10.1	63	9.4
NO : 0	46	90.2	517	89.6	605	90.2
<b>Hypertension</b>						
YES : 1	16	23.9	138	31.4	154	23.0
NO : 0	35	75.7	437	68.6	514	76.6
<b>Ischemic Heart Disease</b>						
YES : 1	11	21.6	66	11.4	77	11.5
NO : 0	40	78.4	509	88.2	591	88.1
<b>Chronic Renal Failure</b>						
YES : 1	1	2.0	8	1.4	9	1.3
NO : 0	50	98.0	567	98.3	659	98.2
<b>Advanced Disease</b>						
YES : 1	2	3.9	14	2.4	16	2.4
NO : 0	49	96.1	561	97.2	652	97.2
<b>Cancer</b>						
YES : 1	3	5.9	12	2.1	15	2.2
NO : 0	48	94.1	563	97.6	653	97.3
<b>Arrival complaint</b>						
<b>Fever</b>						
YES : 1	7	13.7	236	40.9	15	2.2
NO : 0	44	86.3	341	59.1	653	97.3
<b>Cough</b>						
YES : 1	43	84.3	187	32.4	257	38.3
NO : 0	8	15.7	390	67.6	413	61.5
<b>Respiratory distress</b>						
Yes : 1	14	27.5	6	1.0	22	3.3
No : 0	37	72.5	571	99.0	648	96.6
<b>Shortness of breath</b>						
Yes : 1	15	29.4	136	23.6	164	24.4
No : 0	36	70.6	441	76.4	506	75.4
<b>Weakness</b>						
Yes : 1	-	-	32	5.5	32	4.8
No : 0	51	100.0	545	94.5	638	95.1
<b>Head rotation</b>						
Yes : 1	-	-	1	.2	1	.1
No : 0	51	100.0	576	99.8	669	99.7
<b>Sore throat</b>						
Yes : 1	-	-	10	1.7	11	1.6
No : 0	51	100.0	567	98.3	659	98.2
<b>Pain</b>						
Yes : 1	-	-	12	2.1	12	1.8
No : 0	51	100.0	565	97.9	658	98.1
<b>COVID positivity in the family</b>						
Yes : 1	-	-	5	.9	5	.7
No : 0	51	100.0	572	99.1	665	99.1
<b>Odor</b>						
Yes : 1	-	-	1	.2	1	.1
No : 0	51	100.0	576	99.8	669	99.7
<b>Nausea</b>						
Yes : 1	-	-	1	.2	1	.1
No : 0	51	100.0	576	99.8	669	99.7
<b>Headache</b>						
Yes : 1	-	-	2	.3	2	.3
No : 0	51	100.0	575	99.7	668	99.6
<b>Death</b>						
Yes	51	7.6				
No	577	86.0				

**Table 2.** Descriptive variables of the dead and living patients

Mortality VARIABLE	YES		NO		TOTAL	
	min-max	mean(sd)	min-max	mean(sd)	min-max	mean(sd)
Age	1-92	75.61(11.12)	1-99	54.55(21.90)	1-99	56.08(21.93)
Additional illness	0-3	.88(.931)	0-5	.68(1.030)	0-5	.65(1.004)
Arrival complaint	0-2	.86(.693)	0-3	1.44(.800)	0-3	1.40(.798)
Length of stay in the hospital	1-28	8.25(6.820)	1-61	9.66(5.961)	1-61	9.48(5.95)
Intensive care hospitalization period	1-22	7.73(6.052)	1-43	15.52(13.30)	1-43	9.97(9.64)
No. Medications used	1-23	12.06(6.367)	1-44	7.21(4.775)	1-44	7.58(5.008)

**Table 3.** Significance test of the variables to be studied

variable Mortality	p-value	exp(b)
Sex	.011	.429
Smoking	.810	1.062
Diabetes	.162	.508
COPD	.359	.621
Hypertension	.330	1.468
Ischemic heart disease	.072	2.172
Chronic renal failure	.732	1.460
Advanced disease	.473	1.775
Cancer	.089	3.274
Fever	.699	.820
Cough	.000	.137
Respiratory distress	.000	15.526
Shortness of breath	.574	1.232
Weakness	.998	.000
Head rotation	1.000	2.228
Sore throat	.999	.000
Pain	.999	.000
COVID positivity in the family	.999	.000
Odor	1.000	.000
Nausea	1.000	.000
Headache	.999	.171
Age	.000	
No.(additional illness)	.040	
No.(arrival complaint)	.000	
Length of stay in the hospital	.020	
The intensive care hospitalization period	.030	
No. Medications used	.000	

## DISCUSSION

The study aimed to investigate the demographic and clinical features of COVID-19 cases in Turkey to show the relationship between the clinical signs and demographics and morbidity under the pandemic. The study showed that sex, cough, and respiratory illness were associated with higher mortality odds. In other words, those who coughed were at higher risk of death due to COVID-19. Regarding the sex of the patients, the females were at a lower risk of mortality than the males, and those with respiratory distress symptoms were at a lower risk of mortality than those without respiratory distress symptoms. The findings also showed that age, number of additional illnesses, number of arrival complaints, length of stay in the hospital, intensive care hospitalization period, and number of medications used significantly affected the patients' mortality under the pandemic. The older patients increased the mortality risk; those at higher risk of mortality had a more additional illness; those at higher risk of mortality had lower arrival complaints. The living patients had longer stay in the hospital, and the living patients had longer intensive care hospitalization than the dead patients. Dead patients used more medications than living patients.

Altintas et al. (12) found that the length of hospital stay was from 4 to 22 days and the mean duration was 12.3 days, and the pandemic caused more serious complications in the middle-aged and elderly population or those with underlying chronic diseases, which is in line with our study results. Some studies have the mean age of COVID-19 patients from 49 to 56 years of age (13), while our study showed that the mean age was 56.08.

Goshayeshi et al.(5) found that the risk of mortality was enhanced by the rising age, which is in line with our study results. Goshayeshi et al. (5) also found that the most frequent comorbidities were cardiovascular disorders and diabetes, and the most frequent symptoms were fever, dyspnoea, cough, and the age group of 80-89 years had the highest rate of fatality, but fever and cough were not common among the dead patients as compared to those who survived and Zhou et al. (14) also found that increased age was associated with death in patients with COVID-19, which is in line with our study results.

Our study results are not consistent with Halvatsiotis et al. (10), who found a statistically significant improvement of the ratio in patients at the age above 66 years and similar mortality between age study groups.

According to a report of the WHO (15), males had higher Infection rates than females. In our study, 51.4 % were male, which is not consistent with the study by Suleyman et al. (16) who found that more than one-half of cases were women but supported the results of study by Suleyman that male sex and age older than 60 years were significantly associated with mortality. Regarding the hospitalization rate of women under the pandemic, our study results are also consistent with (17-19).

85% of the patients in China declared that they never smoked (20). In our study, 87.0 % of the patients never smoked. Verity et al.(21) have shown an association between the severity of the disease and comorbid diseases. A study in China found a fatality rate of 6.0% in hypertension, 7.3% in diabetes, 10.5% in cardiovascular diseases, 6.3% in chronic respiratory diseases, and 5.6% in cancer cases (22). Aggarwal et al. (23) found that the most common comorbidities among the infected patients were hypertension, congestive heart failure, diabetes, cancer. Lei et al. (24) found that the most common complications in non-survivors included shock, arrhythmia, ARDS, and acute cardiac injury, and the common symptoms were fever, fatigue, and dry cough, and 44.1% of the patients needed ICU, 20.5% died after admission to ICU and those who were in ICU were older, and had underlying comorbidities. Our study found that 13.7% of the dead patients had diabetes, 23.9 % of the dead had hypertension, 21.6% of the dead patients had ischemic heart disease, 9.8% of the deceased patients had COPD, and 5.9% had cancers.

A study which was conducted in Wuhan on patients with COVID-19 pneumonia showed that the most common clinical findings were fatigue in 38%, dry cough in 67%, myalgia in 14.9%, fever in 88%, and respiratory distress in 18.7% (25) and Altintas et al. (12) also found fever and cough followed by shortness of breath as the most common complaints. Our study's most common clinical symptoms were fever, cough, respiratory distress, and shortness of breath.

Limitations of our study, the data were obtained from a single clinical research center, not from more than one clinical research center. The result of this study may differ from the results of other scientists at home and abroad and should be further developed in clinical cases.

## CONCLUSION

This study showed that COVID-19 infection affected older people with comorbidity. The patients were commonly admitted with a complaint of fever, cough, and respiratory distress. Those who coughed were at higher risk of death due to the COVID-19, and the females were at a lower risk of mortality than the males. Those with respiratory distress symptoms were at a lower risk of mortality than those without respiratory distress symptoms. The older patients increased the mortality risk; those at higher risk of mortality had a more additional illness; those at higher risk of mortality had lower arrival complaints. The living patients had longer stay in the hospital, and the living patients had longer intensive care hospitalization. Dead patients used more medications than

living patients. It is essential to identify the characteristics of patients who died of or survived COVID-19 to take adequate preventive measures.

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**Ethical approval:** Local academic committee number 715 and the Turkish Republic dated 12.01.2021. All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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