



Journal of Acute Disease

Original Article



jadweb.org

doi: 10.4103/jad.jad_30_24

Impact Factor® 0.5

Survival and risk analysis of patients with COVID–19 in Iran

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ABSTRACT

Objective: To evaluate the risk factors of death caused by COVID-19 in Iran.

Methods: This study was a retrospective cohort study from February 20, 2020, to August 22, 2022, in the hospitals in Isfahan, Iran. The data were collected through a researcher-made checklist. To determine the risk factors of the death, logistic regression and Cox regression models were used. For each variable, the odds ratio and 95% confidence interval were also reported.

Results: 1 885 Patients were included. The age of deceased persons was significantly higher than that of the surviving persons. The risk of death for the age group above 60 years was about 14 times higher than that of people aged 19-35 years [95%CI: 14.41 (2.02-102.99), $P<0.01$]. Hypertension [95%CI: 1.92 (1.47-2.5), $P<0.01$], diabetes [95%CI: 1.62 (1.23-2.13), $P<0.001$], and chronic obstructive pulmonary disease [95%CI: 1.92 (1.47-2.50), $P<0.01$] were also risk factors of mortality.

Conclusions: This study reveals that the mortality rate due to COVID-19 is associated with old age, longer hospitalization in the ICU, increased length of stay, and comorbidities of high blood pressure, diabetes, and chronic pulmonary disease.

KEYWORDS: Cause; Death; Survival; COVID-19; Risk factors; Iran

1. Introduction

In March 2020, the World Health Organization officially announced COVID-19 as a pandemic[1,2]. With the spread of the epidemic, 231 countries started releasing reports on cases and deaths daily so over 700 million confirmed cases and nearly seven million deaths were reported worldwide by December 23, 2023[3]. According to the Worldometer, the reliable reference website

Significance

Considering the global epidemic of COVID-19, this study was conducted to identify the risk factors of survival. This study reveals that the mortality rate due to COVID-19 is associated with old age, longer hospitalization in the ICU, increased length of stay, and comorbidities of high blood pressure, diabetes, and chronic pulmonary disease.

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How to cite this article: Mottaghipoor F, Heidari Z, Sami R, Memarzadeh H, Saghaeiannejad Isfahani S. Survival and risk analysis of patients with COVID-19 in Iran. J Acute Dis 2024; 13(2): 60-66.

Article history: Received 22 February 2024; Revision 19 March 2024; Accepted 26 April 2024; Available online 7 May 2024

study indicates that high blood pressure and diabetes are positively linked with the risk of death. Logistic regression analysis shows the odds of death from COVID-19 are 3 times and 2 times higher than that of patients without high blood pressure, respectively. Survival analysis shows that comparing the diabetic and non-diabetic patients, the risk of death from COVID-19 is 2 times and 1.6 times higher, respectively. These findings are similar to Rafati *et al.*'s study, which concluded that diabetic patients had a 1.62 times increased risk of mortality than the non-diabetic cases[27].

Given the findings of this study, as the age of patients increases- especially the patients diagnosed with comorbidities, such as high blood pressure, diabetes, and chronic pulmonary disease- they tend to become more vulnerable to infectious diseases and acute respiratory syndrome and have higher mortality from COVID-19. This may be mainly due to their poorer physical condition and weaker immune system. Accordingly, it is important to prevent infection among individuals at high risk to reduce COVID-19-related mortality. Further, as was observed in this study, the most frequent clinical symptoms were fever, shortness of breath, weakness and lethargy, cough, high breathing rate, hypoxemia, high heart rate, and high systolic blood pressure. These findings can be helpful in the identification and prognosis of patients with COVID-19 during the initial examinations or upon their arrival at the hospital.

Conflict of interest statement

The authors report no conflict of interest.

Funding

This study received no extramural funding.

Data availability statement

The data supporting the findings of this study are available from the corresponding authors upon request.

Authors' contributions

FM wrote the manuscript, acquired data, created the dataset, and revised the final version of the manuscript. SSI and RS wrote the manuscript. SSI analyzed and interpreted data, designed the study, and revised the final version of the manuscript. ZH performed statistical analyses and revised the article. HM acquired data.

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Edited by Tan BJ, Chen SR