


## Epidemiological and Clinical Characteristics of COVID-19 Patients Studied by Jiroft University of Medical Sciences: Southeast of Iran

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### ABSTRACT

**Background & Objective:** The behavior of COVID-19, clinical symptoms, and mortality rate are not the same in different regions. Due to lack of knowledge about the cited issues, we aimed to investigate the clinical symptoms, case fatality rate, and some risk factors of COVID-19.

**Materials & Methods:** This longitudinal study was started from the late February 2020 and lasted to the mid-July 2020 in Jiroft, Kerman province, Iran. The course of the disease, clinical signs and symptoms, underlying diseases, patients' exposure history, travel history, adherence to health instructions, and the fatality rate of the disease were evaluated in the patients. The descriptive statistics and frequency were analyzed in different groups using IBM SPSS statistics version 20.

**Results:** In this study, 2977 definitive cases of COVID-19 were detected using RT-PCR test. The frequent clinical symptoms were fever (45.2%), body aches and bruises (38.8%), and cough (36.4%), respectively. The fatality rate of the disease was 4%. Evaluation of the patients' exposure history showed that almost 50% of the cases had no exposure. Among the studied individuals, 33% had the history of exposure to a definite COVID-19 case.

**Conclusion:** Personal hygiene, social distancing, and use of face mask are of great importance in reducing the disease morbidity and mortality. Public awareness about COVID-19 should also be increased, especially in the elderly individuals with the history of underlying and chronic diseases.

**Keywords:** Coronavirus, COVID-19, Epidemiology, Mortality, Patient



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### Introduction

COVID-19 disease began in December 2019 in Wuhan, China (1). In a short time, the virus spread within China and between other countries (2). The virus has increased world concern because of its high transmission rate, as well as high mobility and mortality among humans (3). The World Health Organization (WHO) declared COVID-19 disease as a pandemic in March 2020 (4). In Islamic Republic of Iran, the first cases were reported in Qom on February 19, 2020; then it spread to other regions of the country, quickly (5). Today, the COVID-19 pandemic is one of

the most important public health issues in the country (6).

COVID-19 disease is caused by a new virus belonging to the family of Coronaviridae (genus of beta coronavirus) (7-9). Coronaviruses are a large family of viruses that can cause systemic infections in various animals, mainly respiratory infections such as acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) in humans (10, 11). The other end of coronavirus species spectrum is the common cold virus with relatively mild symptoms (12, 13).

COVID-19 disease is highly contagious and each infected person could infect at least three other people on average (14). Qifang *et al.* (2020) found that having an infected family member and traveling with an infected person increase the chance of morbidity (15).

The clinical signs of the disease begin after a period of almost 2.5 days, whereas the incubation period can extend to 14 days. Its duration depends on various factors, including the age and the immune system of the patient (16). The disease is classified into mild, moderate, severe, and critical (17, 18). The majority of COVID-19 cases are mild (17, 19). The most common symptoms are fever, fatigue, dry cough, and diarrhea (17, 20).

Some patients only indicate neurological symptoms as the initial symptoms, such as headache, languidness, unstable walking, malaise, cerebral hemorrhage, and cerebral infarction (20). Clinical studies have shown that the incidence of diarrhea ranges from 2-50% in patients (21).

Complications such as severe pneumonia, respiratory failure, acute respiratory distress syndrome (ARDS), heart damage and lymphopenia, sepsis and septic shock have been reported as fatal consequences (19, 22-24).

The disease has a mortality rate of approximately 7.5%. Elderly patients or those with chronic, cardiovascular and respiratory diseases are at higher risk of death (25). However, mortality rate varies from one country to another (14, 26-28). Considering the emergence of the disease and the lack of comprehensive knowledge about the behavior of the virus, our understanding of the clinical spectrum of COVID-19 infection is not yet complete. Moreover, different clinical symptoms and mortality rates have been reported in different regions (14, 17, 26, 29); therefore, we decided to identify clinical signs, case fatality rate, and some risk factors in COVID-19 patients diagnosed with RT-PCR.

## Materials and Methods

This study was a longitudinal study conducted on the population of the southern regions of Kerman province (about 700,000 people), who were monitored for 5 months from the late February 2020 to the mid-July 2020. As soon as the occurrence of new cases of COVID-19, all definitive cases were included in the study based on the diagnosis by RT-PCR.

The data were collected by a checklist prepared by the researchers, including demographic information, disease progression, patients' clinical signs, improved cases and deaths, underlying diseases, and patients' exposure history, comprising exposure to suspicious, probable, and definite cases. Moreover, the relation of new cases with definite cases, their travel history during 1-14 days before the appearance of the first signs of disease, and adherence to health instructions, as well as the disease lethality were assessed.

The collected data were entered into the software; they were analyzed using descriptive statistics and frequency in different groups using IBM SPSS statistics version 20.0 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). The following formula was used to calculate the lethality of COVID-19 disease (30). The case fatality rate was calculated as follows:

Case fatality (%): (No. of deaths due to disease during a specific period of time after disease onset or diagnosis) / (No. of confirmed cases with the specified disease)  $\times$  100

The Ethics Committee of Jiroft University of Medical Sciences, Kerman, Iran, approved this study (IR.JMU.REC.1399.001).

## Results

A number of 2977 positive cases were detected during the study, from which 1828 (61.4%) were outpatients and 1149 (38.6%) were hospitalized. The demographic variables are indicated in Table 1.

**Table 1. Demographic variables of patients with COVID-19 in southern Iran**

Gender	Absolute Frequency	Relative Frequency (%)
Male	1510	50.7
Female	1467	49.3
Sum	2977	100
Age Group		
<5	12	0.4
6-17	48	1.6
18-29	583	19.6
30-59	1721	57.8

Gender	Absolute Frequency	Relative Frequency (%)
>60	613	20.6
<b>Sum</b>	<b>2977</b>	<b>100</b>
<b>Education</b>		
Child	18	0.6
Illiterate	669	22.5
primary	323	10.8
Middle School	194	6.5
High School	70	2.4
Diploma	566	19
Associate Degree	194	6.5
Bachelor	726	24.4
M.s	180	6
Doctorate	37	1.2
<b>Sum</b>	<b>2977</b>	<b>100</b>
<b>Area of residence</b>		
Urban	1830	61.5
rural	1147	38.5
<b>Sum</b>	<b>2977</b>	<b>100</b>
<b>Job</b>		
Employee	1001	33.6
housewife	906	30.4
Farmer / rancher	282	9.5
Student	87	2.9
Driver	45	1.5
Seller	84	2.8
manual worker	92	3.1
Child	18	0.6
Unemployed / Retired	271	9.1
Freelance	191	6.4
<b>Sum</b>	<b>2977</b>	<b>100</b>

Among the studied population, the case fatality rate was equal to 4%. The most frequent clinical symptoms were fever (45.2%), body pain and contusion (38.8%), cough (36.4%), and headache (27.3%), respectively. The least found symptoms were confusion and irritability (3.9%), constipation (0.2%), and skin symptoms (0.0004%); other symptoms have been shown in [Figure 1](#).

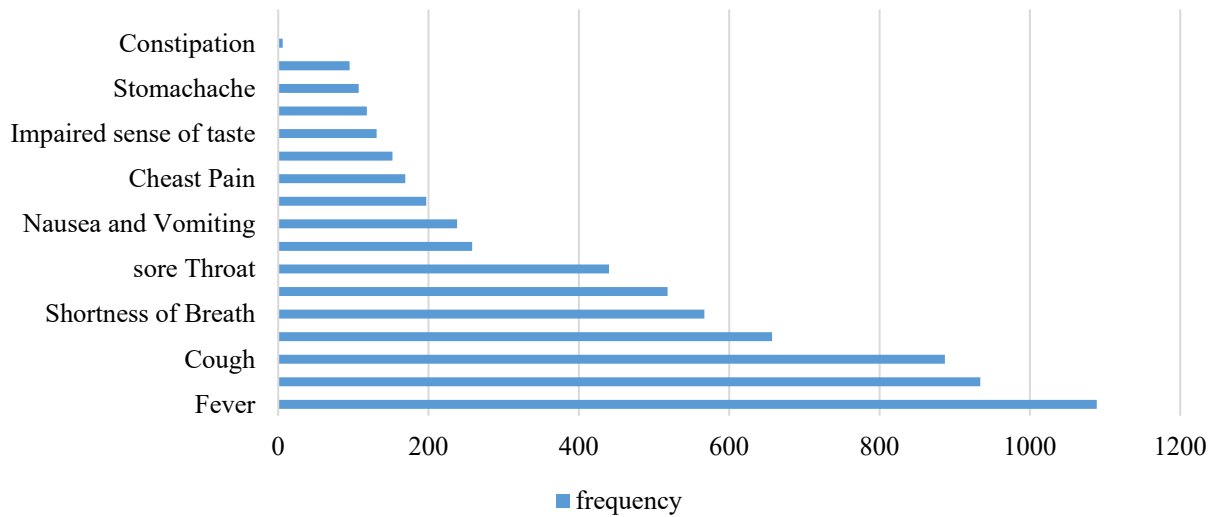
Among the fatalities, 27% had cardiovascular disease, followed by 16% with diabetes and respiratory diseases. Cancer, addiction, kidney and liver disorders, neurological and blood diseases, and immune deficiencies are also important in this regard ([Figure 2](#)).

In view of exposure history, approximately 50% of the cases had no exposure history and the rest had a history of exposure to definite cases (33%), probable cases (15%), and suspected cases (2%). The highest proportion of exposure was between family members, followed by friends, colleagues, and neighbors. Among all definite cases, 22% had no history of traveling and 78% had no history of traveling within the country; only 1% of cases had the history of traveling abroad.

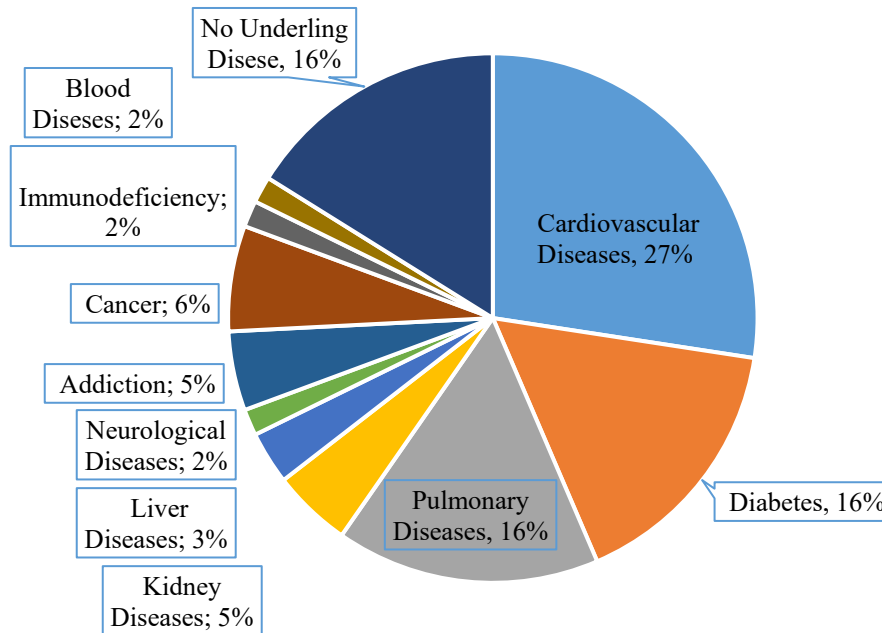
Considering the personal hygiene and social distancing among definite cases, 29%, 63%, and 8% were poor, good, and excellent, respectively. Thirteen percent of infected individuals were employed by

health care providers, and 31% had a history of referral to health care facilities within 14 days prior to the onset of symptoms. Among the total number of cases, 399 (16%) were health care personnel; the highest number

of cases were related to hospitals (54%), health centers (22%), public and private laboratories (9.1%), and public and private clinics (7.3%), respectively. The rest of patients were staffs of the university headquarters.



**Figure 1.** Frequency distribution of clinical symptoms caused by COVID-19, in the studied population



**Figure 2.** Frequency of underlying diseases among occurred deaths due to COVID-19.

**Discussion**

The present study evaluated the epidemiological characteristics, clinical signs, mortality rate, and some related risk factors of COVID-19 disease in Jiroft, Kerman province, Iran. According to the results of the present study, 50.7% of the cases were male and about 57.8 % of them were in the age range of 30- 59 years.

The study of Akbari *et al.* (2020) conducted in Shiraz city (southern Iran) showed that 56.6% of patients were male and 38.4% were in the age range of 40-60 years (4). In the study of Araban *et al.* (2020), which was conducted in Saveh city (Iran), the most cases were male and over 65 years (16). In 2020, Guan

*et al.* examined the demographic characteristics and clinical signs of patients with coronavirus infection in China; 58% of the patients were male and the mean age of the patients was 47 years (23). In another study in China, 54% of cases were male and 82% were under 60 (31). Based on the results, most affected people were men and women were less affected; this could be due to female sex hormones and the presence of the X chromosome which can be effective in this regard. Another reason could be higher rate of smoking among men (32).

Regarding the relationship between the age and cases of COVID-19, it can be asserted that older people are more likely to have underlying diseases and weaker immune system. In the study population, the case fatality rate of the disease was 4%, which was almost similar to the results of the study of Akbari *et al.* (2020) in Shiraz (3%) (4). The case fatality rate was 10.8% in Saveh (Iran) (16), which was more than the present study. In the study of Nikpouraghdam *et al.* in Tehran, the case fatality rate was 8% and 1.85% among hospitalized and non-hospitalized patients, respectively (14). The mortality rate of the disease varies in different provinces of Iran and also in different countries; it is 4.3% in China, 5-17% in Italy, and about 1% in South Korea and Germany (28, 31). Difference in mortality rate may be due to the racial differences and genetic backgrounds, socio-cultural behaviors, different health care, more experienced treatment staff, and more advanced hospital equipment.

According to the results of the present study, the most common clinical symptoms were fever (45.2%), body aches and bruises (38.8%), cough (36.4%), and headache (27.3%). Our findings were parallel to the results from another study in Iran, which reported cough in 44.5%, fever in 41.8%, and shortness of breath (dyspnea) in 40.1% of patients (16). However, in a study by Zhao *et al.* in China, a higher percentage of patients showed following symptoms: fever (82.4%), cough (64.8%), and fatigue (38.5%) (31). Therefore, fever, cough, dyspnea, and fatigue are common symptoms of the disease (33, 34); however, there are other symptoms such as gastrointestinal symptoms, heart attack, stroke, and kidney damage seen in some COVID-19 infected cases (35). In the present study, cardiovascular problems, diabetes, and respiratory diseases were seen among the fatalities.

In the study by Araban *et al.* (2020), half of all deaths occurred in people with underlying diseases. Hypertension, diabetes, and cardiovascular diseases were considered as important risk factors for COVID-19; they were significantly associated with mortality (16). One study found that diabetes, respiratory disease, hypertension, and cardiovascular disease increase the risk of death in people with COVID-19 (14). Based on the results of the present study, in reviewing the exposure history of patients with COVID-19, 33% had close contact with a definite case of disease. The

highest proportion was between family members, followed by friends, colleagues, and neighbors.

Among all cases, 22% had the history of travel. Twenty-nine percent of definite cases had poor personal hygiene and social distancing. Thirty-one percent of cases had the history of referring to health centers during the 14 days before the onset of symptoms. Therefore, preventive strategies such as using a mask, washing hands regularly with water and soap or using alcohol-containing solutions, and educating people should be considered (36). Social distancing (at least 6 feet), avoiding close contact with people, and avoiding gatherings can be effective in controlling the disease (37).

## Conclusion

Patients with COVID-19 experience a wide range of clinical symptoms, and not a definite or specific symptom has been recognized for the disease. People with underlying, chronic, cardiovascular and respiratory diseases, and the elderly people are high-risk individuals. Considering different routes of transmission (direct contact with an infected person and respiratory transmission), the best way to deal with the disease is to follow personal hygiene practices and observe social distancing rules, as well as using mask. Moreover, it is important to educate and raise public awareness about this disease in order to reduce its morbidity and mortality especially in the elderly people with a history of underlying and chronic diseases.

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## Conflict of Interest

The authors declared that they have no conflicts of interest.

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