The Epidemiological Study of Covid-19 and Risk Factors: A Review Study

Abstract:
At the end of 2019, several cases of pneumonia of unknown cause appeared in Wuhan, Hubei Province, China, which quickly spread to other provinces. In the early stages, it was reported that most patients had a history of contact with Huan seafood. Patients were more likely to have a fever and cough symptoms. The spread of SARS-CoV-2 was very rapid. WHO has declared its prevalence as a public health emergency of international concern. On February 11, 2020, the International Committee for the Classification of Viruses renamed the virus "Acute Respiratory Syndrome of Coronavirus-2 (SARSCoV-2) and WHO SARS-CoV-2 Disease as Coronavirus 2019" (Covid-19) Declared an epidemic. The present study is a PICO review study that Epidemiological study of Covid-19 and risk factors. The browsing documents searched in the Google Scholar, Sid and Mag Iran databases were analyzed using the keywords epidemic, covid-19, risk factors. The COVID-19 epidemic has spread very rapidly to several countries, including European countries, Asian countries, the United States, and so on. Most countries, especially developing countries, expanded.

Keywords: epidemic, covid-19, risk factors

Introduction
At the end of 2019, several cases of pneumonia of unknown cause appeared in Wuhan, Hubei Province, China. Pneumonia quickly spread to other provinces. In the early stages, it was reported that most patients had a history of contact with Huan seafood. After that, patients became more and more feverish and had coughing symptoms. On January 7, 2020, a new coronavirus was detected in a swab throat sample of a patient by the Chinese Centers for Disease Control, and it was named the new covid-19 virus by the World Health Organization (WHO) (1-3).

As the situation worsened, the WHO declared its prevalence as a public health emergency of international concern (4). On February 11, 2020, the International Committee for Classification of Viruses renamed the virus to Acute Respiratory Syndrome of Coronavirus-2 (SARSCoV-2) (5) and WHO SARS-CoV-2 Disease as Coronavirus 2019 (Covid-19) declared an epidemic (6).

With the outbreak of COVID-19, the Chinese government has launched a Level 1 public health response to prevent its spread. The prevalence of COVID19 in Wuhan is currently speculated to be related to wildlife. According to the WHO, environmental samples taken from Hwanan seafood have been marketed positive for SARS-CoV-2 (7), but no specific animals associated with the virus have been identified. Based on previous evidence, bats are more hostile (30 coronaviruses) and may be
the source of COVID-19 (8). In the case of intermediate hosts SARS-CoV-2, recent studies suggest that pangolins are potential animals. Two subtypes of SARS-CoV-2 were found in pangolin-derived organs (9).

In the epidemiological and etiological investigation of the authorities, it all started like this: On December 27, 2019, three adult patients were admitted to a hospital in Wuhan showing symptoms of severe pneumonia. Among the patients, a 49-year-old woman (a seafood retailer) had no chronic illness and condition, and on December 23, 2019, she reported fever and cough with chest discomfort. After four days, his cough and chest discomfort worsened, but the fever subsided and he was released on January 16, 2020, a 61-year-old man (a frequent visitor to the seafood market) who reported coughing and fever on December 20, 2019. He suffered from respiratory distress 7 days after the onset of the disease and died on January 9, 2020, and a 32-year-old man who recovered after treatment and was discharged (10).

In this review study, we review other studies in terms of epidemiology and prevalence of COVID-19 and the factors affecting the disease.

Method
This article is based on a review study and is based on observation and documentation. The first part was based on library studies and Internet searches on Web of Science, PubMed Scopus, Google Scholar, Direct Science, and Advanced Google. Articles on the World Health Organization and the US CDC were also reviewed.

Findings
Data reported by CET on March 3, 2020, SARS-CoV-2 responsible for 90,870 approved by 3112 deaths worldwide (11). The mean reported age of patients was 41 to 57 years and men make up the majority of patients with a ratio of 50-75% (12-14).

Approximately 25.2-50.5% of patients with SARS-CoV-2 had one or more underlying diseases, including hypertension, diabetes, chronic obstructive pulmonary disease, cardiovascular disease, and malignancy. The median period of COVID-193.0 days exposure was 1,099 in one group and 62 days in a 62-day group. The longest period was also reported to be 24 days (15 , 16).

The number of primary reproductions (R0), an important property of disease transmission, is commonly used to estimate the mean (17, 18). If R0 is greater than 1, human-to-human transmission may continue. An amplitude of 1.4 to 6.49 of R0 was estimated by different methods (19, 20). Liu et al. After analyzing 12 studies, concluded that the mean estimate of R0 was 3.28 with an average of
2.79. Thus, about 2-3 is actually a reliable range, which indicates the possibility of a stable human-to-human transmission (21). In addition, many factors can affect the value of R0, and the estimated R0 can be changed. The initial R0 estimate for SARS-CoV was more than 2.0, but the large outbreak predicted did not occur. It is also noteworthy that asymptomatic patients can also be a source of infection (22,23).

The Scientific Media Project (www.dontforgetthebubbles.com) reviewed an extensive analysis of scientific articles on SARS-CoV-2 or COVID19 infection in children. As of March 27, 2020, it has been determined that children will be infected and boys will be slightly more likely to become ill. It is usually asymptomatic in children or has minimal subclinical symptoms. Out of 10 sick children, fever symptom was found in about 6 and sore throat in 4 cases and rhinorrhea (runny nose, stuffy nose), gastrointestinal disorders were found in about one case. Often, children have a fever for 2-4 days, although in some cases it may be a week or more (24-26).

Laboratory data showed that COVID-19 infection appeared differently in children compared to adults. The clinical picture in children is not clear and integrated. Decreased blood lymphocyte concentrations are rare. Often, normal or slightly elevated blood lymphocyte concentrations, as well as nonspecific inflammatory markers such as CRP and procalcitonin, are often slightly elevated, and transaminases (ALT and AST) are slightly elevated in the liver (27, 28).

Since the beginning of the coronavirus in the People's Republic of China (PRC) and as of January 30, 2020, 15,238 people have been infected in 31 PRC provinces. In 9692 patients, it was confirmed that 1527 patients had severe disease and 213 died. At the same time, 28 cases (0.18%) of new infections were recorded among children from birth to 17 years of age (29).

Certainly the epidemic in China had a significant impact. More people were confirmed by the end of March, more than 81,500, and had 3,300 deaths, 583,000 and 383,000 deaths worldwide, respectively (30).

According to official statistics, as of April 5, 662 cases of COVID-19 infection were registered in Kazakhstan, of which 45 were children (6.7 ± 0.09), 46 recovered (6.9 9 9.09) and 6 patients died (0.009 9 0.003) (31-34).

In the newborn group up to 9 years, no fatalities have been recorded yet. In Spain, one child died in an analysis of 221 cases between the ages of 10 and 19. In China, a 14-year-old boy died in the first week of February in Hubei Province. To date, the most extensive data has been received from China. Data of 2143 clinical cases in China containing 731 laboratory cases have been confirmed. More than 50 women became infected with COVID19 while giving birth. In some of the above cases, COVID19 was detected in newborns (35).
The role of children in the spread of infection is not known, but it seems to be low, but children may be carriers of the virus without, or with minimal, manifestations of infection (36).

Relatively few cases of COVID-19 due to SARS-CoV-2 infection have been reported in children. The total number of cases reported in the general population since February 20, 2020, 2.4% of the 75,465 confirmed and suspected cases in China, occurred in persons under 19 years of age. An analysis conducted in a large city in southern China shows that among all cases of the disease, the proportion of children under the age of 15 from the beginning to the end of the epidemic may have increased from 2% to 13% (37).

Most infected people were in the age group of 35-55 years, although the elderly were 89 years old. Most men (59%) were infected. It was also found that older people are more at risk, which may be due to a weakened immune system, and that people with immunodeficiency, such as those with underlying diseases such as kidney or liver problems, were also at risk. The first reported death due to SARS-CoV-2 from China was on January 10, 2020. By this time, the infection had spread to hundreds of people in various Chinese cities (38).

The spread of SARS-CoV-2 was very rapid. As of January 30, 2020, there were 9976 reports. As of January 31, 2020, the virus had spread to many countries, affecting 11,791 people and killing 213. As of February 16, 2020, there were 70,548 confirmed cases in China and 683 in other countries. On March 9, 2020, countries reported 109,577 cases of COVID-19, with China having the highest at 80,904. Apart from China, the other countries with the main cases were South Korea (7382 cases), Italy (7375 cases) and Iran (6566 cases). As of March 30, 2020, the number of cases from 177 countries worldwide reached 723,328. With 143,025 positives, the United States topped the table, followed by Italy (97689) and China (82152). As of April 1, 2020, there were 857,957 confirmed cases worldwide, affecting 180 countries, with the most positive cases in the United States (188,547).

On April 20, 2020, the global number of 2,402,798 cases was confirmed with the highest number of cases in the United States, followed by Spain and Italy, and the epidemic spread to 185 countries (39-41).

In addition, 835 confirmed cases have been reported as of January 24, 2020. In Wuhan, where 25 patients died and by January 26, 2020, another 62 patients (19 to 65 years old) were hospitalized in Zhejiang. All of these observations imply the rapid spread of COVID-19 through early human-to-human transmission (1,42).

COVID-19 initially spread to other Asian countries outside of China. Cases have been reported from countries such as Thailand, Japan, South Korea, Malaysia and Singapore(43).
On January 13, 2020, the first positive case of SARS-CoV-2 outside China was reported from Thailand. The patient has no history of visiting the seafood wholesale market in Huanan, China. In addition, on January 15 and January 20, 2020, the first positive cases were reported from Japan and Korea, respectively (44).

COVID-19 cases began in December 2019 in Wuhan, China, and reached Europe in mid-January, with the first case of SARS-CoV-2 reported from France. The first of five patients in France was diagnosed with SARS-CoV-2 infection on January 24, 2020 (15). Five patients, all of Chinese descent, were admitted to two different hospitals in Paris, France. The patients consisted of 3 men (age: 31, 48 and 80 years) and 2 women (age: 30 and 40 years). All of them had traveled from China to France since mid-January. He died of the disease while the other patients recovered and were discharged from the hospital by 19 February 2020 (45).

As of February 21, 2020, there are 47 positive cases of COVID-19 confirmation in the European region, namely France (12), Germany (16 cases), Belgium (1), Finland (1), Italy (3), Spain (2), Russia (2), Sweden (1) and the United Kingdom (Case 9) (15). As of March 6, 2020, there were 5,544 cases of COVID-19 and 159 deaths in the EU and the UK (46). Of all the European countries, Italy suffered the most. As of March 11, 2020, Italy had 12,462 confirmed cases and 827 deaths (47). Many people with SARS-CoV-2 were asymptomatic but infected. As of March 19, 2020, there were 427 deaths in 24 hours in Italy alone. By March 23, 2020, the reported death toll from Italy had reached 3,405, more than 3,245 from China. Thus, Italy was recognized as the worst country with COVID-19 in the world. The prevalence of COVID-19 in the EU and the UK from February 21, 2020 to April 19, 2020 is very fast and mortality has increased (48).

![Cumulative infected data from the top ten highly infected countries.](image)
Fig. 2. Power index obtained from different models for top ten highly infected countries.

Fig. 3. Daily infected data from the top ten highly infected countries.

Fig. 4. Normalized cumulative data of top ten highly infected countries.
Various factors affect the prevalence, including transmission and severity of morbidity and mortality. A combination of transmissibility and intensity and rapid person-to-person transmission has occurred in this outbreak. Epidemiologists estimated the RO (initial reproduction number) to measure transferability to be 2.2 for Covid-19 (3).

Since the virus was discovered, Covid-19 has spread rapidly across the country, and cases have been reported in 210 surrounding countries, with more than 2.4 million confirmed data. Lower mortality rates were 0.17% in Qatar, 0.2% in Singapore, 0.6% in the UAE, and 0.97% in Australia. The recovery-to-death ratio was calculated, and data showed that recovery in Singapore (68), Qatar (59) and Thailand (35) was higher than death. Less than the recovery rate of the deceased was found in United (0.03), the Netherlands (0.08), Ireland (0.16) and Norway (0.21) (49).

One study evaluated the epidemiological risk factors for the transmission of Covid-19 virus during a recent global outbreak. Several studies published in a short period of time have suggested the importance of selected factors such as temperature and stability of SARS-CoV-2 in the air and the importance of social distance measures, which prioritize them as an important factor in controlling the prevalence of COVID-19 in the community. Is. This study identified 11 factors influencing the epidemic. The TISM approach was used to list the factors influencing the epidemic. The factors were ranked and the order of importance and hierarchy was established. The results of the study show that
changes in each individual factor mentioned in the study can directly or indirectly affect. Viral spread of social distance and community awareness, age, air temperature, air flow and ventilation, population density and air humidity are known as the main factors in this model. These factors independently and interdependently had a great impact on the epidemic. Characteristics of SARS-CoV-2. Host behavior and number of contacts and personal hygiene measures were identified as the link between the above. Thus, effective linkage management can effectively control the spread of COVID-19.

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<td>Personal hygiene practices (F10)</td>
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<td>Humidity (F11)</td>
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Fig.6.The selected factors influencing the epidemiological characteristic of covid-19.

**Conclusion**

COVID-19 epidemic has spread very rapidly. COVID-19 from SARS-CoV-2 originated in Wuhan, China and is now a pandemic. The origin of this disease is still unknown. The disease is transmitted from person to person mainly by cough drops or sneezes or direct contact with several countries, including European countries, Asian countries, the United States and so on. Most countries, especially developing countries, expanded. Fever and cough are the main symptoms. Confirmed cases are on the rise in other countries, such as Korea and Japan, so the disease needs to be controlled.

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