



# Assessment of Demographic and Clinical Characteristics of COVID-19 Patients Hospitalized in Intensive Care Unit of Afzalipour Hospital, Kerman, 2020

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## Abstract

**Background:** Different types of coronaviruses, such as Middle East respiratory syndrome (MERS), severe acute respiratory syndrome (SARS), and COVID-19, cause different symptoms in individuals based on their clinical and demographic signatures, leading to either alleviation or exaggeration of the disease according to patients' characteristics. This cross-sectional study aimed to investigate the demographic and clinical characteristics of COVID-19 patients admitted to the intensive care unit (ICU) of Afzalipur hospital of Kerman.

**Methods:** This was a retrospective cross-sectional study in which we reviewed the medical files of COVID-19 patients admitted to the ICU of Afzalipur hospital, Kerman City, in 2019.

**Results:** Out of a total of 143 COVID-19 patients, 87 (60.8%) were men, and the mean  $\pm$  standard deviation of the age of the patients was  $56.9 \pm 22.7$  years. The most common symptoms were dyspnea (81.1% n = 116), fatigue (53.8%, n = 77), and dry cough (44.8%, n = 64). Lacrimation and pleuritic pain were observed in 3.5% (n = 5) of the patients.

**Conclusion:** Dyspnea and fatigue were the most common symptoms in COVID-19 patients at the beginning of the pandemic. Also, due to the relatively high mortality rate in our patients compared to other studies, there is a need for appropriate planning to cope with similar situations in the future.

**Keywords:** COVID-19, Intensive care unit, Iran

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## Introduction

In December 2019, a new type of coronavirus called COVID-19 was reported from Wuhan, China. The disease was transmissible from one person to another (1) and revealed a greater propagation scope compared to previous coronaviruses, imposing an estimated mortality rate of 3.4% (2). On the other hand, the disease inflicted a high burden on countries' healthcare sectors in terms of financial consequences and staggering costs, including diagnostic modalities, therapeutic interventions, prolonged hospitalizations, loss of human resources, emergence of psychological problems, etc. (3). The disease is associated with a significantly higher mortality rate in the elderly and those suffering from comorbidities compared to healthy people (4).

Ischemic patients are among the groups that are at

a higher risk for severe complications of COVID-19 and even COVID-related death compared to other patients. This group of patients with cardiac problems is considered among vulnerable groups and at risk of contracting COVID-19 and should always be under the close monitoring of a cardiologist for receiving suitable pharmaceutical and therapeutic regimens. Considering the spread of COVID-19 and the implementation of social distancing and home quarantine regulations to reduce the risks of contracting COVID-19, there is a dire need for delivering remote learning and monitoring measures to these patients by cardiologists (5,6).

After the global spread of COVID-19, it was declared a pandemic and a serious threat to global health and economy. The disease led to the hospitalization of a myriad of people in the intensive care units (ICUs) of hospitals



(7). Although the virus can infect people regardless of age, evidence shows that the elderly (>60 years old) and people suffering from certain comorbidities such as cardiovascular diseases, diabetes, chronic pulmonary diseases, and cancer are at an exaggerated risk for presenting a condition (8).

Among the established symptoms of COVID-19 patients are persistent fever, cough, and dyspnea; however, there is uncertainty regarding other extrapulmonary symptoms of the disease (9). Some observations indicate that many patients may present with symptoms such as diarrhea, anorexia, and nausea, revealing no respiratory symptoms at the disease onset (10,11). Acute respiratory distress syndrome and septic shock have been reported in severe cases (12). Although COVID-19 has shown a lower mortality rate than SARS and MERS, it has by far a higher transmission rate so that every infected individual can transmit the virus to 2.68 subjects on average (13).

According to previous studies, COVID-19 patients may present with variable symptoms depending on their clinical and demographic conditions, and some host's characteristics can actually modulate or exaggerate the severity of the disease. Therefore, it is necessary to identify these disease-modifying factors. The aim of the present study was to investigate the demographic and clinical characteristics of patients with COVID-19 admitted to the ICU of Afzalipur hospital in Kerman and their link to the final outcome of the disease (i.e., discharge from the hospital or death).

## Methods

This was a retrospective cross-sectional study on all COVID-19 patients admitted to the ICU of Afzalipur hospital of Kerman. A total of 143 patients were included in this study. Probable and definite COVID-19 cases were specified according to national guidelines (14). Patients' data, including age, gender, comorbidities, and clinical information (i.e., systolic blood pressure, diastolic blood pressure, respiratory rate, heart rate, blood oxygen saturation, and body temperature) were entered into a checklist.

The data were analyzed using descriptive statistics, including mean, standard deviation, frequency, and percentage. Analytical statistics were used for making comparisons. For quantitative data, the normality of the data was initially checked using the Kolmogorov-Smirnov test, and since the data did not possess normal distribution, the Mann-Whitney U test was chosen for data analysis. As well, the chi-square test and Fisher's exact test were utilized for analyzing categorical data. The significance level was considered  $P < 0.05$  for all tests, and data analysis was conducted in SPSS version 23 software.

## Results

A total of 143 patients with COVID-19 were admitted to

the ICU of Afzalipur hospital during the study period, of whom 60.8% ( $n = 87$ ) were men. The mean age  $\pm$  SD of the patients was  $56.89 \pm 22.71$  years with (an age range of 3 to 94 years) (Figure 1). In total, 74.8% ( $n = 107$ ) of the patients lost their lives.

The means of systolic and diastolic blood pressure of the patients were  $121.15 \pm 24.49$  and  $71.07 \pm 17.58$  mmHg, respectively. Also, the mean body temperature at the time of admittance to the ICU was  $37.46 \pm 1.18$  °C (Table 1).

The most common COVID-19 symptoms were dyspnea ( $n = 116$ , 81.1%), fatigue ( $n = 77$ , 53.8%), dry cough ( $n = 64$ , 44.8%), and sore throat and headache ( $n = 15$ , 10.5%). Other less common symptoms included diarrhea ( $n = 14$ , 9.8%), hemoptysis ( $n = 7$ , 4.9%), lacrimation, abdominal pain, respiration, and pleuritic pain ( $n = 5$ , 3.5%), nasal congestion ( $n = 3$ , 2.1%), and enlarged tonsils, wheezing, sound hoarseness, and runny nose ( $n = 2$ , 1.4%).

The most common comorbidities in these patients were hypertension ( $n = 38$ , 26.6%) and diabetes ( $n = 34$ , 23.8%) (Figure 2).

The mean duration of ICU hospitalization of the COVID-19 patients was  $23.60 \pm 6.60$  days (range: 1-35 days). On average, these patients were under mechanical ventilation for  $6.60 \pm 5.95$  days (range: 1-32 days). Most patients under mechanical ventilation ( $n = 119$ , 81%) were intubated. Our findings revealed no statistically significant relationship between the final outcome and either gender ( $P = 0.680$ ) or age ( $P = 0.060$ ) of the patients (Table 2).

## Discussion

The results of this study showed that most ICU-admitted COVID-19 patients were older people and men. Also, among COVID-19-related symptoms, shortness of breath was the most common symptom overall, and four out of five patients complained of this symptom. Death finally happened to nearly 75% of ICU-admitted COVID-19 patients, indicating patients' abysmal condition. Our results showed that >60% of COVID-19 patients hospitalized in the ICU were men, and the mean age of the patients was 56.89 years. The mean age of our patients

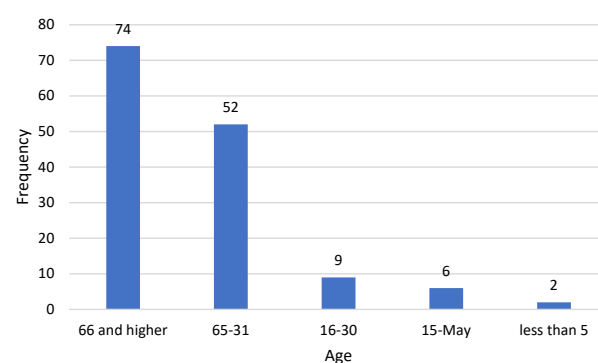
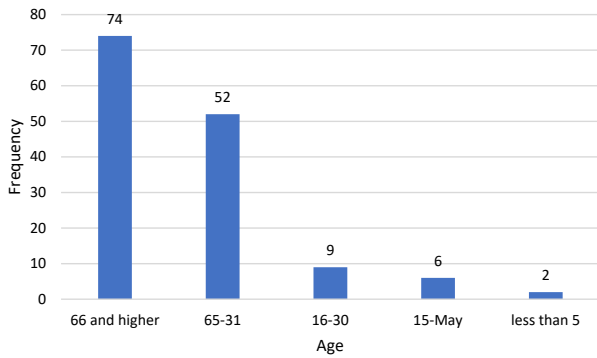


Figure 1. Age spectrum of COVID-19 patients admitted to the ICU of Afzalipur Hospital

**Table 1.** COVID-19 patients' vital signs at the time of admittance to the intensive care unit

Vital signs	Total number of patients	Mean ± SD	Minimum	Maximum
Systolic blood pressure	131	121.15 ± 49.24	70	190
Diastolic blood pressure	130	71.07 ± 17.58	10	98
Respiratory rate	124	21.86 ± 5.37	5	36
Heart rate	132	97.22 ± 20.00	35	145
O2 saturation	130	87.36 ± 12.06	30	100
Body temperature	132	37.46 ± 1.18	34.4	40



**Figure 2.** The frequency of various underlying diseases in COVID-19 patients hospitalized in the intensive care unit

was 10 years lower than that reported by Peykari et al (14), which can be due to the difference in the age distribution of the studied populations.

Among the patients studied here, dyspnea was the most common symptom, which was observed in more than 80% of the patients. Other symptoms such as fatigue and dry cough were observed in about 50% of the patients, and the least frequent clinical symptoms in our patients included sore throat and headache, which were noticed in 10% of the patients. Other symptoms included diarrhea, lacrimation, abdominal pain, respiration, and pleuritic pain, which were observed in a small fraction of the patients. A study in China demonstrated that the common presenting symptoms in COVID-19 patients were fever, dry cough, myalgia, fatigue, and dyspnea (15). Yang et al showed that COVID-19 patients often experienced mild symptoms mostly related to the upper respiratory tract, some of whom needed oxygen therapy (16). Also, patients commonly experienced gastrointestinal symptoms and elevated levels of liver enzymes (16).

Our results showed that only 31 patients (21.7%) suffered from no underlying diseases or a history of hospitalization due to chronic conditions. Among others, hypertension was named the most frequent comorbidity (n = 38 people), followed by diabetes (n = 34, 23.8%). The exacerbation of respiratory symptoms was the reason behind the hospitalization of all these patients in the ICU.

Based on our results, ICU-admitted COVID-19 patients were under mechanical ventilation for nearly 2 months on average, most frequently on intubation as the most common type of mechanical ventilation (n = 119, 81%). Overall, 75% of the patients died, and 24% were

**Table 2.** The relationship of disease outcome with the age and gender of COVID-19 patients admitted to the intensive care unit

Variables	Outcome		P
	Discharge	Death	
Age	23.06 ± 13.51	51.22 ± 58.85	0.060
Gender	Male	19 (22.4)	66 (77.6)
	Female	15 (26.8)	41 (73.2)

discharged from the hospital. Deceased patients had a significantly higher mean age compared to survivors, but no significant difference was observed in the mortality rate between men and women. Grasselli et al reported that most hospitalized COVID-19 patients were elder people, most of whom needed mechanical ventilation and a high level of positive end-expiratory pressure (PEEP), with an ICU mortality rate of 48.7% (17). The mortality rate in our study exceeded that reported in similar studies, which may be related to the high work burden of healthcare workers and limitations in providing care services to patients in Iran compared to Western countries.

This study comes with a number of limitations, including its cross-sectional designs, precluding from drawing a robust causal relationship. Also, we obtained our data by reviewing medical files, and some of these files were incomplete, so to address this problem, the researchers visited the ICU to gather additional information related to the patients who were still hospitalized.

**Conclusion**

The most common symptoms in our COVID-19 patients at the beginning of the pandemic were dyspnea and fatigue, so these symptoms should be kept in mind. Regarding the relatively high mortality rate in ICU-admitted COVID-19 patients observed in this study, health policymakers should appropriately plan to prepare medical staff so that they can show a better performance in emergency situations such as a pandemic in the future.

**Authors' Contribution**

**Conceptualization:** Morteza Hashemian, Soheil Mehmandoost, Naser Nasiri.

**Data curation:** Reza Raeesi, Alireza Karimi Nasab.

**Formal analysis:** Naser Nasiri.

**Investigation:** Morteza Hashemian, Soheil Mehmandoost, Naser Nasiri.

**Methodology:** Morteza Hashemian, Soheil Mehmandoost, Naser

Nasiri.

**Project administration:** Soheil Mehmandoost.

**Supervision:** Soheil Mehmandoost.

**Validation:** Morteza Hashemian, Naser Nasiri.

**Visualization:** Reza Raeesi, Alireza Karimi nasab.

**Writing–original draft:** Morteza Hashemian.

**Writing–review & editing:** Soheil Mehmandoost, Naser Nasiri, Reza Raeesi, Alireza Karimi Nasab.

### Competing Interests

None declared.

### Ethical Approval

This study received the necessary permissions from the Ethics Committee of Kerman University of Medical Sciences (ethics code: IR.KMU.AH.REC.1399.052). Data were gathered into data collection forms, including demographic features and clinical information (vital signs on admission, symptoms, diagnostic modalities, comorbidities, the reason for ICU hospitalization, duration of ICU hospitalization, and the final outcome).

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